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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING AND IRRIGATION
EDWARD HYATT, State Engineer

BULLETIN No. 14

ALEXANDER

The Control of Floods by Reservoirs

By
PAUL BAILEY

AN APPENDIX
to the
SUMMARY REPORT
TO THE LEGISLATURE OF 1927
on the
WATER RESOURCES OF CALIFORNIA
and a
Coordinated Plan for Their Development

CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO, 1928

52411

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FOREWORD.

This bulletin is one of a series appended to the "Summary Report on the Water Resources of California and a Coordinated Plan for their Development" that was presented to the Legislature of 1927. It is part of the investigation of the water resources of the state commenced in 1921. This investigation has comprised a survey of water supplies and flood flows throughout the state, a determination of their characteristics, an estimate of the present and future needs for water, and the formulation of a comprehensive and coordinated plan for future development in order to insure adequate water supplies for all purposes. The 1927 report concludes this investigation. The entire series of bulletins pertaining to the 1927 report are:

Bul. 12—"Summary Report on the Water Resources of California and a Coordinated Plan for their Development." (A report to the Legislature of 1927.)
Bul. 13—"The Development of the Upper Sacramento River."
Bul. 14—"THE CONTROL OF FLOODS BY RESERVOIRS."
Bul. 15—"The Coordinated Plan of Water Development in the Sacramento Valley."
Bul. 16—"The Coordinated Plan of Water Development in the San Joaquin Valley."
Bul. 17—"The Coordinated Plan of Water Development in Southern California."

Other bulletins pertaining to these investigations published prior to the 1927 report are:

Bul. 4—"Water Resources of California." (A report to the Legislature of 1923 on the first two years of investigation.)
Bul. 5—"Flow in California Streams."
Bul. 6—"Water Requirements of California Lands."
Bul. 9—"A Supplemental Report on the Water Resources of California." (A report to the Legislature of 1925.)
Bul. 11—"Ground Water Resources of the Southern San Joaquin Valley."

The first appropriation for the investigation of the water resources of California was made by Chapter 889 of the 1921 Statutes, in the amount of $200,000. This resulted in the publication of Bulletins Nos. 4, 5, and 6. These contain a complete inventory of all the waters within the State's boundaries, an estimate of the future needs of water for all purposes, and a preliminary comprehensive plan for ultimate development that will secure the greatest public service from the State's limited water supply.

No provision was made for the continuance of the investigations by the 1923 legislature but at the urgent request of the farmers of the southern San Joaquin Valley, the Chambers of Commerce of San Francisco and Los Angeles advanced $90,000 for the study of a first unit

of the comprehensive plan that would relieve the stress in a section of the State most in need of an imported water supply. With this money, works were planned that would transport the surplus waters of the Sacramento drainage basin into the San Joaquin Valley and make a new supply available for the southern half of the valley. An account of this work is published in Bulletin No. 9, a report to the Legislature of 1925.

Chapter 477 of the 1925 Statutes made $150,000 available to the Division for completion of the work. This money was spent in perfecting the "Coordinated Plan" of development requested in the appropriation bill. Heretofore, in looking to the future, the problems of flood control and of conservation have been given separate consideration. Expensive construction programs are known to be necessary in both fields of endeavor to provide habitable conditions for the increasing population. The investigation of the possibility of coordinating these two necessary programs has assumed such large proportions that this entire volume has been given over to the presentation of this phase of the "Water Resources Investigation."

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CHAPTER I.

OPPORTUNITY FOR CONTROLLING FLOODS BY RESERVOIRS.

Past consideration given to control of floods by reservoirs.

The control of floods by reservoirs has been regarded in the past, generally, as an uneconomic system of protection. However, knowledge of reservoir sites in California and of the extent to which they will have to be employed in order that the State's latent resources may be utilized, is comparatively recent. The report of the Conservation Commission* of 1912, although mentioning the necessity of storage, does not list more than a couple of dozen reservoir sites. Not until the water resources investigations were initiated in 1921 has there been general public knowledge of the part reservoirs will play in the future development of this state. It has been pointed out in this work, that a construction program adequate for the State's potentialities will eventually total 50,000,000 acre-feet or more of reservoir capacity. This will involve the construction of several hundred large reservoirs. More than a thousand sites are now known to exist, more than will be required for a complete development of available waters.

Such study as has been given previously to the control of floods by reservoirs indicates that their cost, when constructed for flood control purposes alone, exceeds so far the cost of equivalent protection by leveed channels and by-passes, that only in instances of unusually cheap construction or in the vicinity of metropolitan areas of high property values, can reservoirs be utilized for flood control purposes. In all these studies, either the entire space in the reservoir or some fraction of it, has been allotted to flood control for use only in the temporary detention of flood flows and to be held empty at all times other than during large floods. Under this mode of operation, the entire cost of the storage space allotted to flood control is chargeable to the protective system. Because this required space is large on important streams, the cost of flood control by reservoirs usually has been found prohibitive. The only instances of reservoir construction for flood control purposes in California are the current undertakings of the Los Angeles County Flood Control District and of the City of Stockton. In both of these instances bonds have been voted. Several reservoirs have been constructed by the Los Angeles District.

It has been considered by some, without much study, that the construction of large reservoirs for irrigation and power purposes will diminish the size of floods. A careful analysis, however, discloses that, unless these reservoirs are operated especially for flood control purposes, they are apt to be fairly well filled upon the arrival of large floods, because large floods do not occur in seasons of small run-off. While they may absorb many medium and small floods, dependence can not be placed upon their absorption of large floods. Therefore the vast program of reservoir construction that will be necessary for domestic supply, irrigation and power, has no particular bearing upon flood

* The State Conservation Commission was appointed in 1911 to investigate and report, among other things, on water, the use of water, water power, irrigation and reclamation.

control, unless a special program is devised for its employment for this purpose.

That the engineering profession has held the belief that reservoirs would come into more general use in controlling floods, is shown by the report of the California Debris Commission of June 29, 1911. The report of this commission is one of the most extended studies of flood control that has been made in California. The plan of leveed channels and by-passes for carrying off maximum flood flows proposed in this report was adopted by both the California Legislature and the National Congress and is being followed in reclaiming a million acres of overflow land in the Sacramento Valley. The works are now two-thirds complete. In planning and recommending the construction of these works, consideration was given by the California Debris Commission to the reduction of floods by reservoirs. Its conclusions were expressed in the 1911 report as follows:

> "While favoring the use of reservoirs as far as possible, and considering that one of the advantages of the project herein proposed is that it lends itself to future storage possibilities, the commission believes that it is not economical to construct reservoirs for flood control, but that such construction should be deferred until these reservoirs prove desirable for power and irrigation purposes."

Future conditions favorable for use of reservoirs in controlling floods.

The time has arrived when reservoir construction is necessary for both power and irrigation purposes. California now stands with a full measure of development of the summer flow in its streams. Further progress involves the storage of winter and spring storm water and its retention for summer use. The employment of these reservoirs for flood control, that necessarily will be constructed in succeeding years for irrigation, power and domestic supplies, is a matter of great public interest. Its accomplishment would be of inestimable public benefit. The water resources investigation, therefore, has undertaken the intensive study of the problem of how flood control might benefit from the construction of reservoirs for other purposes.

The attempt to use reservoirs for both flood control and conservation seems at first like a contradictory effort. To be useful for regulating floods, reservoirs should be held empty during the period of heavy run-off in order to be able to absorb an excessive flood flow if it should occur, while for conservation purposes, they should be allowed to fill during this same period in order that the run-off season may end with a full reservoir. However, a detailed analysis of the time of occurrence and volume of flood flows discloses a procedure for filling reservoirs that will hold in reserve sufficient capacity to absorb floods during the time in which they are likely to occur, and progressively release this space for filling as the end of the flood season approaches. This bulletin is devoted to the presentation of these matters.

Physical opportunity to combine conservation and flood control in same reservoir.

That a combination program of conservation and flood control should be possible seems evident from an examination of the hydrographs of California streams. This discloses that excessive rates of flood flow are of comparatively short duration, that they occur in the middle or fore

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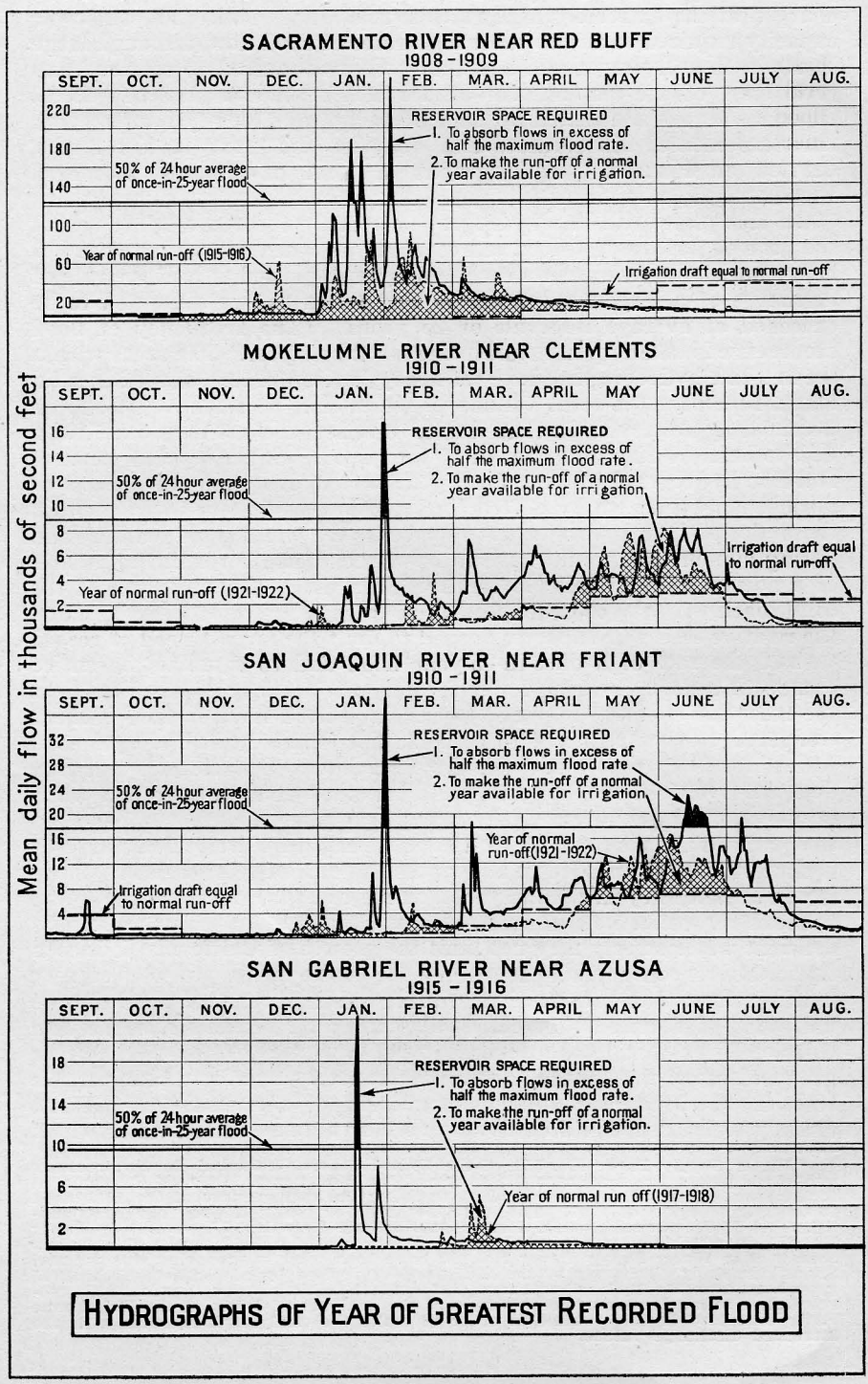
part of the period of heavy run-off, and that the volume of water discharged at the extremely high rates is relatively small. The reservoir capacity required to absorb these high rates of flood flow, although large in itself, is still very much less than will be required to equalize any great part of the seasonal run-off for irrigation use. These general observations are illustrated by the hydrographs of four typical streams, the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers, drafted on Plate I, "Hydrographs of Year of Greatest Recorded Flood."*

On this plate, full-line hydrographs portray the run-off throughout the year of the greatest flood on record on each of the four streams. A heavy horizontal line crosses each hydrograph plotted at half the rate of discharge of a large flood which is here taken as one estimated to be exceeded at average intervals of 25 years. (The frequency of flood occurrence is taken up in detail in the second chapter.) The areas within the full-line hydrographs above the heavy horizontal line, shaded in solid black, represent the total volume of water that would have had to be detained by reservoirs in that season in order to limit the downstream flow to half the rate of a once-in-25-year flood. Superimposed on these full-line hydrographs of the flood years are hydrographs of seasons of normal run-off shown by dotted lines. The cross-hatched areas within these dotted-line hydrographs represent the volume of winter and spring run-off that would have to be stored to make the entire run-off of a normal season available for irrigation use. A comparison of the solid black with the cross-hatched area on each figure of Plate I, shows the relative reservoir capacity needed to limit the largest flood of record to half the rate of a once-in-25-year flood and to equalize the entire run-off of a normal season for irrigation use. It may be observed that the reservoir capacity required to cut large flood flows in half is small compared to that required to equalize the entire run-off of a normal season for irrigation use. On the Sacramento, Mokelumne and San Joaquin rivers the one is from 5 to 15 times larger than the other, while on the San Gabriel, a very flashy stream, the reservoir capacity required to equalize the entire run-off of a normal season for irrigation purposes is about twice that needed to absorb the top half of a large flood. Since it will be necessary in coming years, on most of the streams of the State, to make the entire flow of normal years available for use in order that deficient water supply may not limit the growth of California, it is seen that the reservoir capacity necessary for conservation purposes is very much greater than that needed to limit the high rates of flood flow to half that of a once-in-25-year flood, except on streams like the San Gabriel River that have exceedingly flashy run-off. Any reservoir or group of reservoirs that have sufficient capacity to store a considerable fraction of the winter and spring run-off of a normal year, if not already well filled, could easily absorb the volume of flood water which

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

PLATE I.


SACRAMENTO RIVER NEAR RED BLUFF
1908 - 1909
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
220
180
140
100
60
20
RESERVOIR SPACE REQUIRED
1. To absorb flows in excess of half the maximum flood rate.
2. To make the run-off of a normal year available for irrigation.
50% of 24 hour average of once-in-25-year flood
Year of normal run-off (1915-1916)
Irrigation draft equal to normal run-off
MOKELUMNE RIVER NEAR CLEMENTS
1910 - 1911
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
16
14
12
10
8
6
4
2
RESERVOIR SPACE REQUIRED
1. To absorb flows in excess of half the maximum flood rate.
2. To make the run-off of a normal year available for irrigation.
50% of 24 hour average of once-in-25-year flood
Year of normal run-off (1921-1922)
Irrigation draft equal to normal run-off
Mean daily flow in thousands of second feet
SAN JOAQUIN RIVER NEAR FRIANT
1910 - 1911
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
32
28
24
20
16
12
8
4
RESERVOIR SPACE REQUIRED
1. To absorb flows in excess of half the maximum flood rate
2. To make the run-off of a normal year available for irrigation.
50% of 24 hour average of once-in-25-year flood
Year of normal run-off (1921-1922)
Irrigation draft equal to normal run-off
SAN GABRIEL RIVER NEAR AZUSA
1915 - 1916
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
18
14
10
6
2
RESERVOIR SPACE REQUIRED
1. To absorb flows in excess of half the maximum flood rate.
2. To make the run-off of a normal year available for irrigation.
50% of 24 hour average of once-in-25-year flood
Year of normal run off (1917-1918)
HYDROGRAPHS OF YEAR OF GREATEST RECORDED FLOOD

otherwise would be discharged at rates in excess of half that of a once-in-25-year flood.

Although the volume of flood water discharged at rates in excess of half that of a large flood is relatively small, an inspection of the general shape of the hydrographs on Plate I reveals that the volume of flood water discharging at rates less than half that of a large flood increases quite rapidly with the lower rates of discharge. This is indicated by the increasingly greater widths of the peaks on the hydrographs as they descend below the heavy horizontal lines drawn at rates half that of a once-in-25-year flood. At about the quarter points, except on the San Gabriel River, these peaks merge more or less into one another on account of their increasing width. This greater width of the peaks on the hydrographs represents increasing duration of flow at the lower rates.

The flows delineated by the thin width of the peaks on their upper part are high rates of discharge, the direct result of intense rainfall on saturated or snow-covered areas. Since high rates of rainfall do not continue over long periods of time, the duration of these excessively large rates of run-off is brief and the peaks on the hydrographs have a narrow width. As lesser flows are considered, the run-off from medium and low rates of rainfall, which continue much longer, as well as the tardy waters draining off the catchment area in the wake of heavy storms, are included to a greater extent and the peaks on the hydrographs have a greater width. The duration of the lower rates of rainfall is so much longer than the duration of the higher rates that much greater volumes of water would have to be detained by reservoirs if floods were to be reduced to as much as a quarter or less of the rate of a large flood than to only a half.

A further increase in the volume of water that would have to be detained in order to limit flood flows to much less than half that of a once-in-25-year flood comes from melting snow on those streams a considerable part of whose drainage areas extends into high altitudes. As illustrated by the hydrographs of the Mokelumne and San Joaquin on Plate I, fairly high rates of discharge occur from melting snow during May, June and July. The Sacramento and the San Gabriel, the two other illustrative streams, do not have snow-water floods. Unlike the flood discharge from rainfall, that from melting snow continues over rather long periods of time. However, their greatest rate seldom exceeds half that of a once-in-25-year flood, so that they concern flood control only if floods are to be reduced to less than this rate of flow.

While the foregoing considerations are very general and are principally illustrative of the characteristics of stream flow to be analyzed in detail in later chapters, nevertheless, they indicate that the volume of water to be detained by reservoirs would increase very rapidly if an attempt were made to reduce floods to much less than half a once-in-25-year flood. The capacity required to do this would be much larger than probably will be constructed on most of the State's streams for many years to come. The relatively small space required to reduce floods to half the rate of a once-in-25-year flood or thereabouts makes it appear, in general, that this would be the possible present utility of conservation reservoirs for controlling floods. A coordinated program of operation for both conservation and flood control would be necessary for this accomplishment.

CHAPTER II.

SYSTEMS OF FLOOD CONTROL.

Leveed channel system.

There are, in general, two systems of flood control: one that leads flood flows to the ocean in specially prepared channels without diminution in volume, the other that reduces the volume of flow to a harmless amount by detention of excess water in storage reservoirs. The first is the system in common use, for it is usually least in cost. The reasonable cost of this system is attained by constructing the greater part of the flood channels above the ground surface. The banks of the channels are formed by earthen levees excavated from adjacent borrow pits. The capacity of the channels is fixed by the spacing and height of the levees. Seldom does the borrow pit from which the levee material is excavated constitute a very large part of the waterway. Even where the leveed channels follow natural water courses, their increased capacity, due to the construction of the levees, is largely in the cross-sectional area above the ground surface. Thus, the safety of the system rests upon the strength of the levees to withstand the water pressure and the sufficiency of the carrying capacity of the flood channels. Should the levees fail or be breached by over-topping, a large part of the entire flood volume might run through the breach over the adjacent land.

One of the principal reasons for success in this system of protection is the infrequent occurrence and short duration of large floods that tax the strength of the levees and the capacity of the channels. On the other hand, one of the principal dangers in this system is the neglect of maintenance of the levees and channels through a false sense of security that develops during the ten-or-more-year average intervals between large floods. The levees that form the channel banks may settle, crack or be holed by burrowing animals during the long periods of only partial use. Also, the channel capacity may deteriorate through the growth of trees, brush or tule or the deposit of silt by the lesser floods. The intermittent wettings from smaller floods encourage channel growths. The usually fertile soil and the favorable moisture conditions on the low land that flood channels naturally occupy often produce obstructive growths that occupy considerable parts of the waterway areas. The maintenance of these channels in condition to safely carry off the infrequently occurring large floods requires constant attention and very considerable expense.

Reservoir system.

The second system of flood control, that which reduces the volume of flood flow by detention of excess water in storage reservoirs, is a recent innovation in California. The Los Angeles County Flood Control District now has a $40,000,000 program under way. This provides for the construction of thirteen reservoirs for flood control purposes on Los Angeles County streams. The City of Stockton has undertaken the construction of a reservoir on the Calaveras River solely for flood

control purposes. The reservoir system has been adopted in these instances because the high property values and close settlement of some of the territory protected permits greater expenditures than have been customary in the past.

The high cost of constructing reservoirs for flood control alone and the large size required to reduce floods to harmless amounts limits the usefulness of the reservoir system of protection. To be effective with certainty, liberal reservoir capacity has to be provided and the rules of operation rigidly adhered to so that this space will surely be empty at the time needed for detaining flood waters. The system is attractive, however, where the cost is justified, because of the shorter traffic crossings on the smaller channels needed, the elimination of the bother and expense of maintaining large waterways in expectancy of a great flood through years of use to but a small part of their total capacity, and the possibility of utilizing areas that would otherwise be occupied by flood channels.

Combined reservoir and leveed channel system.

It was pointed out in the first chapter that there is a physical opportunity to obtain joint use of the same space in reservoirs for both conservation and flood control purposes. It was pointed out also that the present possibility for economical joint use of the same reservoir space will, in general, be limited to a reduction of flood flows to a half or a third of that of a large flood. On many streams in California, leveed channels will be required to carry off even a half or a third the volume of a large flood, although, of course, the size of these channels need not be nearly as large. Therefore, leveed channels will probably remain part of most of our flood protection systems until either the close settlement of the overflow areas warrants the great expense of their complete elimination, or the demand for additional water supplies forces the construction of much greater reservoir capacity than will be required for a good many years at the present rate of growth. Thus, the combination of the reservoir and the leveed channel system of protection will probably be most suitable to conditions on many California streams for some time to come.

The suitability of the combined system to the immediate future is fortunate, because often much of the work first constructed under the leveed channel system may be utilized in the combined system to afford an increased degree of protection. Also, the combined system of protection removes the most unsatisfactory features of the leveed channel system. In California, the leveed channels take up much room and form awkward obstacles to traffic and communication. This public inconvenience rapidly gains importance as territory becomes more thickly populated. The cost of bridges alone over wide channels is a large item of expense and increases greatly as denser population demands more convenient routes of communication.

In southern California, whose rapid growth has already brought 20 per cent of available flat lands into incorporated cities and towns, and where their extent is limited, the occupation of large areas by flood channels is a serious impediment to community expansion. Although the extent of flat lands is greater in northern California, the area occupied by flood channels is nevertheless a considerable item in the

inventory of lands favorable for intensive human occupation. One of the channels of the flood control project in the Sacramento Valley is as much as three miles in width, and in total all the channels of this project occupy 250 square miles of territory that can be put to only partial use.

The channels of the combined system would be of moderate size and capacity. Such channels could be more easily maintained, both because they would be smaller in size and because a larger part of their total capacity would be used oftener. The elimination by reservoir control of the excessively high rates of run-off that are particularly dangerous by surcharging the present large channels at very infrequent intervals would add to the safety of occupying adjacent lands. The smaller channels would leave greater areas to be reclaimed and would not constitute unduly awkward barriers to traffic and communication under the conditions of the near future. Thus, the combined reservoir and leveed channel system of protection has distinct advantages. If a satisfactory program could be devised for the joint use of the same reservoir space for both conservation and flood control, it will come into use on many California streams. On those streams where leveed channels are already constructed, the safety of protection would be increased, and on other streams the cost of building the leveed channels would be reduced. All localities would be benefited.

The Sacramento Valley has progressed further than any other section of California in perfecting a leveed channel system of flood protection. Here a very extensive program is about two-thirds complete. The levees along the main river channel are constructed to grade and cross-section for practically the entire length and a substantial part of the large by-passes is already built. The principal unfinished work lies along the tributary streams. The control of floods by reservoirs could not affect the works already constructed except to increase their efficiency in protecting the reclaimed lands. It would reduce somewhat the volume of unfinished work, but the greatest benefit would accrue by the attainment of a higher degree of protection than is afforded by the present system of leveed channels alone whose planned degree of safety is inadequate for the intensive development and close settlement of the future. Other benefits would accrue in the reduced project maintenance and in the greater reclaimed areas and shorter traffic crossings attending the use of narrower channels than are at present planned along the tributary streams. Thus, the combined reservoir and leveed channel system of flood protection would have great value even in the Sacramento Valley, where the leveed channel system is largely completed.

Degree of protection in flood control systems.

In estimating the future, while witnessing the present rapid growth of population and expansion in property values, it would seem that public policy may require a higher degree of protection than present economy would dictate in order to preserve public confidence in the safety of residing and doing business in areas subject to flood hazard. From this viewpoint, the degree of protection rendered by flood control works becomes an important subject, for about a fifth of all the agricultural area in its natural condition is subject to flood menace.

In examining the essential characteristics of the two systems of flood protection, there does not seem to be any inherent difference in the degree of protection afforded by either one. Although there is a danger in transporting large volumes of water above the ground surface between parallel leveees because of the dependence for safety upon the integrity of many miles of earth dike, nevertheless this system could be constructed to offer the same degree of protection that is contained in the reservoir system. The levees would have to be built with heavy cross-section and protected on their face from wave wash and sloughing and the channels would have to be properly maintained.

The degree of protection offered by either system or their combination, if sound physical works are constructed with equal safety factors, is essentially dependent upon the possibility of occurrence of floods greater than the capacity for which the system is designed. Under either system, should a flood exceed the design capacity, the channels would be surcharged, with the consequent flooding of the adjacent lands. Inquiry into the possibility of occurrence of floods greater than the design capacity of protective systems, therefore, must be the principal feature of a general discussion of the degree of protection offered by flood control systems.

Frequency of flood occurrence.

A discussion of the occurrence of floods in California streams and the probable frequency with which floods of various sizes might be expected to occur has been presented in the 1923 report* on the water resources of the State. Here it is shown that stream flow closely follows the characteristics of precipitation, the volume of which is the resultant of the vicissitudes of weather so complex that they defy analysis.

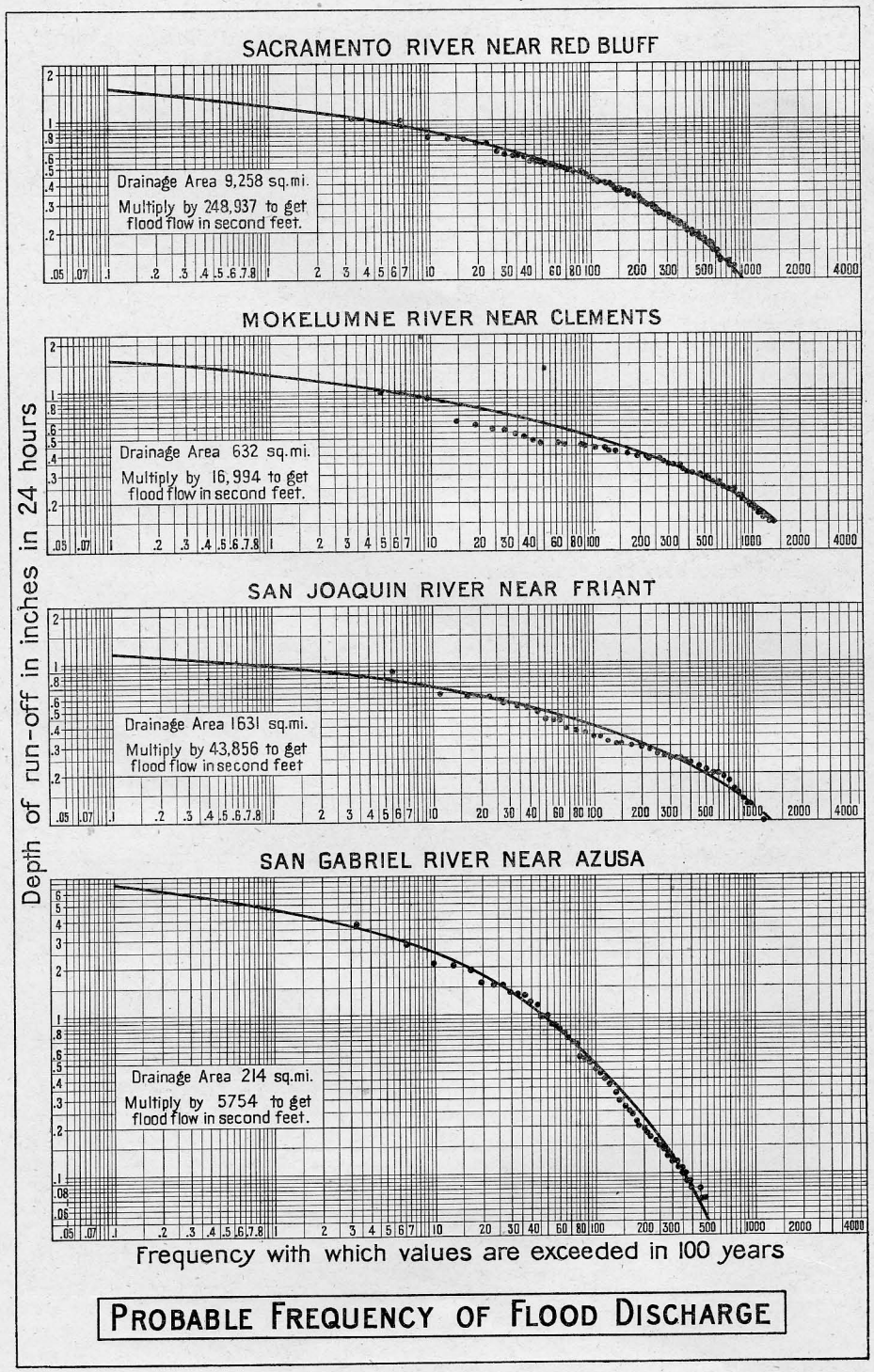
Precipitation records show that extremely high rates of rainfall are rather infrequent and invariably occur in the winter months only. The record at San Francisco,** centrally located and one of the longest in the State, shows that more than four inches of rain in twenty-four hours occurred but once in the sixty-one years of record, while from three to four inches of rain in twenty-four hours occurred nine times in sixty-one years, from two to three inches twenty-nine times, and from one to two inches one hundred and sixty times. Thus, it is seen that the highest rates of rainfall occur only at long average intervals of time, while the lower rates occur oftener and with increasing frequency as the rate becomes less.

The duration of rainstorms follows a similar behavior. The San Francisco record shows that eight consecutive days of rain averaging more than one inch in twenty-four hours occurred but four times in the sixty-one years of record, while it occurred for four consecutive days twenty-nine times, for three consecutive days fifty-three times, two consecutive days one hundred and nine times, and one day three hundred and eight times. Since it is the combination of extended storms and high rates of precipitation that furnish flood run-off, the frequency of flood occurrence in the stream channels of California may be expected

* Chap. V, Bul. No. 5, "Flow in California Streams," of the Division of Engineering and Irrigation. State Department of Public Works.

** U. S. Weather Bureau Record 1897 to 1926. Private Record of John Petee 1865 to 1897.

PLATE II.


SACRAMENTO RIVER NEAR RED BLUFF
Drainage Area 9,258 sq.mi.
Multiply by 248,937 to get flood flow in second feet.
MOKELUMNE RIVER NEAR CLEMENTS
Drainage Area 632 sq.mi.
Multiply by 16,994 to get flood flow in second feet.
SAN JOAQUIN RIVER NEAR FRIANT
Drainage Area 1631 sq.mi.
Multiply by 43,856 to get flood flow in second feet
SAN GABRIEL RIVER NEAR AZUSA
Drainage Area 214 sq.mi.
Multiply by 5754 to get flood flow in second feet.
Depth of run-off in inches in 24 hours
Frequency with which values are exceeded in 100 years
PROBABLE FREQUENCY OF FLOOD DISCHARGE

to have characteristics similar to the frequency and duration of the higher rates of precipitation.

An extended comparison of all the stream-gaging records in the State* reveals this to be true. Although this study does not disclose the sequence with which floods of various sizes follow one another, it does indicate that there is a rather fixed relation between the size of floods and the average interval of time between their occurrence. In general, it indicates that, on an average of once in four years, floods may occur double or more the size that is exceeded but once a year; that on an average of once in twenty years floods may occur three or more times this volume; that once in two hundred years they may occur over four times this volume; and at intervals of a few thousand years a flood may be expected surpassing five times the volume that is exceeded on an average but once a year. It thus appears that the largest possible flood may not have occurred on any California stream since white man has resided here, and that the greatest flood yet observed on any of the streams may be exceeded at any time, but only at average intervals that increase in length as the magnitude of the excess is greater.

The relation of the size of floods to the average interval of time between their occurrence disclosed by the stream flow records on four typical streams, the Sacramento, the Mokelumne, the San Joaquin and the San Gabriel rivers, is set forth on Plate II, "Probable Frequency of Flood Discharge." For convenience of comparison, the rate of flood run-off is here expressed as inches depth of run-off in twenty-four hours on the tributary drainage area. A multiplying factor is given on each chart to convert the values of depth of run-off on the drainage area into mean rate of run-off for twenty-four hours in second-feet. The horizontal scale expresses the frequency with which values are exceeded in 100 years. The dots plotted on the charts are the floods on the respective streams taken from the records of measured stream flow that have been maintained for the past twenty to thirty years. The actual occurrences counted from the records have been expanded by proportion to obtain the probable number that would have occurred had the record been 100 years in length. Double logarithmic scales were used in plotting these charts because of the convenience in shape of the resulting curves.

To illustrate the interpretation of Plate II, reference is made to the upper diagram portraying the probable frequency of flood occurrence on the Sacramento River near Red Bluff. On this diagram the horizontal scale represents frequency. The whole figure 1 represents one flood crest in 100 years. One-tenth represents one-tenth of a flood in 100 years or one flood in 1000 years. Similarly 4 represents four flood crests in 100 years or one each 25 years. Following up the vertical line labeled 4 on the horizontal frequency scale, to intersection with the curve, it will be noted that the value opposite the intersection on the vertical scale of run-off on the left is one. This means that, on an average, four flood crests in 100 years, or one in twenty-five years, will probably exceed one inch in depth of run-off in twenty-four hours on the tributary drainage area. This rate of flood run-off is converted into second-feet by multiplying by the factor 248,937 (shown on the face of the diagram). Thus 249,000 second-feet mean daily flow may be

* Chap. V, Bul. No. 5, "Flow in California Streams," of the Division of Engineering and Irrigation, State Department of Public Works.

exceeded on an average of once in 25 years. For convenience, this value has been referred to in Chapter I as the "once-in-25-year flood." It approximates the flood called "maximum" in the usual engineering parlance of this locality.

It may be observed on Plate II that the plotted data fairly define curves of regular shape that may be extended beyond the limits of the observations. By so doing, some comprehension may be gained of the frequency with which floods might occur greater than those appearing in the comparatively short period of observation. The following table, obtained by scaling the charts, shows how rarely the excessively large floods occur. It also shows how the size of flood, that may be expected at increasing intervals, grows larger quite rapidly up to those occurring on an average of once in twenty-five years. For longer intervals the size grows larger less rapidly.

DEPTH OF FLOOD RUN-OFF ON DRAINAGE AREA OF FOUR ILLUSTRATIVE STREAMS IN INCHES PER 24 HOURS.

River	Frequency with which values are exceeded					
	Once a year	Once in 10 years	Once in 25 years	Once in 50 years	Once in 100 years	Once in 1000 years
Sacramento	0.44	0.85	1.00	1.15	1.25	1.65
Mokelumne*	0.51	0.89	1.05	1.15	1.25	1.61
San Joaquin	0.40	0.71	0.81	0.89	0.96	1.22
San Gabriel	0.49	2.49	3.34	4.00	4.62	6.74

It is seen that the depth of flood run-off from the drainage areas of the three streams north of Tehachapi Pass is much alike for large floods, except that it is slightly smaller on the San Joaquin River. The depth of flood run-off on the San Gabriel, a typical stream of southern California, is several times as great for large floods as on the northern streams. It shows how much larger floods in proportion to the size of their drainage areas develop on the southern streams.

The foregoing table of frequency of flood flows on the four illustrative streams, in expressing the rate of run-off in inches depth on the drainage area per twenty-four hours, does not show the actual magnitude of the flood values. The following table expresses the values parallel to the former table in second-feet. These are the estimated quantities at the gaging station on each stream near the edge of the valley floor.

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

FLOOD RUN-OFF OF THE FOUR ILLUSTRATIVE STREAMS IN SECOND-FEET.

River	Frequency with which values are exceeded					
	Once a year	Once in 10 years	Once in 25 years	Once in 50 years	Once in 100 years	Once in 1000 years
Sacramento	109,000	212,000	249,000	286,000	311,000	411,000
Mokelumne*	8,700	15,100	17,800	19,500	21,200	27,400
San Joaquin	17,500	31,200	35,600	39,000	42,100	53,500
San Gabriel	2,800	14,300	19,200	23,000	26,600	38,800

It is interesting to note in examining the charts of Plate II that, even with the continued extension of these curves to intervals of time thousands of years long, the size of floods still grows larger with the increasing length of the interval. This indicates that there probably is no limit to the size of floods that may occur, but that the very largest ones occur only at intervals of many thousands of years. It would appear, therefore, that absolute protection from floods is impossible and that the degree of protection desired should be carefully considered in laying out protective systems.

Because of the unlimited size in which floods may occur, flood control embodies an economic question as to the size for which protective works should be designed. The engineering profession has generally accepted designs based upon the greatest flood of record or upon a more or less arbitrary increase to it resulting from a study of high water marks or the memory of old inhabitants. The foregoing analysis, however, shows that all of these may be exceeded at long intervals of time. The design floods used in the adopted flood control plan ** for the Sacramento Valley, the greatest work in flood control consummated in California, are found to closely approximate the mean daily values that may be exceeded on an average of once in twenty-five years. The design quantities adopted by the California Debris Commission in 1911 were revised in 1925 after further study. Both the original and revised quantities are compared to the once-in-25-year values in the following table:

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

** Report of California Debris Commission, June 29, 1911.

COMPARISON OF DESIGN FLOOD FLOW USED BY CALIFORNIA DEBRIS COMMISSION IN SACRAMENTO VALLEY FLOOD CONTROL PROJECT WITH THE ONCE-IN-25-YEAR VALUES OF THE WATER RESOURCES INVESTIGATION.

Stream	Design flood flows of California Debris Commission in second-feet		Flood flows (av. 24 hrs.) exceeded once in 25 years Water Resources Investigation in second-feet
	1911 Report	1925 Report	
Sacramento River near Red Bluff	250,000	260,000	249,000
Feather River	150,000	180,000	171,000
Yuba River	110,000	120,000	128,000
Bear River	30,000	30,000	29,000
American River	120,000	128,000	119,000
Stony Creek	30,000	30,000	45,000
Cache Creek	20,000	20,000	20,000
Putah Creek	25,000	25,000	46,000

In the Sacramento Valley the crest discharge of large floods is approximately 10 per cent greater than the average flow for twenty-four hours. Therefore, the crest of the once-in-25-year flood would encroach upon the freeboard of the levees of the Debris Commission plan to the extent of about 10 per cent of the channel capacity. Since this encroachment on the freeboard would be of only a few hours' duration, with usual maintenance, the works as planned should protect the project against floods that will not be exceeded on an average oftener than once in twenty-five years. Because of the difficulty in parts of the project, not intensively cultivated, of meeting assessments for the work from the sale of products of the land, it is believed that this protection is greater than these lands can now afford. On the other hand, perhaps it is not a sufficient degree of protection for the intensively cultivated sections and the thickly populated areas about the City of Sacramento. It would seem that at least the design flood for the American River, which directly menaces the City of Sacramento, should be relatively larger than for other parts of the project. Thus, the degree of protection employed in designing flood control projects should be governed by the class of territory to be protected. Logically, it should be increased from time to time as the territory becomes more thickly populated and property values become larger. The analysis here presented offers a convenient means of expressing the degree of protection of any project in terms of the average interval of time in which the design flood may be expected to be exceeded.

CHAPTER III.

THE PRINCIPAL CHARACTERISTICS OF FLOOD OCCURRENCE.

Regularity of flood occurrence.

It has been pointed out in Chapter II, that the records of stream flow in California disclose a relation between the size of floods and the average frequency of their occurrence. Floods occur in their varying sizes at regular average intervals throughout long periods of time. Although floods happen almost every year, only the smaller ones are at all frequent. Extremely large floods occur at such long average intervals that several generations may pass without witnessing one of greatest magnitude. This relation disregards the sequence with which the various sizes follow one another and expresses only the average frequency of their occurrence. A glance at the records is conclusive that the actual sequence is most irregular although the average occurrence seems to follow a regular behavior.

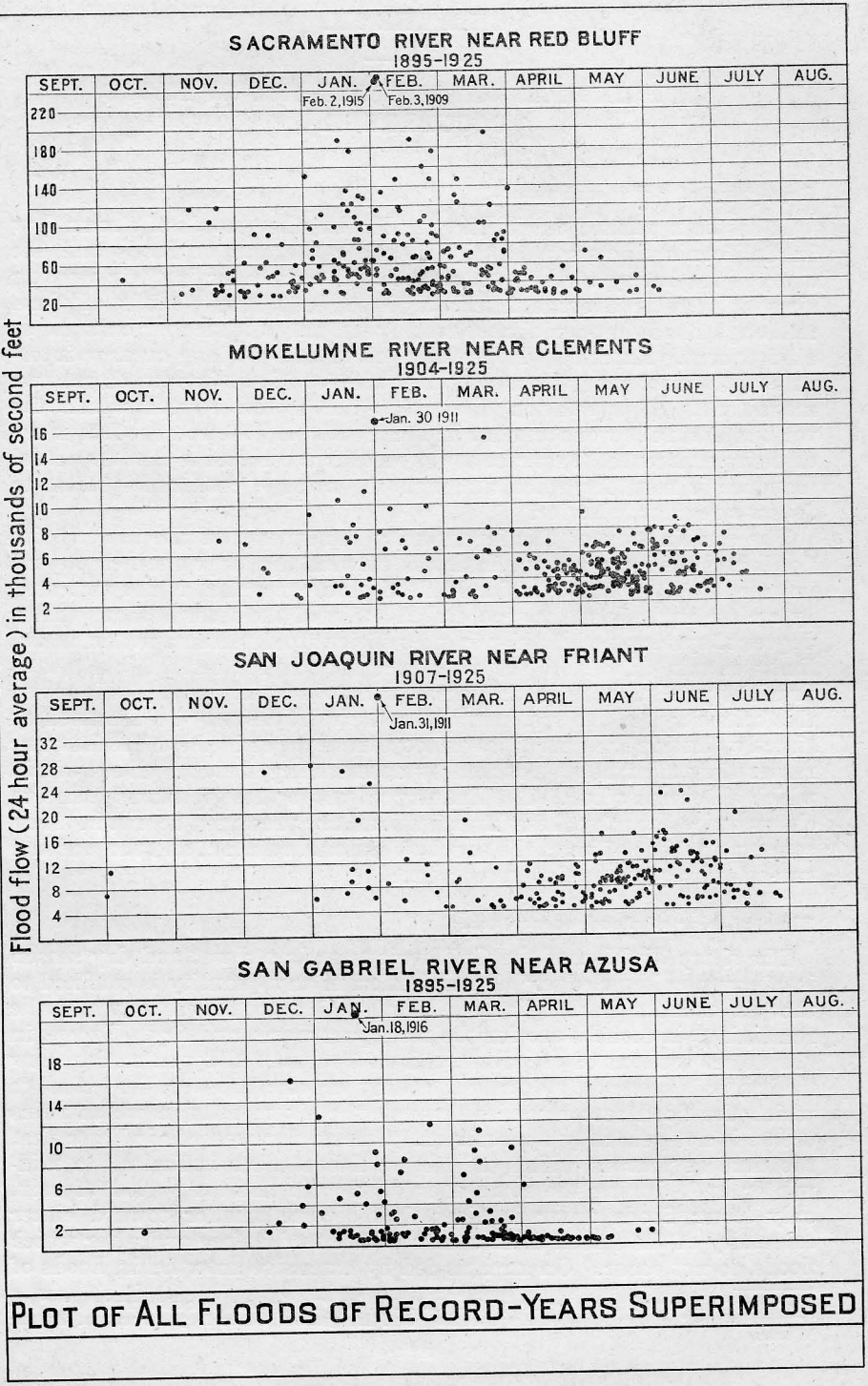
The combination of this irregularity in sequence of the various size floods and the long average intervals between the large ones, creates an impression of erratic behavior in flood occurrence that is not indicated by a close analysis of the records. A study of the records shows that a degree of systematic behavior exists sufficient to determine within useful limits certain characteristics as to the time of year and the amount of previous precipitation in the season with which they occur. However, this behavior is not so systematic that the relations may be discussed by directly plotting the quantities on coordinate paper in the usual manner; rather they must be approached by determining limiting values within which all events occur. The limiting values to these relations found to characterize floods by these investigations, are presented herewith. They concern the time of year, the previous seasonal rainfall, and the seasonal run-off subsequent to flood occurrence.

Time of year of flood occurrence.

The sharp division of the California year into a wet and dry season is of common knowledge.* Precipitation in any quantity is confined to the six months period from November 1st to May 1st while the remaining six months are for the most part warm and dry. Except in the desert sections of the State and on streams fed by extensive snow fields, floods occur only during the rainy season; however, the extent to which the flood season varies through the six months in which rains occur, is not generally appreciated. Stream flow records indicate that the time of year in which the largest floods occur is limited to mid-winter and, during the remainder of the six months period of rain, only lesser floods occur in sizes that become smaller toward either extremity of the season until a date is disclosed before and after which floods do not occur. On streams fed by extensive snow fields, floods of

* For full exposition see Chap. II, Bul. No. 6, "Irrigation Requirements of California Lands," of Division of Engineering and Irrigation. State Department of Public Works.

PLATE III.


SACRAMENTO RIVER NEAR RED BLUFF
1895-1925
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
Feb. 2, 1915
Feb. 3, 1909
220
180
140
100
60
20
MOKELUMNE RIVER NEAR CLEMENTS
1904-1925
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
Jan. 30 1911
16
14
12
10
8
6
4
2
SAN JOAQUIN RIVER NEAR FRIANT
1907-1925
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
Jan. 31, 1911
32
28
24
20
16
12
8
4
SAN GABRIEL RIVER NEAR AZUSA
1895-1925
SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG.
Jan. 18, 1916
18
14
10
6
2
Flood flow (24 hour average) in thousands of second feet
PLOT OF ALL FLOODS OF RECORD-YEARS SUPERIMPOSED

medium size occur in the early summer after the close of the precipitation season. These floods, fed by melting snow, are not as large but are of longer duration than those fed from rainfall. They have their special characteristics. An extended investigation of the time of year of flood occurrence was made on streams having the longest record of measurements. In order to avoid a tiresome review of similar data, those of four typical streams only are presented, the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers. These data are displayed on Plate III, "Plot of All Floods of Record—Years Superimposed." A dot is plotted on this plate for every flood of record both large and small, at the day of its occurrence indicated on the horizontal time scale. The size of each flood in second-feet is shown on the vertical scale.

The great preponderance of small floods and the apparent irregularity in occurrence of the larger ones may be observed at once by the relative position of the dots. The manner of their clustering also illustrates how the larger floods occur during the midwinter months and how their magnitude decreases towards the fore and latter part of the season.

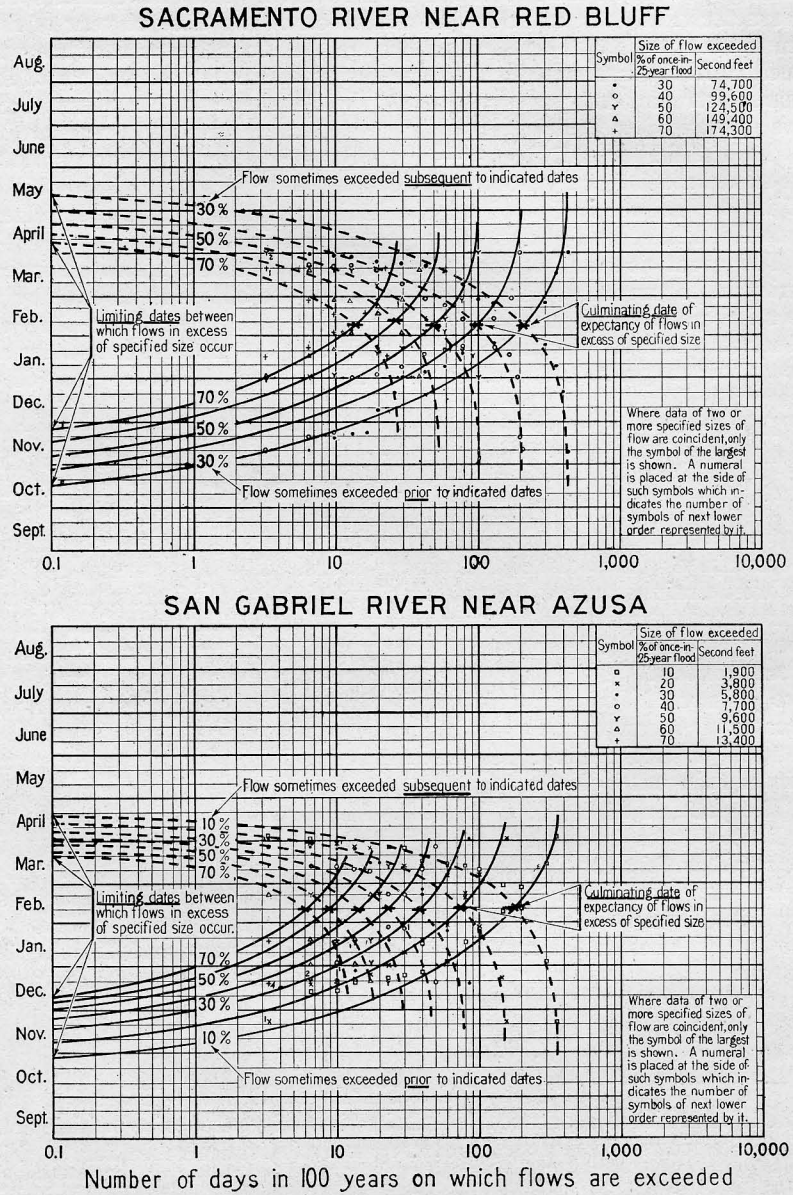
The dots of greatest height on the graphs are in the midwinter months for all four streams. These represent rain-water floods. The dots on the plots for the Mokelumne and San Joaquin rivers forming a distinct cluster in the early summer months, but of lesser height, represent floods resulting from rapidly melting snow on the high mountainous parts of their drainage areas. The Sacramento and San Gabriel drainage areas do not have sufficient precipitation as snow to cause floods during the melting season. Most of the snow that falls on these drainage areas melts in the early spring and augments the run-off from rainfall. It is interesting to note from the manner in which the two groups of dots cluster, that floods from melting snow occur with greater frequency and regularity than those from rainfall but, in general, do not attain much more than half the size of the large midwinter rain-water floods.

The position of the dots, in relation to the time scale of the diagram, indicates dates before and after which floods of much size have not occurred within the 20 to 30 years of record on these streams. These dates vary somewhat on the several streams but, in general, floods resulting from rainfall occur between November 1st and May 1st with the largest ones in the months of January, February and March. The snow-water floods occur between May 1st and August 1st with the greatest ones in the first half of June.

Limiting dates to the flood season.

While Plate III, "Plot of All Floods of Record—Years Superimposed," furnishes a perspective of the time of year during which floods of the various sizes occur, a closer analysis is desirable for working purposes. It may be observed on Plate III that the relation between the size of floods and the time of their occurrence is rather broad in its character. There appears, however, to be certain limiting dates for the medium and large floods before and after which the many records of daily run-off disclose neither an instance of nor a tendency toward floods of that size occurring. For a close valuation of these limiting dates, it is not enough to enter the records of occurrence and select the dates

PLATE IV.



RELATION OF TIME OF YEAR TO FLOOD OCCURRENCE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH FLOWS OCCUR IN EXCESS OF SPECIFIED SIZE PRIOR AND SUBSEQUENT TO INDICATED DATES

Flows expressed in per cent of greatest daily rate of flow of once-in-25-year flood

before and after which large floods have not occurred. In so doing, no conception would be gained of the reliance that could be placed upon their future occurrence within the dates selected.

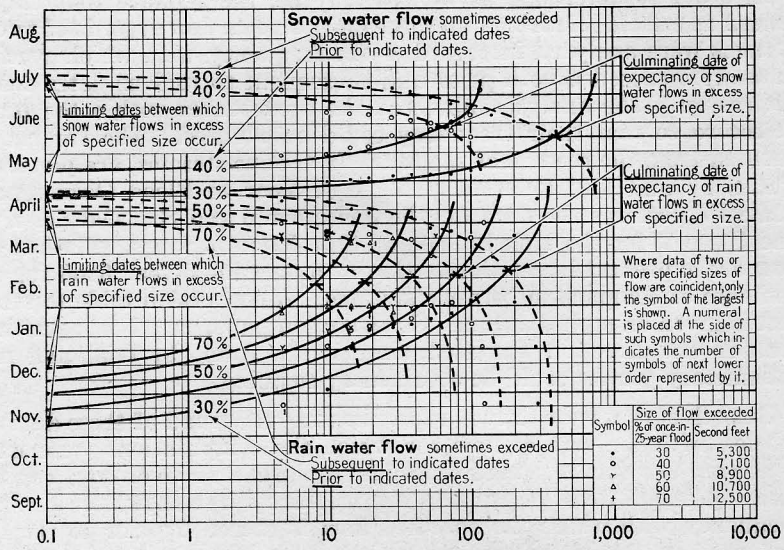
In order to determine as well as may be, the reliance that may be placed on selected limiting dates, the daily stream flow records of twenty streams were analyzed in regard to the frequency with which specified flows were exceeded both prior and subsequent to various dates during the season. The analysis tabulated the occurrences within the period of record so that their frequency could be counted. The frequencies counted from the records of the four illustrative streams, are plotted on Plates IV and V, "Relation of Time of Year to Flood Occurrence." Plate IV presents the data for the Sacramento and San Gabriel rivers and Plate V for the Mokelumne and San Joaquin rivers. The rates of flow are expressed in relation to that of a once-in-25-year flood for convenience of comparison between streams. A conversion table to second feet is given on each diagram. Cross-section paper ruled to logarithmic scale in one direction was used, since it was found by trial that more satisfactory graphs could be obtained by so doing.

Smooth curves were drawn approximating the trend of these data and labeled with the rate of flow for which the computations were made. There are two curves in each diagram for the same rate of flow, one full-line and one dotted-line curve. The full-line curve shows the probable frequency with which the specified flow is exceeded prior to the date indicated on the vertical scale. The dotted-line curve shows the probable frequency with which it is exceeded subsequent to the date indicated on the vertical scale. While it is evident that the data do not disclose exact relationships, it may be noted that the curves representing the smaller flows are fairly well defined. More data are available concerning small flows than large ones for they appear a greater number of times in the records. The short term of the records relative to the infrequent occurrence of large flood flows prevents their containing adequate data for displaying the relations plainly. Were there as many data contained in the comparatively short records concerning the larger flows as there are for the smaller ones, it seems probable that their curves would be equally well defined. However, the curves for the larger values take logical positions in relation to available data when drafted by comparison with the data for the smaller flows.

The advantage of the analysis delineated on Plates IV and V is that the curves of relationship developed from the data collected during a quarter century, may be extended to indicate expectancies, had the records covered much longer periods of time. For instance, by extending these curves to intersect the 0.1 line on the frequency scale, the time of the year before and after which greater flows than the specified sizes do not occur oftener than one day in a thousand years (0.1 day in 100 years) is indicated on the vertical time scale by the points of intersection. Intercepts of the full and dotted-line curves on other verticals than the 0.1 line, indicate on the vertical time scale, the period of the year before and after which the specified flows are exceeded more frequently than one day in a thousand years. The frequency with which they are exceeded is shown by the position of the vertical line intersected by the two curves on the horizontal frequency scale.

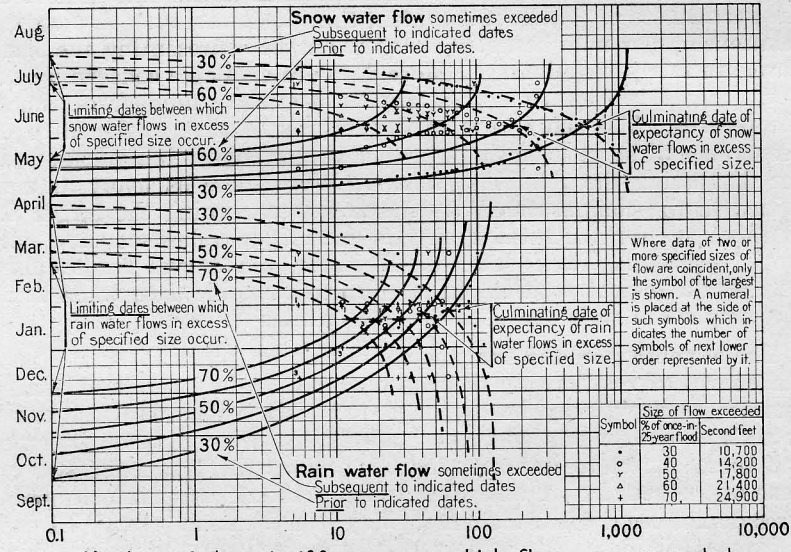
PLATE V.

MOKELUMNE RIVER NEAR CLEMENTS



Symbol	Size of Flow exceeded: % of once-in-25-year flood	Second feet
•	30	5,300
o	40	7,100
Y	50	8,900
Δ	60	10,700
+	70	12,500

SAN JOAQUIN RIVER NEAR FRIANT



Symbol	Size of Flow exceeded: % of once-in-25-year flood	Second feet
•	30	10,700
o	40	14,200
Y	50	17,800
Δ	60	21,400
+	70	24,900

Number of days in 100 years on which flows are exceeded

RELATION OF TIME OF YEAR TO FLOOD OCCURRENCE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH FLOWS OCCUR IN EXCESS OF SPECIFIED SIZE PRIOR AND SUBSEQUENT TO INDICATED DATES.

Flows expressed in per cent of greatest daily rate of flow of a once-in-25-year flood.

By way of illustration of the interpretation of these plates, reference is made to the upper chart on Plate IV, showing the relation of the time of year to flood occurrence on the Sacramento River near Red Bluff. Selecting the vertical ordinate that passes through the figure 1 on the horizontal frequency scale, it is seen to intersect the full-line curve labeled 50 per cent, opposite November 22d on the vertical time scale to the left. This means that on an average of one day in 100 years there probably will be a flow exceeding 50 per cent of a once-in-25-year flood prior to November 22d. Following the same vertical ordinate to intersection with the dotted-line curve labeled 50 per cent, it is seen that the intersection is opposite April 12th on the time scale to the left. This means that on an average of one day in 100 years, a flow exceeding 50 per cent of a once-in-25-year flood will probably occur subsequent to April 12th. Thus, November 22d and April 12th are the limiting dates of the season for floods greater than half the size of the once-in-25-year value with the probability that either limit may not be exceeded oftener on an average than one day in 100 years.

The information taken from Plates IV and V is expressed in the following tables. Here are given in the several columns the probable dates before and after which greater flows than the several specified sizes do not occur oftener on the average than one day in a thousand, one day in a hundred, one day in fifty, one day in twenty-five and one day in ten years. It is interesting to observe in reviewing these tables, that, of the 365 days in the year, the season for the occurrence of rain-water floods of corresponding size (equal per cent of once-in-25-year flood) opens and closes on the four illustrative streams with the greatest variance in dates of 47 days. It opens from 40 to 72 days earlier for the smaller floods than for the large ones and closes from 20 to 57 days later. For decreasing the probability from one day in 10 years to one day in 1000 years that flows in excess of those specified will not occur either before or after these opening and closing dates, the season opens as much as 65 days earlier and closes as much as 49 days later.

The season for the occurrence of floods from rapidly melting snow is seen to be less variable than that for rain-water floods. Of the two illustrative streams having snow-water floods, the season for floods of corresponding size opens and closes within 14 days of the same dates and these dates do not change more than 23 days for decreasing the probability from one day in 10 years to one day in 1000 years that flows in excess of those specified will not occur either before or after the opening or closing dates.

LIMITING DATES OF FLOOD SEASON ON SACRAMENTO RIVER.

Size of flood near Red Bluff—greatest daily rate of flow		Opening dates					Closing dates				
		Frequency with which greater flows occur **prior** to tabulated date					Frequency with which greater flows occur **subsequent** to tabulated date				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
30	74,700	Oct. 15	Oct. 29	Nov. 4	Nov. 11	Nov. 23	May 12	May 4	Apr. 30	Apr. 25	Apr. 15
40	99,600	Oct. 27	Nov. 11	Nov. 17	Nov. 25	Dec. 9	Apr. 30	Apr. 21	Apr. 17	Apr. 10	Mar. 31
50	124,500	Nov. 7	Nov. 22	Nov. 29	Dec. 8	Dec. 24	Apr. 21	Apr. 12	Apr. 7	Mar. 31	Mar. 19
60	149,400	Nov. 16	Dec. 2	Dec. 11	Dec. 21	Jan. 10	Apr. 13	Apr. 3	Mar. 29	Mar. 21	Mar. 7
70	174,300	Nov. 24	Dec. 11	Dec. 22	Jan. 4	Jan. 28	Apr. 7	Mar. 27	Mar. 19	Mar. 9	Feb. 17

LIMITING DATES OF FLOOD SEASON ON MOKELUMNE RIVER.

Size of flood near Clements—greatest daily rate of flow		Opening dates					Closing dates				
		Frequency with which greater flows occur **prior** to tabulated date					Frequency with which greater flows occur **subsequent** to tabulated date				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
				Rain-Water Floods.							
30	5,300	Nov. 7	Nov. 18	Nov. 24	Dec. 1	Dec. 12	Apr. 24	Apr. 22	Apr. 20	Apr. 18	Apr. 14
40	7,100	Nov. 20	Dec. 1	Dec. 7	Dec. 14	Dec. 28	Apr. 19	Apr. 16	Apr. 14	Apr. 11	Apr. 5
50	8,900	Dec. 1	Dec. 12	Dec. 18	Dec. 27	Jan. 11	Apr. 14	Apr. 10	Apr. 8	Apr. 4	Mar. 25
60	10,700	Dec. 10	Dec. 22	Dec. 30	Jan. 9	Jan. 30	Apr. 9	Apr. 3	Mar. 30	Mar. 23	Mar. 8
70	12,500	Dec. 18	Dec. 31	Jan. 10	Jan. 25	.....	Apr. 4	Mar. 26	Mar. 19	Mar. 8	.....
				Snow-Water Floods.							
30	5,300	Apr. 22	Apr. 24	Apr. 25	Apr. 26	Apr. 27	July 15	July 13	July 12	July 10	July 7
40	7,100	May 8	May 10	May 12	May 14	May 19	July 9	July 5	July 3	June 30	June 25

LIMITING DATES OF FLOOD SEASON ON SAN JOAQUIN RIVER.

Size of flood near Friant—greatest daily rate of flow		Opening dates					Closing dates				
		Frequency with which greater flows occur **prior** to tabulated date					Frequency with which greater flows occur **subsequent** to tabulated date				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	10,700	Oct. 1	Oct. 20	Oct. 29	Nov. 9	Nov. 28	Apr. 14	Apr. 8	Apr. 4	Mar. 30	Mar. 19
40	14,200	Oct. 18	Nov. 3	Nov. 11	Nov. 21	Dec. 8	Mar. 30	Mar. 23	Mar. 19	Mar. 14	Mar. 2
50	17,800	Nov. 3	Nov. 16	Nov. 23	Dec. 2	Dec. 19	Mar. 19	Mar. 12	Mar. 7	Mar. 2	Feb. 17
60	21,400	Nov. 17	Nov. 29	Dec. 5	Dec. 13	Dec. 31	Mar. 11	Mar. 4	Feb. 27	Feb. 21	Feb. 7
70	24,900	Nov. 30	Dec. 11	Dec. 17	Dec. 25	Jan. 13	Mar. 4	Feb. 24	Feb. 20	Feb. 12	Jan. 27
					Snow-Water Floods.						
30	10,700	Apr. 20	Apr. 22	Apr. 23	Apr. 24	Apr. 27	July 29	July 25	July 23	July 21	July 18
40	14,200	Apr. 30	May 2	May 3	May 5	May 8	July 20	July 16	July 14	July 12	July 8
50	17,800	May 8	May 10	May 12	May 15	May 20	July 13	July 9	July 7	July 4	June 30
60	21,400	May 15	May 19	May 22	May 25	June 1	July 8	July 2	June 29	June 24	June 15

LIMITING DATES OF FLOOD SEASON ON SAN GABRIEL RIVER.

Size of flood near Azusa—greatest daily rate of flow		Opening dates					Closing dates				
		Frequency with which greater flows occur **prior** to tabulated date					Frequency with which greater flows occur **subsequent** to tabulated date				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
10	1,900	Oct. 28	Nov. 6	Nov. 11	Nov. 18	Nov. 29	Apr. 18	Apr. 14	Apr. 11	Apr. 8	Apr. 3
20	3,800	Nov. 8	Nov. 19	Nov. 25	Dec. 3	Dec. 17	Apr. 12	Apr. 7	Apr. 4	Apr. 1	Mar. 25
30	5,800	Nov. 17	Nov. 30	Dec. 7	Dec. 15	Dec. 31	Apr. 6	Apr. 2	Mar. 30	Mar. 26	Mar. 17
40	7,700	Nov. 25	Dec. 8	Dec. 16	Dec. 26	Jan. 14	Apr. 1	Mar. 28	Mar. 25	Mar. 19	Mar. 6
50	9,600	Dec. 1	Dec. 17	Dec. 25	Jan. 6	Jan. 28	Mar. 28	Mar. 23	Mar. 19	Mar. 12	Feb. 22
60	11,500	Dec. 6	Dec. 23	Jan. 2	Jan. 16	.....	Mar. 23	Mar. 17	Mar. 12	Mar. 3	.....
70	13,400	Dec. 10	Dec. 30	Jan. 11	Jan. 28	.....	Mar. 19	Mar. 12	Mar. 5	Feb. 22	.....

Date of greatest flood expectancy.

Since the analysis of flood occurrence as disclosed by the records of the last quarter century shows definite limiting dates to the flood season before and after which the probability of their occurrence is exceedingly remote, it is reasonable that the flood expectancy should increase toward some culminating date and then decrease as the end of the season is approached. The data plotted on Plate III, "Plot of All Floods of Record—Years Superimposed," indicate such culminating dates for the several streams.

On Plates IV and V, "Relation of the Time of Year to Flood Occurrence," pairs of curves are drafted, one dotted and one full-line, each pair representing a flow of a specified size. The dotted curves show the probable frequency with which flows greater than specified occur subsequent to the dates indicated on the vertical time scale. The full-line curves show in a similar way, the probable frequency of greater flows prior to the date indicated on the time scale. As the two curves of a pair, one dotted and one full-line, approach each other, flows greater than the specified size occur more frequently until the central day of the flood season is reached at their intersection. On this day, flows greater than the specified size occur both before and after with equal frequency. It is the central day of occurrence for flows greater than the specified size.

The dates of the intersection of the several pairs of curves on each stream are nearly the same. On the San Gabriel they are within one day of being the same, on the Sacramento three days, on the San Joaquin seven days, and on the Mokelumne nine days. These dates are so nearly alike for the several size flows on each stream that they may be taken as the culminating dates of flood expectancy. They vary on the four illustrative streams from January 20 to February 26 for rain-water floods and, on the two illustrative streams having snow-water floods, from May 31 to June 8. These dates are listed in the following table:

CULMINATING DATES OF FLOOD EXPECTANCY.

Size of flood	Date					
In per cent of greatest daily rate of flow of once-in-25-year flood	Sacramento River	Mokelumne River		San Joaquin River		San Gabriel River
		Rain-water floods	Snow-water floods	Rain-water floods	Snow-water floods	
10	.....	.....	.....	.....	.....	Feb. 11
20	.....	.....	.....	.....	.....	Feb. 11
30	Feb. 8	Feb. 26	May 31	Jan. 27	June 6	Feb. 10
40	Feb. 7	Feb. 23	June 7	Jan. 24	June 7	Feb. 10
50	Feb. 8	Feb. 21	.....	Jan. 21	June 8	Feb. 10
60	Feb. 10	Feb. 18	.....	Jan. 20	June 8	Feb. 10
70	Feb. 7	Feb. 17	.....	Jan. 20	.....	Feb. 10

Preparatory precipitation for flood occurrence.

While the records of stream flow show that there is a definite season within which floods occur and that the expectancy of floods within this season increases toward culmination at some mid-season date, nevertheless. the expectancy on the successive days of each season is not

identical in every year. Floods can not occur without preparatory precipitation to wet the earth's surface. If dry, this surface is so absorbent that even the heaviest rains are insufficient to produce large run-off. With the drainage area already saturated from previous precipitation, the same high intensities produce run-off that concentrates in the stream channels to form excessive floods. Sometimes, snow from previous storms, melting in contact with warm rains, augments the run-off from the later storm. For these reasons, the precipitation that has taken place prior to any date in a season markedly influences the expectancy of floods, and, since each season has its own peculiar number, intensity and sequence of storms, the flood expectancy varies on like dates of different seasons.

These investigations have searched for an index of the degree of preparedness of drainage areas necessary for turning off large floods. Since the varying intervals between storms dry up the ground surface to a different extent, the amount of precipitation that precedes floods is variable. An examination of the records shows that large floods have occurred only with very substantial preparatory precipitation. The following table shows the seasonal precipitation at the stations* used in conjunction with the analysis of run-off records, prior to the date of the largest floods on each of the four illustrative streams. The rainfall is expressed both in inches depth and in per cent of that of a normal season up to the date of the flood. (Season commencing on July 1.)

* These are the principal rainfall stations in the precipitation divisions in which the drainage areas lie. See Chap. II, Bul. No. 5, "Flow in California Streams." Here the State was divided into twenty-six areas, called "precipitation divisions," in each of which the rainfall at the various stations has approximately like characteristics when expressed in relation to its normal although the actual rain in inches at the several stations may be very different. The rain in inches at the selected stations is much less than on the drainage areas for they are all at accessible locations of low elevation.

PRECIPITATION PRIOR TO FLOOD OCCURRENCE.

Sacramento River					Mokelumne River									
					Rain-water floods					Snow-water floods				
Size of flood near Red Bluff—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Red Bluff rainfall station		Size of flood near Clements—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Electra rainfall station		Size of flood near Clements—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Electra rainfall station	
In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal	In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal	In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal
102	254,000	Feb. 3, 1909	18.58	128	94	16,700	Jan. 30, 1911	21.94	132	49	8,740	June 12, 1906	42.28	130
100	249,000	Feb. 2, 1915	17.05	119	86	15,310	Mar. 19, 1907	37.39	142	45	8,030	June 18, 1911	47.78	146
79	196,000	Mar. 20, 1907	23.05	114	62	11,100	Jan. 26, 1914	23.79	151	45	7,970	June 3, 1922	31.29	97
76	188,000	Jan. 16, 1909	11.47	97	58	10,400	Jan. 14, 1909	10.32	79	45	7,960	June 12, 1911	47.78	147
76	188,000	Feb. 16, 1904	15.99	98	55	9,850	Feb. 21, 1914	28.59	134	44	7,880	June 6, 1911	47.75	147
71	177,000	Jan. 21, 1909	13.05	104	54	9,700	Feb. 6, 1925	13.87	76	44	7,770	May 31, 1922	31.29	97
71	176,000	Feb. 25, 1917	12.43	71	52	9,250	Jan. 1, 1914	9.35	94	44	7,750	June 1, 1915	34.43	106
64	160,000	Feb. 21, 1914	26.83	158	47	8,400	Jan. 21, 1909	19.47	133	43	7,670	May 18, 1922	30.81	97
61	151,000	Jan. 1, 1914	14.76	157	45	8,040	Mar. 20, 1916	30.54	115	43	7,600	June 16, 1906	42.28	130
61	151,000	Feb. 24, 1902	18.54	107	44	7,860	Feb. 2, 1907	24.01	139	42	7,550	June 10, 1917	29.14	89
59	147,000	Mar. 8, 1904	20.86	110	43	7,750	Mar. 31, 1906	31.89	112	42	7,500	May 24, 1911	47.71	149
56	140,000	Feb. 10, 1902	13.88	90	43	7,610	Mar. 23, 1907	44.05	163	42	7,480	July 4, 1906	[2]42.60	130
55	137,000	Mar. 31, 1906	25.53	120	42	7,470	Jan. 22, 1914	20.22	137	39	6,960	June 22, 1906	42.58	130
55	136,000	Jan. 19, 1906	8.71	71	41	7,350	Jan. 18, 1921	17.42	125	39	6,960	June 2, 1907	49.41	152
54	134,000	Feb. 4, 1907	16.82	115	41	7,210	Mar. 7, 1911	37.12	153	38	6,850	June 20, 1906	42.58	130
53	131,000	Jan. 25, 1903	14.81	112	40	7,200	Nov. 21, 1909	6.75	188	38	6,800	June 2, 1909	38.95	120
52	130,000	Mar. 7, 1911	19.62	104	40	7,060	Feb. 11, 1919	13.47	70	38	6,750	May 7, 1906	37.71	120
51	128,000	Jan. 27, 1896	11.79	87	39	6,960	Jan. 19, 1906	12.60	89	38	6,700	June 8, 1915	34.43	106
49	123,000	Mar. 8, 1900	17.84	94	39	6,940	Mar. 12, 1918	16.60	66	37	6,640	May 9, 1906	37.71	120
49	122,000	Jan. 22, 1914	21.32	168	39	6,910	Apr. 16, 1925	30.28	101	37	6,630	May 13, 1915	32.13	102

[1]Precipitation includes all rainfall from July 1st to morning of the day before the flood.

PRECIPITATION PRIOR TO FLOOD OCCURRENCE.

San Joaquin River										San Gabriel River				
Rain-water floods					Snow-water floods									
Size of flood near Friant—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Fresno rainfall station		Size of flood near Friant—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Fresno rainfall station		Size of flood near Azusa—greatest daily rate of flow		Date of flood	Precipitation prior to flood,[1] Claremont rainfall station	
In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal	In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal	In per cent of once-in-25-year flood	In second-feet		In inches	In per cent of normal
109	38,800	Jan. 31, 1911	4.67	97	65	23,100	June 13, 1911	11.80	123	116	22,300	Jan. 18, 1916	11.73	156
78	27,900	Dec. 31, 1909	23.58	[2]155	64	22,800	June 4, 1909	9.79	103	83	16,000	Dec. 19, 1921	2.84	71
75	26,800	Jan. 14, 1909	3.09	79	60	21,500	June 16, 1911	11.80	123	65	12,500	Jan. 1, 1910	8.15	157
75	26,800	Dec. 10, 1909	17.53	[3]167	55	19,500	July 7, 1911	[2]11.80	123	61	11,800	Feb. 20, 1914	17.05	146
69	24,700	Jan. 26, 1914	7.05	157	47	16,700	June 5, 1922	10.71	113	58	11,130	Mar. 12, 1905	12.29	85
53	18,900	Jan. 21, 1909	3.70	88	46	16,200	May 22, 1911	11.80	126	49	9,430	Mar. 26, 1906	16.58	102
53	18,800	Mar. 8, 1911	8.24	119	46	16,200	June 6, 1911	11.80	124	48	9,160	Mar. 10, 1911	17.74	126
38	13,600	May 10, 1911	9.91	142	46	16,200	May 8, 1909	9.79	108	48	9,150	Jan. 26, 1914	9.94	118
35	12,500	Feb. 12, 1909	8.04	146	44	15,700	June 2, 1914	10.81	114	43	8,200	Feb. 9, 1922	18.71	180
33	11,700	Feb. 21, 1917	5.73	96	43	15,300	June 5, 1912	7.34	77	42	8,020	Mar. 12, 1906	9.50	66
33	11,600	Apr. 6, 1911	10.83	130	42	14,900	June 15, 1909	9.79	102	41	7,940	Jan. 27, 1916	18.15	209
31	11,000	Jan. 18, 1916	5.66	138	41	14,700	June 27, 1911	11.80	123	37	7,100	Feb. 7, 1909	13.26	133
31	11,000	Mar. 21, 1916	11.12	146	41	14,700	May 31, 1922	10.71	113	35	6,810	Mar. 5, 1907	19.97	148
31	10,900	Oct. 2, 1918	0.53	177	41	14,600	June 24, 1909	9.87	103	31	5,920	Apr. 1, 1903	19.78	[4]88
30	10,700	Jan. 25, 1911	3.06	68	39	14,000	June 11, 1909	9.79	102	31	5,900	Dec. 27, 1921	12.36	263
29	10,400	Apr. 5, 1914	10.22	125	39	13,800	June 9, 1915	10.92	114	27	5,260	Jan. 29, 1911	6.07	69
28	9,910	Feb. 21, 1914	9.04	151	38	13,500	June 1, 1915	10.92	115	27	5,110	Jan. 18, 1914	7.90	107
26	9,150	Mar. 5, 1916	10.23	153	38	13,400	June 10, 1917	7.25	76	26	5,030	Mar. 11, 1918	9.44	66
25	8,900	Jan. 18, 1914	4.90	120	38	13,400	May 25, 1922	10.71	114	24	4,670	Jan. 10, 1907	12.12	189
24	8,720	Mar. 4, 1911	7.93	120	37	13,300	July 18, 1911	[2]11.80	123	22	4,220	Jan. 31, 1911	9.26	102

[1] Precipitation includes all rainfall from July 1st to morning of the day before the flood.
[2] Precipitation from July 1st of previous year.
[3] Rainfall records at Summerdale.
[4] Rainfall records at Sierra Madre.

The foregoing tables show that the largest floods of record on the four illustrative streams occurred with the per cent of normal rainfall up to the day of the flood, varying from 97 to 156, and the second largest floods from 71 to 155. Of the twenty largest floods of record, those on the Sacramento occurred with rainfall varying from 71 to 168 per cent of normal; those on the Mokelumne, from 76 to 163 per cent of normal; those on the San Joaquin, from 77 to 167 per cent of normal; and those on the San Gabriel, from 66 to 263 per cent of normal. Therefore, it is seen that precipitation, at least in amount equivalent to a substantial part of that for a normal season, preceded all the large floods of record on the four illustrative streams. In 71 per cent of the instances tabulated above, the seasonal precipitation up to the date of the flood was larger than that for a normal season up to the same date. Although it is evident from these figures that the per cent of normal rainfall up to any date in a season is an extremely approximate indication of the degree of preparedness of a drainage area for turning off floods, nevertheless, in conjunction with another element of the analysis, it was found to have a practical value greater than any other index of a simple nature. This other element is the approach, in any part of a season, to the limit of rain-producing capacity of weather sequences.

It is a matter of common observation that sunshine, clouds, winds and rain follow one another in various complicated sequences. The state of the weather on any day is known to be the result of preceding atmospheric events over a large territory combining with the seasonal cycles peculiar to each geographic location. Many actions and reactions have followed one another in finally producing the resulting weather on any particular day. The intensity and duration of rain storms are a product of these intricate sequences. They are limited in value by the reactions to their occurrence which induce succeeding states of weather other than rain.

An inspection of precipitation records is convincing that these reactions are effective in limiting both the intensity and duration of storms, for the large values appear in the records only occasionally, less often as they become larger. A conception of the capacity of weather sequences to produce precipitation in unusual amounts may be gained by comparing the total season's precipitation of the largest years with that of a normal season. If these sequences had unlimited capacity to produce precipitation it would show in correspondingly large departures from normal in the season's rain. The following tabulation of the five seasons of greatest precipitation at the rainfall stations used in conjunction with the run-off records of the four illustrative streams shows only two instances of the seasonal precipitation exceeding twice the normal. Therefore, it would seem reasonable that the approach toward the limit of precipitation producing capacity at any time during the season might be measured approximately by the degree of normalcy of the precipitation at that time. Thus, when the precipitation at any time approaches, say, twice that of a normal season up to the same date, it would seem reasonable that there would be small likelihood of additional heavy storms because of the exceptionally large amount of precipitation that must have already occurred to place the season so far ahead of normal. Such a measure would necessarily lack accuracy during the first few months of the rainy season while the value of normal precipitation is a small quantity. Until the season progresses

sufficiently for normal precipitation to date to become a substantial quantity, it is a poor base for comparison because the relative value is considerably affected by small amounts of additional precipitation. For the greater part of the season, however, normal precipitation to date affords a convenient base with which to compare the precipitation of the current season.

FIVE SEASONS OF LARGEST PRECIPITATION AT U. S. WEATHER BUREAU STATIONS.

Red Bluff, 1877-1921		Electra, 1904-1921		Fresno, 1881-1921		Claremont, 1891-1921	
Season	Precipitation in per cent of normal	Season	Precipitation in per cent of normal	Season	Precipitation in per cent of normal	Season	Precipitation in per cent of normal
1877–78	215	1906–07	156	1885–86	202	1913–14	160
1889–90	169	1910–11	146	1883–84	194	1906–07	136
1885–86	142	1905–06	130	1894–95	152	1915–16	135
1914–15	141	1908–09	119	1905–06	140	1892–93	131
1905–06	140	1913–14	117	1889–90	135	1894–95	127

For convenience, the ratio of the actual precipitation up to any date in a season to the normal amount up to the same date (season commencing July 1), has been named the "Progressive Rainfall Index" because its value changes daily as the season progresses. Plate VI, "Progressive Rainfall Index at Time of Flood Flow," displays the values* of this index at the time of every recorded flood on the four illustrative streams. Each dot on the graph represents one flood and shows its greatest 24-hour rate of discharge on the vertical scale and the value of the "progressive rainfall index" on the other. All floods of record are plotted.

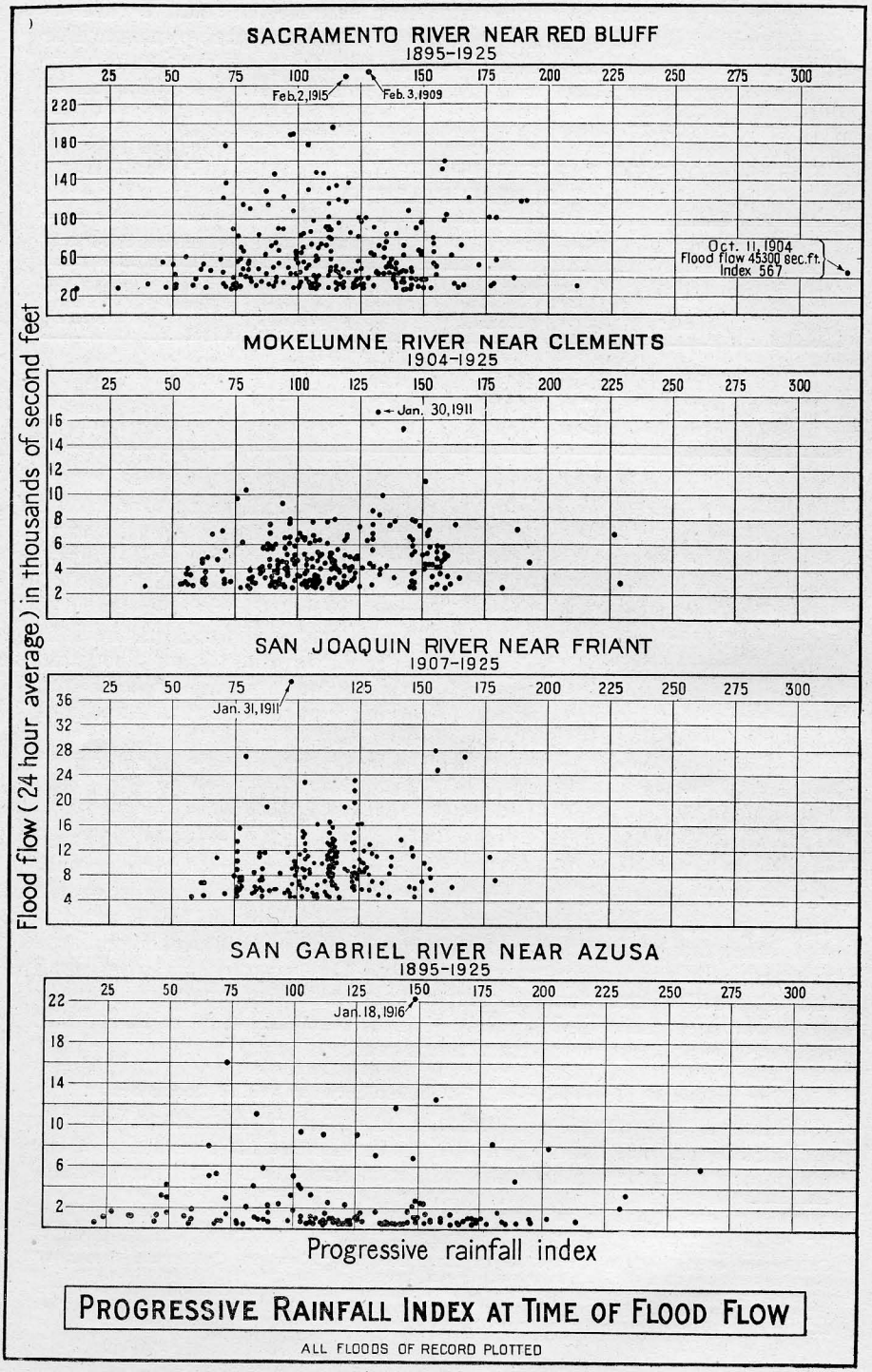
It may be observed on this plate that, of all the floods of record on these four typical streams, those within the highest quarter on the discharge scale occurred with values of the progressive rainfall index lying between 90 and 150; those within the third quarter occurred with indices between 70 and 180; those within the second quarter with indices between 50 and 270; and those within the lowest quarter on the discharge scale with indices between values of 10 and 567. Thus, it is seen that the great floods do not occur with either small or large values of the progressive rainfall index. On the one hand, the small index values witness lack of preparatory precipitation, while, on the other hand, the large index values witness that the heavy rains for that part of the season have already taken place.

Limiting values of progressive rainfall index between which floods occur.

Although the progressive rainfall index, by its nature, can be neither an accurate index of conditions on the drainage area nor of the temporary approach in any part of the season to the limit of the rain-

* The values of the index for each stream were computed from the records at the principal rainfall station in the precipitation division in which the drainage area lies. These precipitation divisions are defined by the analysis of precipitation in California contained in Chap. II of Bul. No. 5, "Flow in California Streams." Here the state was divided into twenty-six areas, called "precipitation divisions," in each of which the rainfall at the various stations has approximately like characteristics when expressed in relation to its normal although the actual rain in inches at the several stations may be very different.

PLATE VI.

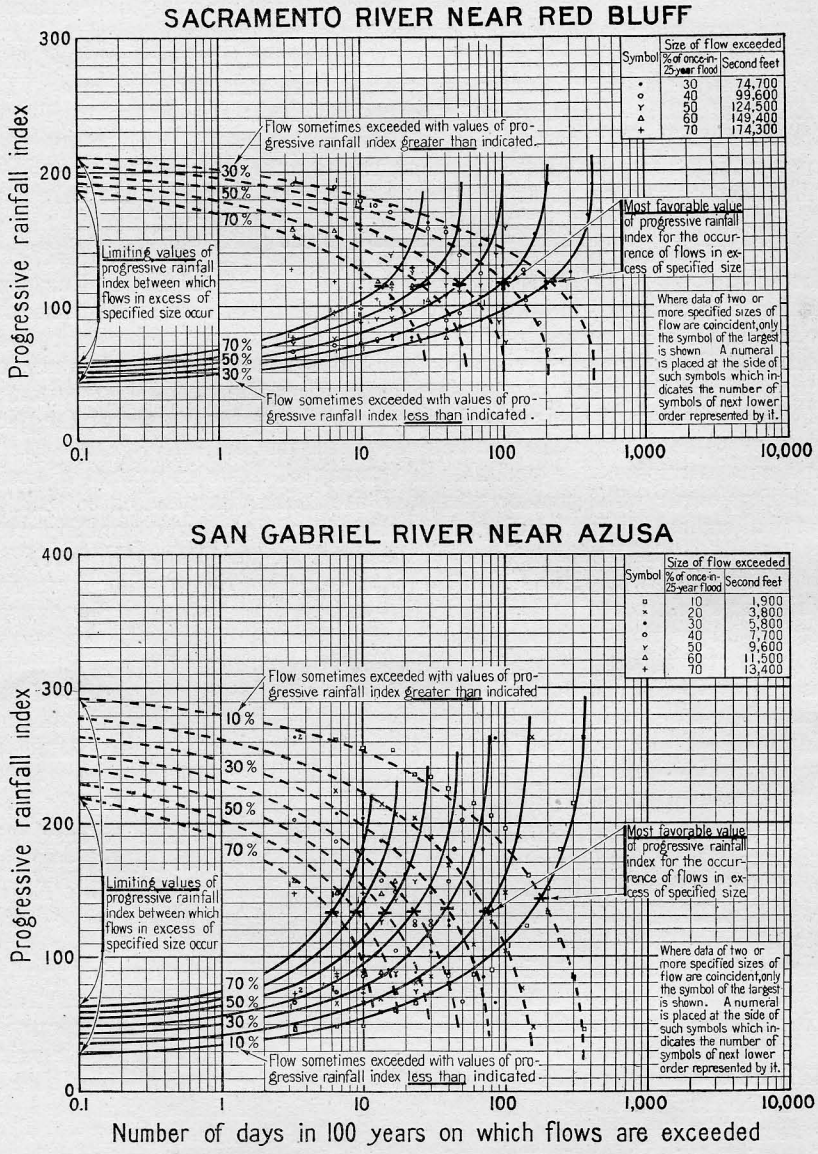

SACRAMENTO RIVER NEAR RED BLUFF
1895-1925
Feb. 2, 1915
Feb. 3, 1909
Oct. 11, 1904
Flood flow 45300 sec. ft.
Index 567
MOKELUMNE RIVER NEAR CLEMENTS
1904-1925
Jan. 30, 1911
SAN JOAQUIN RIVER NEAR FRIANT
1907-1925
Jan. 31, 1911
SAN GABRIEL RIVER NEAR AZUSA
1895-1925
Jan. 18, 1916
Flood flow (24 hour average) in thousands of second feet
Progressive rainfall index
PROGRESSIVE RAINFALL INDEX AT TIME OF FLOOD FLOW
ALL FLOODS OF RECORD PLOTTED

producing capacity of weather sequences, nevertheless, it was found that there are limiting values with which flows of the various sizes occur and that the probability of their occurrence with values beyond these limits is too remote for practical considerations. To define these limiting values of index for the various size flows, an analysis was made of the frequency with which flows of greater-than-specified sizes have occurred in the past with varying index values. The results of this analysis for the four illustrative streams are drafted on Plates VII, VIII and IX, "Relation of Progressive Rainfall Index to Flood Occurrence." The construction of these plates, as well as the analyses upon which they are based, is identical to that of Plates IV and V, "Relation of Time of Year to Flood Occurrence," except that values of the progressive rainfall index are substituted for days of the year.

On the diagrams of Plates VII, VIII and IX, each pair of curves, one dotted and one full-line, represents a specified rate of flow. For convenience in comparison between streams, the rate of flow is expressed in relation to that of a once-in-25-year flood. A conversion table to second-feet is in the upper right corner of each diagram. The full-line curves approximate the trend of the data expressing the probable frequency of flows in excess of their size that occur with smaller values of the progressive rainfall index than indicated on the vertical scale. The dotted-line curves express the probable frequency of flows in excess of their size that occur with greater values of the index than indicated on the vertical scale. As in the diagrams constructed in a corresponding way to determine the limiting dates of the flood season (Plates IV and V), the curves are well defined by the data only for the smaller flows for which more data are contained in the stream flow records. The curves for the larger flows were drafted largely by comparison with the better defined curves for the smaller ones. Although the analysis delineated on Plates VII, VIII, and IX can not be said to be exact because of the limited amount of information relating to the larger floods, an examination of the similar trend of the data on the several streams investigated, is convincing that the results are substantially correct to the extent that the future will repeat the past.

By way of illustrating the interpretation of these plates, reference is made to the upper figure on Plate VII which shows the relation of the progressive rainfall index to flood occurrence in the Sacramento River near Red Bluff. Following up the vertical line labeled 1 on the horizontal frequency scale to intersection with the pair of 50 per cent curves, it is seen that the intersection with the full-line curve is opposite a value of 58 on the scale of progressive rainfall index to the left. This means that, on one day in 100 years, flows will probably occur in excess of 50 per cent of a once-in-25-year flood with a progressive rainfall index value smaller than 58. Following the vertical line labeled 1 on the horizontal scale to intersection with the dotted-line curve, it is seen that the intersection lies opposite 188 on the scale of progressive rainfall index to the left. This means that, on one day in 100 years, flows will probably occur in excess of 50 per cent of a once-in-25-year flood with a progressive rainfall index value greater than 188. The values 58 and 188 are then the limiting values with which such floods occur with a probability of exceptional behavior of one day in a hundred years.

PLATE VII.

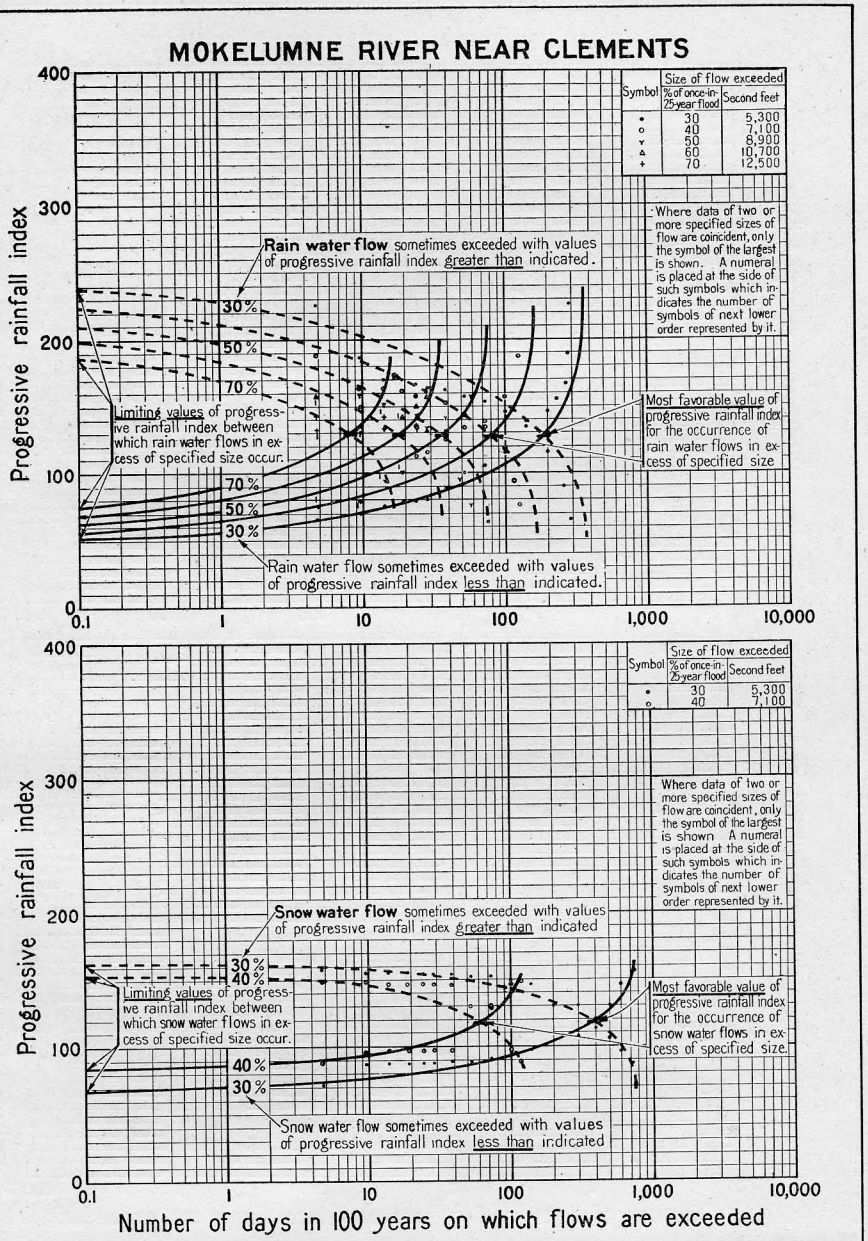


RELATION OF PROGRESSIVE RAINFALL INDEX TO FLOOD OCCURRENCE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH FLOWS OCCUR IN EXCESS OF SPECIFIED SIZE WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Flows expressed in per cent of greatest daily rate of flow of once-in-25-year flood

PLATE VIII.

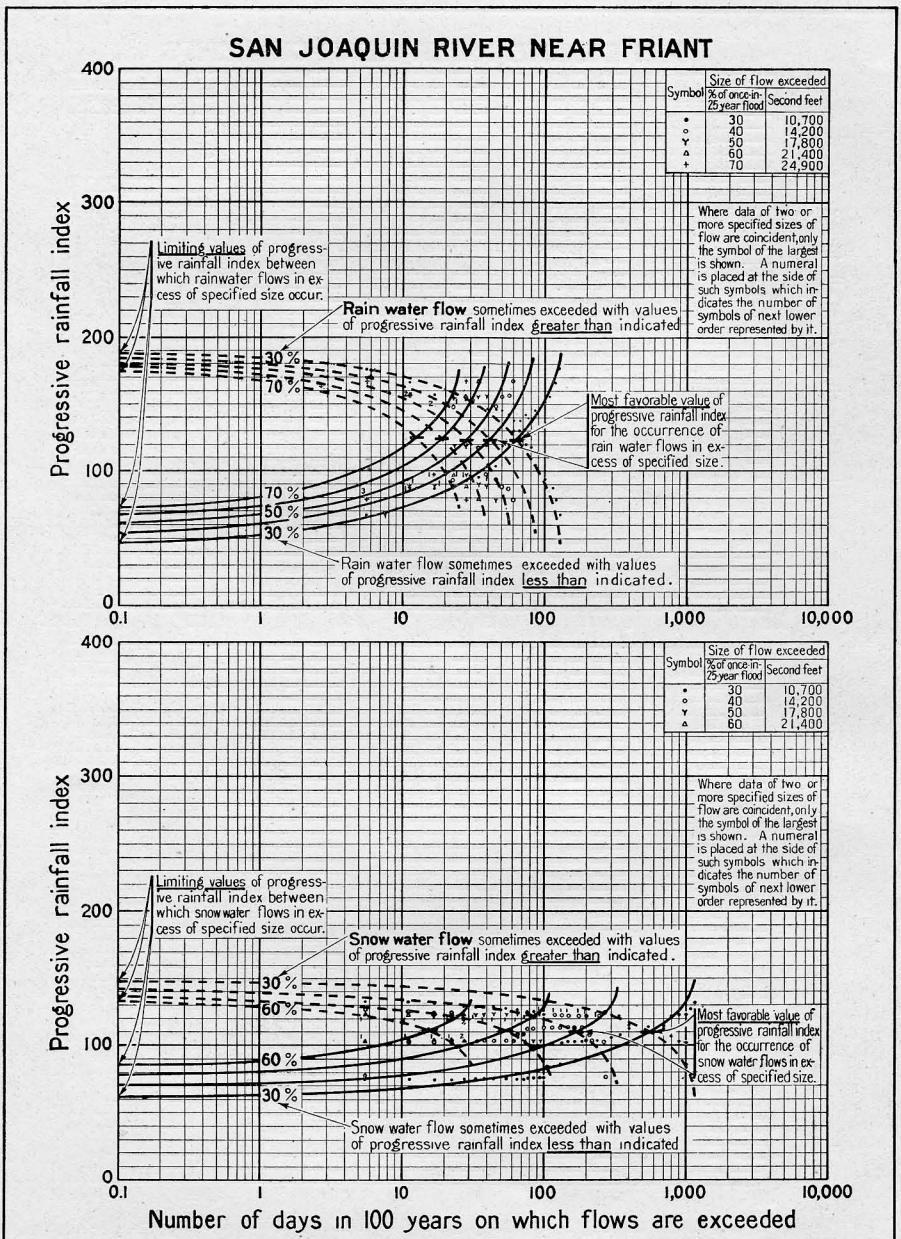


RELATION OF PROGRESSIVE RAINFALL INDEX TO FLOOD OCCURRENCE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH FLOWS OCCUR IN EXCESS OF SPECIFIED SIZE WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Flows expressed in per cent of greatest daily rate of flow of once-in-25-year flood

PLATE IX.



RELATION OF PROGRESSIVE RAINFALL INDEX TO FLOOD OCCURRENCE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH FLOWS OCCUR IN EXCESS OF SPECIFIED SIZE WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Flows expressed in per cent of greatest daily rate of flow of once-in-25-year flood

ALEXANDER

The data from which these curves (Plates VII, VIII and IX) were constructed are largely included within frequencies greater than four days in a hundred years. The frequency of four days in a hundred years represents one occurrence during the period of 25 years of measurement, the length of the longer records. Knowledge of expectancies had records been kept for greater lengths of time, may be obtained by extending these curves into the zones of smaller frequencies. In so doing, information is gained of the probability of flood occurrence with indices greater or less than the limiting values shown in the records themselves. The limiting values between which any specific flow occurs are indicated on the diagrams by the extremities of the intercept on any vertical line made by the two curves of the pair representing that specific flow. The limiting values of the index are read on the index scale to the left, opposite the extremities of the intercept. The frequency of greater flows occurring with larger or smaller values of the index than there indicated, is read on the horizontal frequency scale where it is cut by the vertical intercepted by the pair of curves. The intercept on the vertical at the extreme left of the diagrams, labeled 0.1 on the frequency scale, gives the limiting values of indices with which flows greater than specified will probably occur either with an index greater than the upper limit or with an index smaller than the lower limit except on one day in a thousand years. The intercepts on verticals representing greater frequencies of exceptional behavior become smaller as the frequencies become larger. These smaller intercepts indicate a lesser range of index values with which flows occur greater than specified.

The following tables set forth the range of index values indicated by Plates VII, VIII and IX, within which floods greater than various specific sizes will probably occur on the four illustrative streams. The maximum and minimum values are tabulated for several different frequencies of exceptional occurrence.

It may be observed, on reviewing these tables, that the smallest limiting value of the progressive rainfall index therein is 28 and the largest is 293, both for the San Gabriel River. The extreme values for the other streams are 51 and 239 on the Mokelumne, 43 and 211 on the Sacramento, and 46 and 189 on the San Joaquin River. The least values with which rain-water floods of corresponding size (equal per cent of once-in-25-year flood) occur, differ not more than 33 points on the four illustrative streams while the maximum values differ not more than 75 points. The smallest floods tabulated occur with minimum indices from 15 to 66 points smaller than the minimum indices for the largest floods and with maximum indices from 14 to 115 points larger than the maximum indices for the largest floods. For decreasing the probability from one day in 10 years to one day in 1000 years that flows in excess of those specified will not occur with either smaller or larger values of the index than indicated, the minimum value of the index may be reduced as much as 58 points and the maximum value increased as much as 87 points. The range of index values with which floods occur from rapidly melting snow is seen to be less variable than for rain-water floods. Of the two illustrative streams having snow-water floods, the smallest value of the index with which they occur is 61 and the largest is 163. The minimum values on the two streams differ not more than 16 points and the maximum not more than 15 points.

SACRAMENTO RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX BETWEEN WHICH FLOODS OCCUR.

Size of flood near Red Bluff—greatest daily rate of flow		Minimum index values					Maximum index values				
		Frequency with which flows occur with progressive rainfall index* **less** than values tabulated					Frequency with which flows occur with progressive rainfall index* **greater** than values tabulated				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
30	74,700	43	48	52	57	64	211	203	198	192	183
40	99,600	47	53	57	62	71	204	196	191	185	173
50	124,500	51	58	62	69	80	198	188	182	174	160
60	149,400	55	63	69	77	91	192	179	171	161	143
70	174,300	58	69	76	86	103	187	169	160	148	125

*At Red Bluff rainfall station.

MOKELUMNE RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX BETWEEN WHICH FLOODS OCCUR.

Size of flood near Clements—greatest daily rate of flow		Minimum index values					Maximum index values				
		Frequency with which flows occur with progressive rainfall index* **less** than values tabulated					Frequency with which flows occur with progressive rainfall index* **greater** than values tabulated				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	5,300	51	56	59	64	71	239	227	221	214	202
40	7,100	57	65	69	75	84	225	212	205	197	183
50	8,900	63	72	78	85	98	211	197	190	180	164
60	10,700	69	80	88	97	113	199	184	176	165	146
70	12,500	75	90	100	112	.....	187	169	160	147	.....
					Snow-Water Floods.						
30	5,300	68	71	72	74	77	163	162	161	160	158
40	7,100	84	87	89	90	94	154	153	152	150	146

*At Electra rainfall station.

SAN JOAQUIN RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX BETWEEN WHICH FLOODS OCCUR.

Size of flood near Friant—greatest daily rate of flow		Minimum index values					Maximum index values				
		Frequency with which flows occur with progressive rainfall index* less than values tabulated					Frequency with which flows occur with progressive rainfall index* greater than values tabulated				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	10,700	46	53	58	63	73	189	185	182	178	170
40	14,200	54	61	66	72	83	185	180	177	173	162
50	17,800	61	68	73	79	93	181	176	173	167	154
60	21,400	67	75	80	87	103	178	172	168	161	144
70	24,900	72	81	87	96	117	175	168	162	153	133
					Snow-Water Floods.						
30	10,700	61	63	64	66	69	149	147	146	145	143
40	14,200	70	72	73	75	79	142	139	138	136	134
50	17,800	78	81	83	85	90	137	133	132	130	126
60	21,400	85	89	92	96	105	133	128	126	123	116

*At Fresno rainfall station.

SAN GABRIEL RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX BETWEEN WHICH FLOODS OCCUR.

Size of flood near Azusa—greatest daily rate of flow		Minimum index values					Maximum index values				
		Frequency with which flows occur with progressive rainfall index* less than values tabulated					Frequency with which flows occur with progressive rainfall index* greater than values tabulated				
In per cent of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
10	1,900	28	35	39	45	55	293	280	274	266	253
20	3,800	36	43	48	53	64	278	261	253	242	222
30	5,800	43	50	56	63	77	264	246	235	222	198
40	7,700	49	57	62	72	93	251	231	219	204	177
50	9,600	55	63	71	83	113	240	217	203	186	153
60	11,500	59	69	78	95	.....	229	202	188	169	.....
70	13,400	64	75	86	111	.....	220	188	172	151	.....

*At Claremont rainfall station.

Most favorable value of progressive rainfall index for flood occurrence.

It has been observed that there are limiting values of the progressive rainfall index with which floods occur. Plates VII, VIII and IX, "Relation of Progressive Rainfall Index to Flood Occurrence," delineate the frequency of the exceptional occurrence of flows outside of either of these limits. Pairs of curves are drafted on these plates, one dotted and one full-line, representing this exceptional behavior of flows exceeding specified amounts. The full-line curves show the probable frequency

of occurrence of greater-than-specified flows with index values smaller than indicated, while the dotted-line curves show the probable frequency of occurrence with index values larger than indicated on the vertical scale. The two curves of each pair approach each other as these frequencies increase, until their intersection indicates a value of the progressive rainfall index with which greater-than-specified flows occur equally frequent with either smaller or larger values of the index. This is the index value with which flows greater than specified occur most frequently since the frequency of occurrence with either smaller or larger values is the same. Therefore, the values of the progressive rainfall index indicated by the intersections of these pairs of curves, are the most favorable values for flood occurrence.

The following table contains the most favorable index values for the occurrence of flows of greater-than-specified sizes on the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers as taken from Plates VII, VIII and IX. It may be noted that the values range from 114 to 143 for rain-water floods, being least for the Sacramento River and largest for the San Gabriel. On the San Joaquin River the values for the several sizes vary only one point while on the Mokelumne the variance is two, on the Sacramento four and on the San Gabriel twelve points. The most favorable values for snow-water flows on the Mokelumne and San Joaquin rivers, are smaller than for rain-water flows. On the Mokelumne this value is 118, while on the San Joaquin it is 110-111.

MOST FAVORABLE VALUE OF PROGRESSIVE RAINFALL INDEX FOR FLOOD OCCURRENCE.

Size of flood		Mokelumne River		San Joaquin River		
In per cent of greatest daily rate of flow of once-in-25-year flood	Sacramento River	Rain-water floods	Snow-water floods	Rain-water floods	Snow-water floods	San Gabriel River
10	.....	.....	.....	.....	.....	143
20	.....	.....	.....	.....	.....	136
30	118	127	118	124	110	137
40	117	128	118	124	110	134
50	117	129	.....	124	110	134
60	114	129	.....	124	111	134
70	114	129	.....	125	.....	133

Relation of flood occurrence to season's run-off.

It has been pointed out through analyses of stream flow records, that the most favorable time for flood occurrence, except from melting snow, is in mid-winter. Thus, it would be expected that the largest and heaviest floods occur during the middle of the rainy season followed by a considerable part of the season's total precipitation and hence a considerable part of the season's run-off. Therefore, since large floods usually occur in seasons of greater than normal run-off, the stream flow subsequent to them should be a substantial fraction of that for a normal season.

The following table presents the run-off in the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers subsequent to the

largest floods on record. The run-off is expressed in per cent of the total run-off for an average season. It may be noted that the run-off subsequent to the largest floods of record on the Sacramento River averaged 80 per cent of the total for a normal season, on the Mokelumne and San Joaquin, following rain-water floods, 106 and 120 per cent, respectively, and on the San Gabriel 129 per cent of the total run-off of a normal season. The run-off subsequent to the largest snow-water floods on the Mokelumne and San Joaquin rivers was 44 and 48 per cent, respectively, of the total for a normal season. These values varied considerably with the different floods. On the Sacramento, Mokelumne and San Joaquin rivers the minimums were about half the average values, but on the San Gabriel it was about a third of the average. It is seen that, for the most part, a very substantial amount of run-off follows large floods, even the snow-water floods that occur late in the season.

RUN-OFF SUBSEQUENT TO LARGEST FLOODS OF RECORD.

Sacramento River			Mokelumne River					
			Rain-water floods			Snow-water floods		
Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[1]	Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[2]	Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[2]
254,000	Feb. 3, 1909	79.9	16,700	Jan. 30, 1911	*149.1	8,740	June 12, 1906	*50.9
249,000	Feb. 2, 1915	93.1	15,310	Mar. 19, 1907	136.9	8,030	June 18, 1911	27.4
196,000	Mar. 20, 1907	63.3	11,100	Jan. 26, 1914	101.3	7,970	June 3, 1922	*30.8
188,000	Jan. 16, 1909	114.7	10,400	Jan. 14, 1909	*118.3	7,960	June 12, 1911	36.5
188,000	Feb. 16, 1904	121.7	9,850	Feb. 21, 1914	90.3	7,880	June 6, 1911	45.2
177,000	Jan. 21, 1909	101.5	9,700	Feb. 6, 1925	80.8	7,770	May 31, 1922	37.5
176,000	Feb. 25, 1917	44.9	9,250	Jan. 1, 1914	114.6	7,750	June 1, 1915	30.3
160,000	Feb. 21, 1914	65.4	8,400	Jan. 21, 1909	110.9	7,670	May 18, 1922	53.9
151,000	Jan. 1, 1914	*113.1	8,040	Mar. 20, 1916	79.5	7,600	June 16, 1906	*45.0
151,000	Feb. 24, 1902	x58.4	7,860	Feb. 2, 1907	167.2	7,550	June 10, 1917	24.0
147,000	Mar. 8, 1904	91.3	7,750	Mar. 31, 1906	119.6	7,500	May 24, 1911	*58.3
140,000	Feb. 10, 1902	x80.9	7,610	Mar. 23, 1907	*127.0	7,480	July 4, 1906	22.4
137,000	Mar. 31, 1906	50.0	7,470	Jan. 22, 1914	106.8	6,960	June 22, 1906	37.6
136,000	Jan. 19, 1906	93.5	7,350	Jan. 18, 1921	85.1	6,960	June 2, 1907	57.6
134,000	Feb. 4, 1907	99.5	7,210	Mar. 7, 1911	*126.9	6,850	June 20, 1906	40.6
131,000	Jan. 25, 1903	63.6	7,200	Nov. 21, 1909	97.4	6,800	June 2, 1909	32.6
130,000	Mar. 7, 1911	56.6	7,060	Feb. 11, 1919	57.8	6,750	May 7, 1906	92.4
128,000	Jan. 27, 1896	77.7	6,960	Jan. 19, 1906	143.9	6,700	June 8, 1915	x19.2
123,000	Mar. 8, 1900	34.6	6,940	Mar. 12, 1918	50.1	6,640	May 9, 1906	x89.5
122,000	Jan. 22, 1914	89.6	6,910	Apr. 16, 1925	*51.8	6,630	May 13, 1915	48.7
Average value		79.6			105.8			44.0

San Joaquin River						San Gabriel River		
Rain-water floods			Snow-water floods					
Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[3]	Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[3]	Mean daily flow in second-feet	Date of flood	Subsequent run-off in per cent of mean seasonal[4]
38,800	Jan. 31, 1911	157.5	23,100	June 13, 1911	63.9	22,300	Jan. 18, 1916	125.3
27,900	Dec. 31, 1909	84.6	22,800	June 4, 1909	*51.0	16,000	Dec. 19, 1921	253.6
26,800	Jan. 14, 1909	*132.4	21,500	June 16, 1911	*56.0	12,500	Jan. 1, 1910	60.0
26,800	Dec. 10, 1909	91.2	19,500	July 7, 1911	27.8	11,800	Feb. 20, 1914	119.9
24,700	Jan. 26, 1914	126.7	16,700	June 5, 1922	45.9	11,130	Mar. 12, 1905	70.7
18,900	Jan. 21, 1909	*127.5	16,200	May 22, 1911	*90.1	9,430	Mar. 26, 1906	83.4
18,800	Mar. 8, 1911	142.9	16,200	June 6, 1911	75.8	9,160	Mar. 10, 1911	86.5
13,600	Mar. 10, 1911	*140.2	16,200	May 8, 1909	*80.5	9,150	Jan. 26, 1914	165.2
12,500	Feb. 12, 1909	*119.9	15,700	June 2, 1914	55.1	8,200	Feb. 9, 1922	135.6
11,700	Feb. 21, 1917	82.1	15,300	June 5, 1912	19.4	8,020	Mar. 12, 1906	*127.4
11,600	Apr. 6, 1911	126.2	14,900	June 15, 1909	*35.4	7,940	Jan. 27, 1916	96.7
11,000	Jan. 18, 1916	126.7	14,700	June 27, 1911	*39.2	7,100	Feb. 7, 1909	88.6
11,000	Mar. 21, 1916	104.0	14,700	May 31, 1922	54.9	6,810	Mar. 5, 1907	142.5
10,900	Oct. 2, 1918	62.5	14,600	June 24, 1909	*26.1	5,920	Apr. 1, 1903	41.1
10,700	Jan. 25, 1911	165.8	14,000	June 11, 1909	42.1	5,900	Dec. 27, 1921	208.2
10,400	Apr. 5, 1914	103.1	13,800	June 9, 1915	*36.9	5,260	Jan. 29, 1911	164.8
9,910	Feb. 21, 1914	119.0	13,500	June 1, 1915	x44.5	5,110	Jan. 18, 1914	187.8
9,150	Mar. 5, 1916	112.8	13,400	June 10, 1917	34.2	5,030	Mar. 11, 1918	58.0
8,900	Jan. 18, 1914	132.2	13,400	May 25, 1922	62.2	4,670	Jan. 10, 1907	214.1
8,720	Mar. 4, 1911	146.0	13,300	July 18, 1911	15.2	4,220	Jan. 31, 1911	156.8
		120.2			47.8			129.3

[1] Mean seasonal run-off of Sacramento River near Red Bluff (50 yr. mean) 9,929,000 acre-feet.
[2] Mean seasonal run-off of Mokelumne River near Clements (50 yr. mean) 898,000 acre-feet.
[3] Mean seasonal run-off of San Joaquin River near Friant (50 yr. mean) 2,057,000 acre-feet.
[4] Mean seasonal run-off of San Gabriel River near Azusa (50 yr. mean) 147,000 acre-feet.
*Second day after flood to October 1.
xThird day after flood to October 1.
All other values of run-off subsequent to flood are from first day after flood to October 1.

CHAPTER IV.

RESERVOIR SPACE REQUIRED TO DETAIN EXCESS FLOOD FLOWS.

Source of information.

Of all information concerning floods, that most important to their control by reservoirs is the volume of water contained in the excessive rates of flow. This is the volume that must be detained in reservoirs if the downstream flow is to be limited to reasonable rates. Information concerning the volume that must be so detained is contained in the records of stream measurement. Although the period of measurement in California is too brief for direct disclosure of either the largest floods that may occur or the length of the intervals between them, nevertheless, within these records is the sum total of accurate knowledge of the volume of flood flow. Other information, at best, is indirect and very approximate. Flood estimates based on high-water marks, on the memory of old inhabitants or rates of rainfall that have occurred in other localities, contain many elements of uncertainty. The stream-flow measurements themselves are the only direct and definite information on the volume of flood flow. This study, therefore, is confined to their analysis.

Continuous stream measurement in California was started with the establishment of the first gaging station at Jelly's Ferry on the Sacramento River in 1895. Since then many other stations have been established on the larger streams. At present, about 250 stations are maintained by the United States Geological Survey and the State of California in cooperation. From the continuous records kept at these stations, the United States Geological Survey publishes in its water-supply papers, tables of the average daily stream flow past each one of these points of measurement. The published tables, together with those in preparation for publication, have been used in the computations of this bulletin.

Method of analysis.

Since the stream-flow records cover too short a time to include the maximum flood that might occur, it is desirable to ascertain the relation between the volume of flow and frequency of its occurrence as disclosed by the many smaller floods observed during the period of record. To ascertain the volume of water contained in the excessive rates of flood flow, the records on twenty streams of the State that have been measured from seventeen to thirty years were assembled and the volume of water contained in every flood in excess of certain specified rates of flow was computed. These are the volumes of water that would have had to be detained in reservoirs to have reduced the floods of record to the specified rates of maximum flow through reservoir control. The following table enumerates the streams whose records were analysed, the names of the stream-gaging stations and the period of record:

LIST OF STREAM FLOW RECORDS ANALYZED FOR FLOOD CHARACTERISTICS.

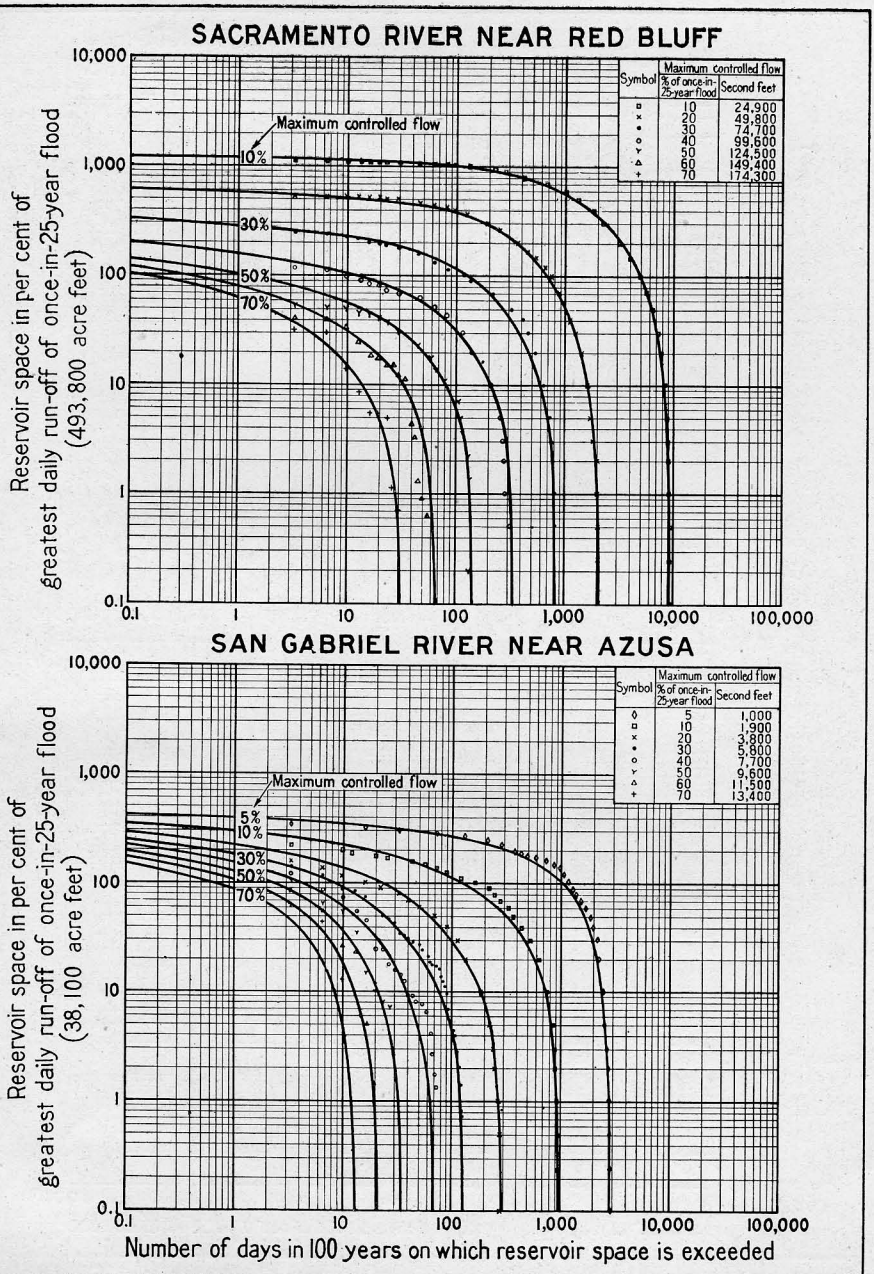
Stream	Gaging station	Drainage area in square miles	Period of record	Number of years of record
Sacramento River	Jelly's Ferry	9,093	Apr. 29, 1895-Jan. 31, 1902	30.4
Sacramento River	Red Bluff	9,258	Feb. 1, 1902-Oct. 1, 1925	
Feather River	Oroville	3,627	Jan. 1, 1902-Oct. 1, 1925	23.7
Yuba River	Smartsville	1,200	July 1, 1903-Oct. 1, 1925	22.3
Bear River	Van Trent	262	Oct. 8, 1904-Oct. 1, 1925	21.0
American River	Fair Oaks	1,919	Nov. 4, 1904-Oct. 1, 1925	20.9
Cosumnes River	Michigan Bar	534	Oct. 20, 1907-Oct. 1, 1925	17.9
Mokelumne River	Clements	632	Oct. 28, 1904-Oct. 1, 1925	20.9
Calaveras River	Jenny Lind	394	Jan. 1, 1907-Oct. 1, 1925	18.7
Stanislaus River	At Knights Ferry	983	May 19, 1903-May 1, 1916	22.4
Stanislaus River	Near Knights Ferry	973	May 1, 1916-Oct. 1, 1925	
Tuolumne River	La Grange	1,543	Aug. 30, 1895-Oct. 1, 1925	30.1
Merced River	Merced Falls	1,054	Apr. 6, 1901-Nov. 30, 1913	22.5
Merced River	Exchequer	1,020	Nov. 28, 1915-Nov., 1922	
Merced River	Exchequer	1,034	Nov., 1922-Oct. 1, 1925	
San Joaquin River	Friant	1,631	Oct. 18, 1907-Oct. 1, 1925	18.0
Kings River	Sanger	1,694	Sept. 3, 1895-Oct. 1, 1925	30.1
Kaweah River	Three Rivers	514	Apr. 29, 1903-Oct. 1, 1925	22.4
Tule River	Porterville	264	May 1, 1901-Oct. 1, 1925	24.4
Kern River	Bakersfield	2,410	Jan. 1, 1896-Oct. 1, 1925	29.8
Stony Creek	Fruto	577	Jan. 30, 1901-Oct. 5, 1912	17.4
Stony Creek	Orland	636	Jan. 1, 1920-Oct. 1, 1925	
Putah Creek	Winters	655	Oct. 1, 1905-Oct. 1, 1925	20.0
San Gabriel River	Azusa	214	Aug. 1, 1895-Oct. 1, 1925	30.2
Santa Ana River	Mentone	189	July 1, 1896-Oct. 1, 1914	29.3
Santa Ana River	Mentone	199	Oct. 1, 1914-Oct. 1, 1925	

After computing the volume of water in all flows exceeding certain specified rates, determination was made for each successive day of every flood of the empty reservoir space that would have been needed to have absorbed, through the remainder of the flood, all water in excess of the several specified rates of flow. Counts were made in each set of computations pertaining to a specified rate of controlled flow of the number of times empty space in excess of various values was needed. These counts were expanded by proportion to obtain the number of occurrences had the records been a hundred years in length. The relations disclosed by the data on the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers, the four streams selected for illustration, are shown on Plates X, XI and XII, "Reservoir Space Required to Control Floods."* These present the relations established from the data between reservoir space and the frequency with which it would be surcharged if used to detain excess flood flows.

The horizontal scale on these three plates shows the number of days in a hundred years that reservoir space in excess of the values indicated on the vertical scale would be required in a reservoir to reduce floods to the maximum rate of flow specified on the curves. For convenience of comparison between the twenty streams for which these computa-

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

PLATE X.

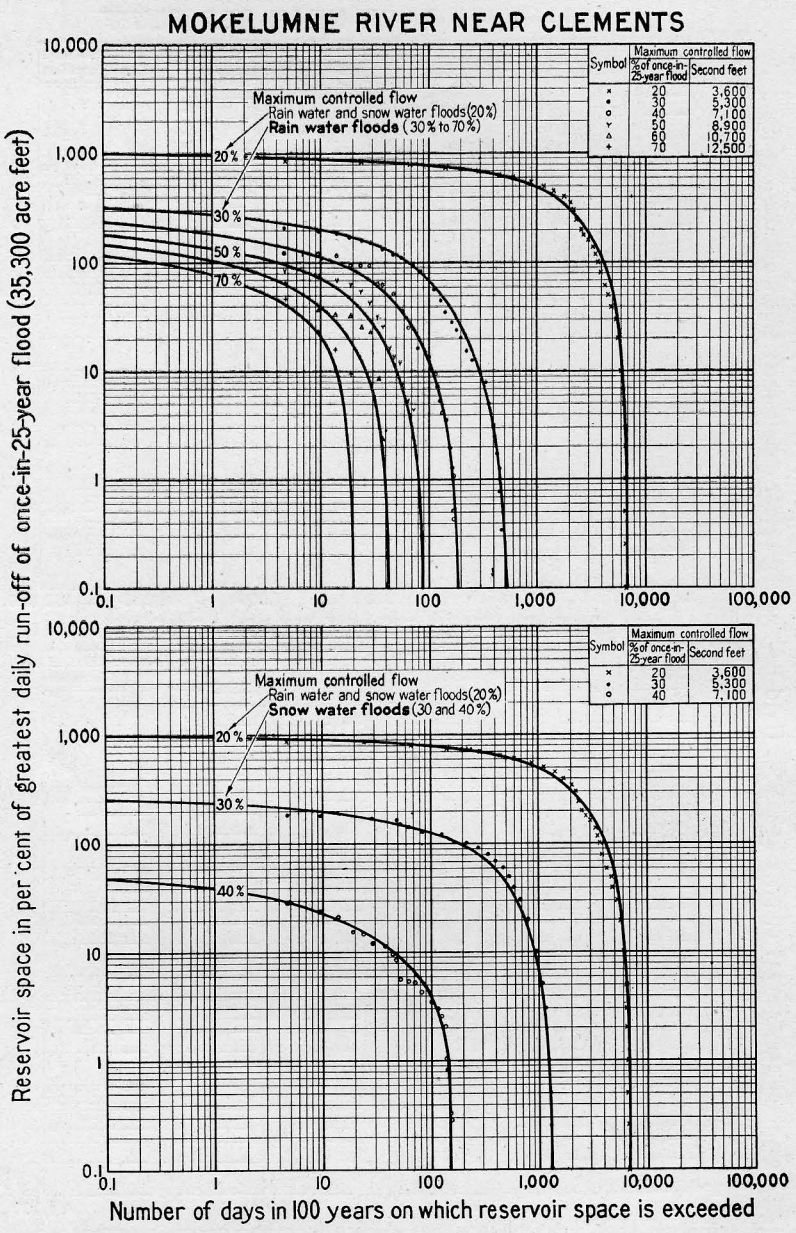


RESERVOIR SPACE REQUIRED TO CONTROL FLOODS

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RESERVOIR SPACE GREATER THAN INDICATED IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

PLATE XI.

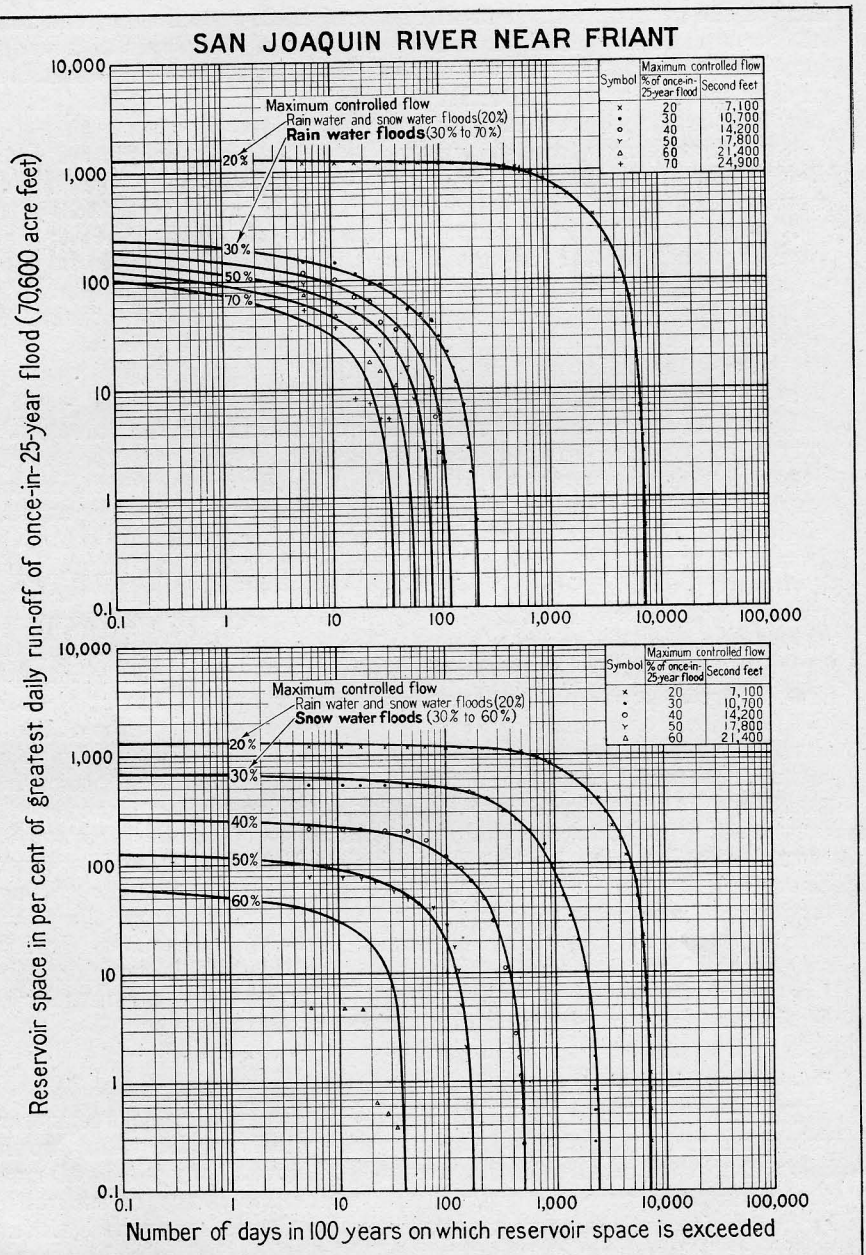


RESERVOIR SPACE REQUIRED TO CONTROL FLOODS

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RESERVOIR SPACE GREATER THAN INDICATED IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

PLATE XII.



RESERVOIR SPACE REQUIRED TO CONTROL FLOODS

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RESERVOIR SPACE GREATER THAN INDICATED IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood.

tions were made, the values of reservoir space were expressed in per cent of the greatest daily run-off of a once-in-25-year flood. The rates of flow were expressed in per cent of the greatest daily rate of flow of a once-in-25-year flood. The use of these units eliminates the dimensions of the drainage area and permits the ready comparison of data pertaining to all drainage areas, irrespective of their size.

The curves are drawn to express the trend of the plotted data. Because of the greater mass of statistics pertaining to the smaller flows, the curves relating to them are the most clearly defined by the plotted points. The curves for the larger flows are drafted by comparison with those for the smaller ones as well as with those on other streams, while at the same time conforming to the plotted points. The data on some streams plot closer to regular curves than on others. In determining the general shape of the curves greater weight was given to these data, believing that the greater regularity indicates fewer departures from a general relation.

It may be observed that the plotted data determining the parts of the curves in zones of greater frequencies on the right of the graphs depart less from the smooth curves than in the zones of smaller frequencies on the left, where the points are determined by a less number of floods. The point in each series farthest to the left is computed from the largest flood during the period of record. Although it has been regarded as having an average frequency of once in the period of record, it might well be a flood of some other frequency that happened to occur within this group of years, since the relation expressed by the curves does not take the sequence of flood sizes into account, but only the average interval of time between their occurrence. For this reason the period of record may contain single floods or even groups of floods that have actual frequencies different from those indicated by their chance occurrence within the period of record. Points representing such floods on the graphs would be expected to depart from smooth curves. The departure of points in the zones of smaller frequencies toward the left on the graphs is believed to be from this cause. Therefore, in drafting the series of curves to represent the average tendency of occurrence, they were drafted neither to average the points nor to pass through as many as possible, but rather they were drafted as curves of regular shape taking the most reasonable position relative one to the other and to the plotted points and commensurate with the indications of the data on all the other streams studied.

Relations established.

The curves of Plates X, XI, and XII show the relation between reservoir space and the probable frequency with which specific values would be surcharged if used to detain excess flood flows. They yield information upon the degree of certainty with which floods may be controlled by reservoirs and the reserve space needed for this purpose. Intersections of the curves on the extreme left vertical, indicate the reserve space that would be sufficient to detain flows in excess of the values specified on the curves for all except one day of flood in a thousand years. On this one day, the indicated reserve space would fill and water in excess of the specified maximum flow would have to be disposed of. This day may be one of either small or large flow following

close upon the great flood that filled the reserve space in the reservoir. The only information yielded by the analysis is that the reserve space would be filled to overflowing. The amount of the overflow in excess of the specified maximum discharge might take any value greater than zero with the greatest likelihood of its being among the smaller values.

Intersections of the curves with verticals other than the one on the

RESERVOIR SPACE REQUIRED TO CONTROL FLOODS.

Stream	Maximum controlled flow		Reservoir space in per cent of greatest daily run-off of once-in-25-year flood				
	In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	Exceeded one day in 1000 years	Exceeded one day in 100 years	Exceeded one day in 50 years	Exceeded one day in 25 years	Exceeded one day in 10 years
Sacramento River near Red Bluff.							
	10	24,900	1,200	1,190	1,180	1,165	1,135
	20	49,800	620	580	563	548	519
	30	74,700	320	282	267	249	223
	40	99,600	198	154	140	126	104
	50	124,500	148	105	92	78	58
	60	149,400	121	80	66	51	32
	70	174,300	102	62	48	33	16
Mokelumne River near Clements**			**Rain-Water Floods.**				
	20	*3,600	*1,000	*960	*940	*920	*900
	30	5,300	322	278	260	237	203
	40	7,100	240	189	172	151	119
	50	8,900	191	141	122	102	72
	60	10,700	153	104	87	69	42
	70	12,500	122	76	62	46	21
			Snow-Water Floods.				
	30	5,300	250	230	220	211	195
	40	7,100	50	40	36	30	23
San Joaquin River near Friant.			**Rain-Water Floods.**				
	20	*7,100	*1,320	*1,310	*1,300	*1,280	*1,260
	30	10,700	243	209	188	168	131
	40	14,200	188	154	138	122	94
	50	17,800	150	120	106	90	67
	60	21,400	123	94	81	68	48
	70	24,900	101	74	62	50	32
			Snow-Water Floods.				
	30	10,700	700	678	660	645	622
	40	14,200	270	260	250	240	222
	50	17,800	130	117	110	102	88
	60	21,400	60	51	46	40	30
San Gabriel River near Azusa.							
	5	1,000	419	390	380	370	350
	10	1,900	344	295	277	254	225
	20	3,800	287	225	200	170	134
	30	5,800	243	180	154	131	93
	40	7,700	220	150	127	102	62
	50	9,600	197	128	104	79	37
	60	11,500	173	107	85	59	19
	70	13,400	153	88	67	40	5

*Rain-water and snow-water floods.

** Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

extreme left, indicate the probable frequency with which smaller values of reservoir space would fill to overflowing while regulating to the maximum flows specified on the curves. These smaller values of reservoir space are indicated on the vertical scale opposite the intersections while the frequencies are indicated on the horizontal scale where cut by the verticals intersected.

Values determined.

The values of reserve reservoir space and the probable frequencies with which they would be filled to overflowing while controlling floods to the several specified rates are contained in the foregoing table for the four illustrative streams. The units employed are relative to a once-in-25-year flood and are identical to those used on Plates X, XI and XII.

It may be observed in the foregoing table that the relative space required to control floods is not extremely different on the several streams for control between 40 and 70 per cent of the once-in-25-year flood. For control to less than 30 or 40 per cent of the once-in-25-year flood, there is a sharp increase in the reservoir space required on the three northerly streams. On the San Gabriel, however, this sharp increase occurs for control to less than 10 or 20 per cent of the once-in-25-year flood.

On all four streams, for rain-water floods, very much greater space is required if the probability of control is raised from an average exceptional behavior of one day in 10 years to one day in 1000 years. For control to 70 per cent of the once-in-25-year flood, the space increases from 5 to 32 per cent for an average exceptional behavior on one day in 10 years to 101 to 153 per cent for average exceptional behavior on one day in 1000 years. For control to 40 per cent of the once-in-25-year flood the space increases from 62 to 119 per cent for exceptional behavior on one day in 10 years to 188 to 240 per cent for exceptional behavior on one day in 1000 years. These values increase to over 1000 per cent for control to less than 10 or 20 per cent of the once-in-25-year flood on the three northerly streams and to over 400 per cent for control to less than 5 per cent of the once-in-25-year flood on the San Gabriel.

The space required to control snow-water floods on the two illustrative streams on which they occur is less than that required to control rain-water floods except for reductions to less than 50 per cent of the once-in-25-year flood. Larger space is required to reduce the snow-water floods to these smaller rates of flow than to correspondingly reduce the rain-water floods. In general, the increase in space for gaining greater probability in control is less for snow-water floods than for those from rain.

While there is much similarity on the four illustrative streams in the relative reservoir space required for flood control, the actual space in acre-feet is very different due to the great variance in the size of the four streams. This variance in size is shown by the following table:

SIZE OF THE FOUR ILLUSTRATIVE STREAMS.

River	*Drainage area in square miles*	*Mean seasonal run-off in acre-feet*	*Maximum flood of record—mean daily flow in second-feet*
Sacramento	9,258	9,929,000	254,000
Mokelumne	632	898,000	16,700
San Joaquin	1,631	2,057,000	38,800
San Gabriel	214	147,000	22,300

The actual reservoir space in acre-feet required to control floods, corresponding to the relative values heretofore presented, are given in the following table. The maximum controlled flows are expressed in second-feet:

RESERVOIR SPACE REQUIRED TO CONTROL FLOODS.

Stream	Maximum controlled flow		Reservoir space in acre-feet				
	In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	Exceeded one day in 1000 years	Exceeded one day in 100 years	Exceeded one day in 50 years	Exceeded one day in 25 years	Exceeded one day in 10 years
Sacramento River near Red Bluff..	10	24,900	5,926,000	5,876,000	5,827,000	5,753,000	5,605,000
	20	49,800	3,062,000	2,864,000	2,780,000	2,706,000	2,563,000
	30	74,700	1,580,000	1,393,000	1,318,000	1,230,000	1,101.000
	40	99,600	978,000	760,000	691,000	622,000	514,000
	50	124,500	731,000	518,000	454,000	385,000	286,000
	60	149,400	597,000	395,000	326,000	252,000	158,000
	70	174,300	504,000	306,000	237,000	163,000	79,000
Mokelumne River near Clements**			**Rain-Water Floods.**				
	*20	3,600	353,000	339,000	332,000	325,000	318,000
	30	5,300	114,000	98,000	92,000	84,000	72,000
	40	7,100	85,000	67,000	61,000	53,000	42,000
	50	8,900	67,000	50,000	43,000	36,000	25,000
	60	10,700	54,000	37,000	31,000	24,000	15,000
	70	12,500	43,000	27,000	22,000	16,000	7,000
			Snow-Water Floods.				
	30	5,300	88,000	81,000	78,000	74,000	69,000
	40	7,100	18,000	14,000	13,000	11,000	8,000
San Joaquin River near Friant....			**Rain-Water Floods.**				
	*20	7,100	932,000	925,000	918,000	904,000	890,000
	30	10,700	172,000	148,000	133,000	119,000	92,000
	40	14,200	133,000	109,000	97,000	86,000	66,000
	50	17,800	106,000	85,000	75,000	64,000	47,000
	60	21,400	87,000	66,000	57,000	48,000	34,000
	70	24,900	71,000	52,000	44,000	35,000	23,000
			Snow-Water Floods.				
	30	10,700	494,000	479,000	466,000	455,000	439,000
	40	14,200	191,000	184,000	177,000	169,000	157,000
	50	17,800	92,000	83,000	78,000	72,000	62,000
	60	21,400	42,000	36,000	32,000	28,000	21,000
San Gabriel River near Azusa.....	5	1,000	160,000	149,000	145,000	141,000	133,000
	10	1,900	131,000	112,000	106,000	97,000	86,000
	20	3,800	109,000	86,000	76,000	65,000	51,000
	30	5,800	93,000	69,000	59,000	50,000	35,000
	40	7,700	84,000	57,000	48,000	39,000	24,000
	50	9,600	75,000	49,000	40,000	30,000	14,000
	60	11,500	66,000	41,000	32,000	22,000	7,000
	70	13,400	58,000	34,000	26,000	15,000	2,000

*Rain-water and snow-water floods.

** Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

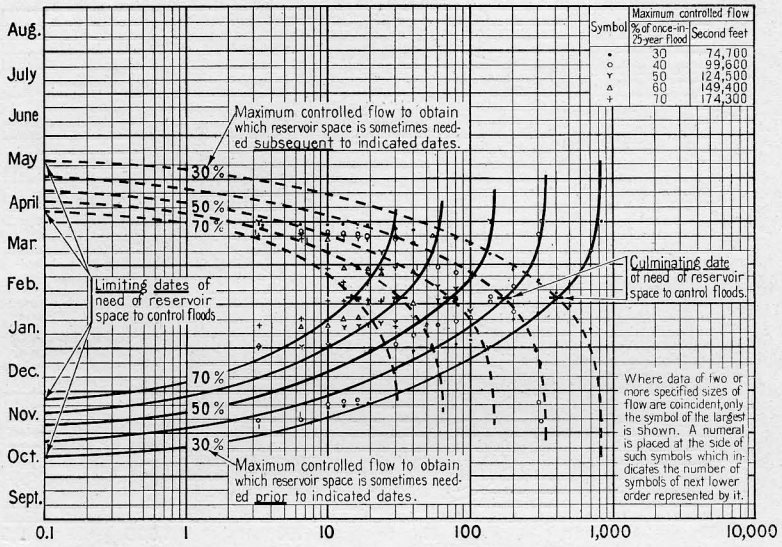
Variation in values with time of year and progressive rainfall index.

The reservoir space required to control floods deduced by the foregoing analysis is the largest that may be needed under the many circumstances of flood occurrence. It was derived from a discussion of all recorded floods regardless of the time of year or the value of progressive rainfall index with which they occurred. The reservoir space required to control floods necessarily will vary with the time of year and value of the progressive rainfall index in a way similar to the size of floods of which it is a function. This relation of reservoir space required to control floods to the time of year and value of progressive rainfall index parallels so closely that of the size of floods which is fully presented in Chapter III, pages 29 to 50, that the plates setting forth the corresponding analysis in respect to reservoir space are presented without further comment. Plates XIII and XIV, "Relation of Time of Year to Need of Reservoir Space," are constructed in an identical way to Plates IV and V, "Relation of Time of Year to Flood Occurrence (pp. 30 and 32). Likewise Plates XV, XVI and XVII, "Relation of Progressive Rainfall Index to Need of Reservoir Space," are constructed in a way identically parallel to Plates VII, VIII and IX, "Relation of Progressive Rainfall Index to Flood Occurrence" (pp. 44, 45 and 46).

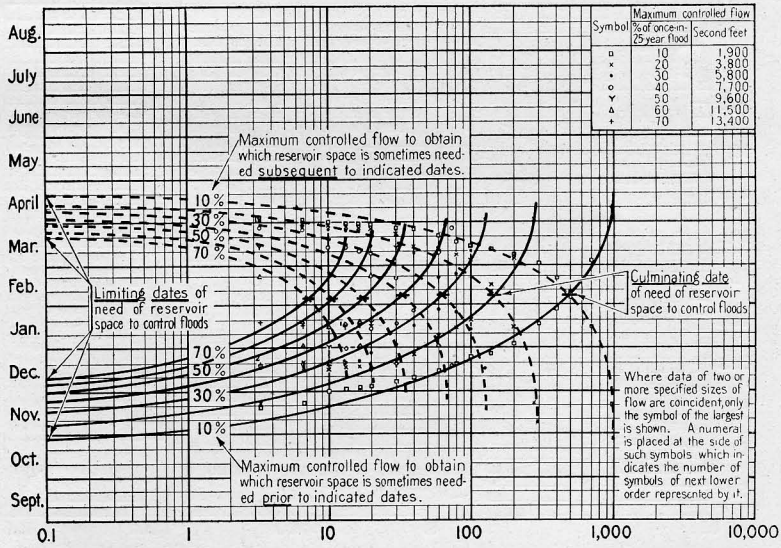
The limiting dates for the need of reservoir space to control floods on the four illustrative streams are found to vary not more than 33 days from the corresponding dates of flood occurrence (pp. 34 and 35) while the culminating dates are not more than 11 days apart. Likewise the limiting values of progressive rainfall index with which reservoir space is needed to control floods do not differ more than 16 points from the corresponding values with which floods occur and the greatest difference in the most favorable values of the index is 21 points. A complete tabulation of these dates and values of progressive rainfall index follow. These tables are parallel in every respect to those relating to flood occurrence in Chapter III (pp. 34, 35, 36, 48, 49 and 50) except that "need of reservoir space to control floods" is substituted for "flood occurrence."

PLATE XIII.

SACRAMENTO RIVER NEAR RED BLUFF



SAN GABRIEL RIVER NEAR AZUSA



Number of days in 100 years on which some reservoir space is needed

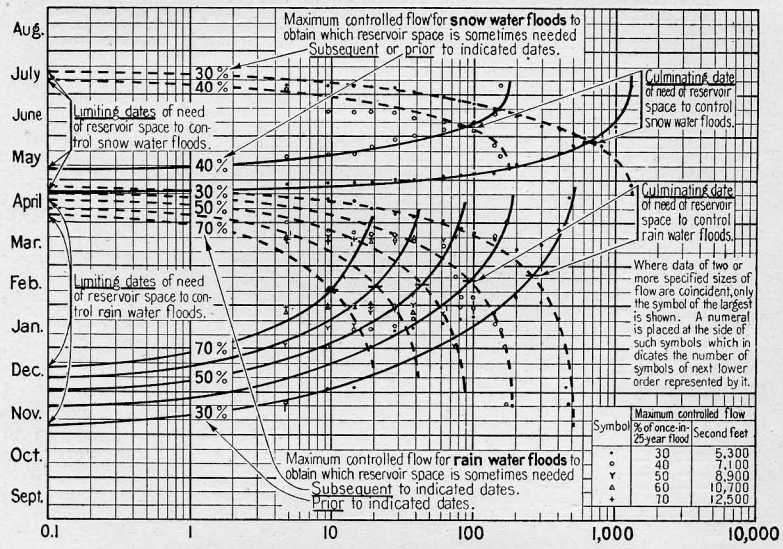
RELATION OF TIME OF YEAR TO NEED OF RESERVOIR SPACE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH SOME RESERVOIR SPACE IS NEEDED PRIOR AND SUBSEQUENT TO INDICATED DATES TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW

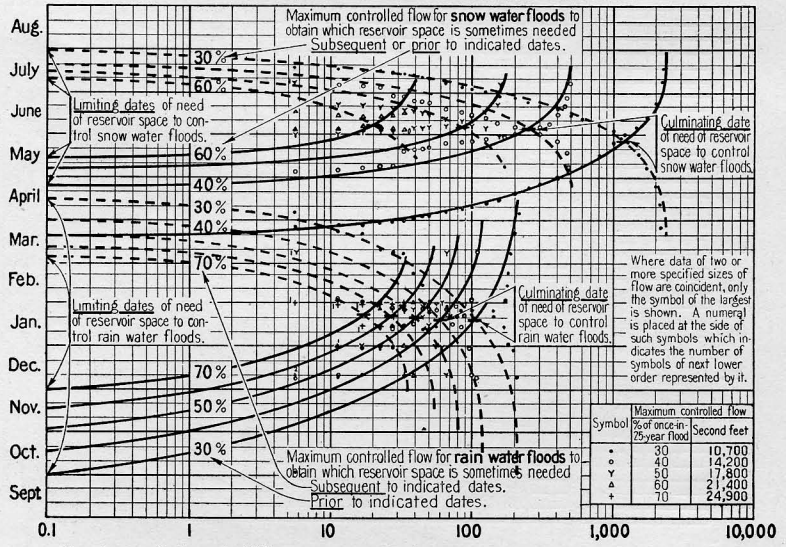
Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

PLATE XIV.

MOKELUMNE RIVER NEAR CLEMENTS



SAN JOAQUIN RIVER NEAR FRIANT



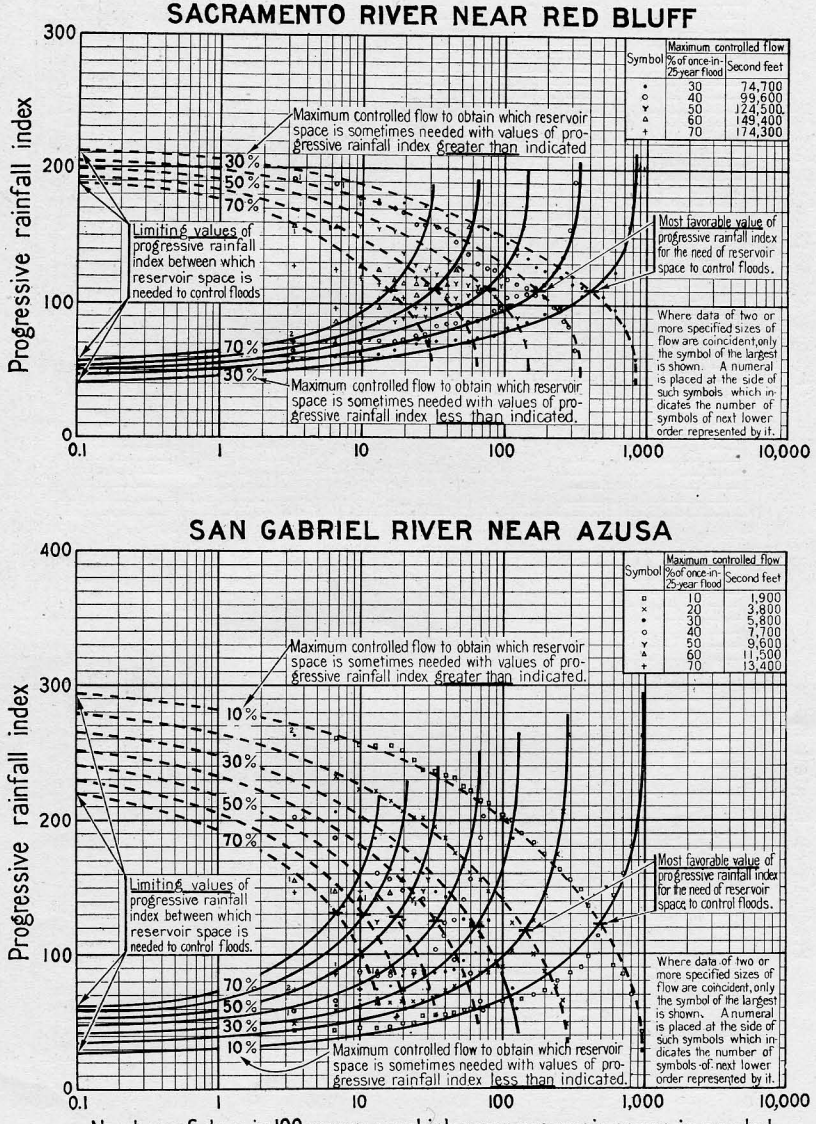
Number of days in 100 years on which some reservoir space is needed

RELATION OF TIME OF YEAR TO NEED OF RESERVOIR SPACE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH SOME RESERVOIR SPACE IS NEEDED PRIOR AND SUBSEQUENT TO INDICATED DATES TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

PLATE XV.

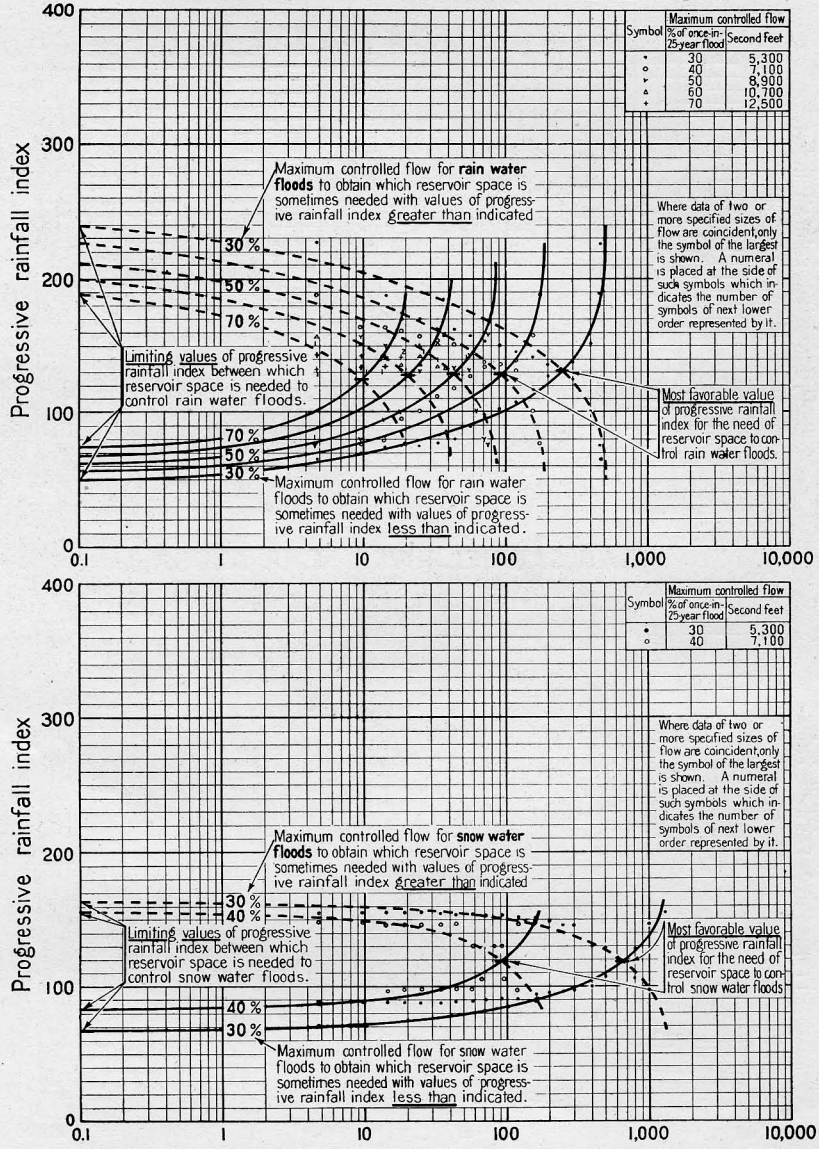


RELATION OF PROGRESSIVE RAINFALL INDEX TO NEED OF RESERVOIR SPACE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH SOME RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

PLATE XVI.

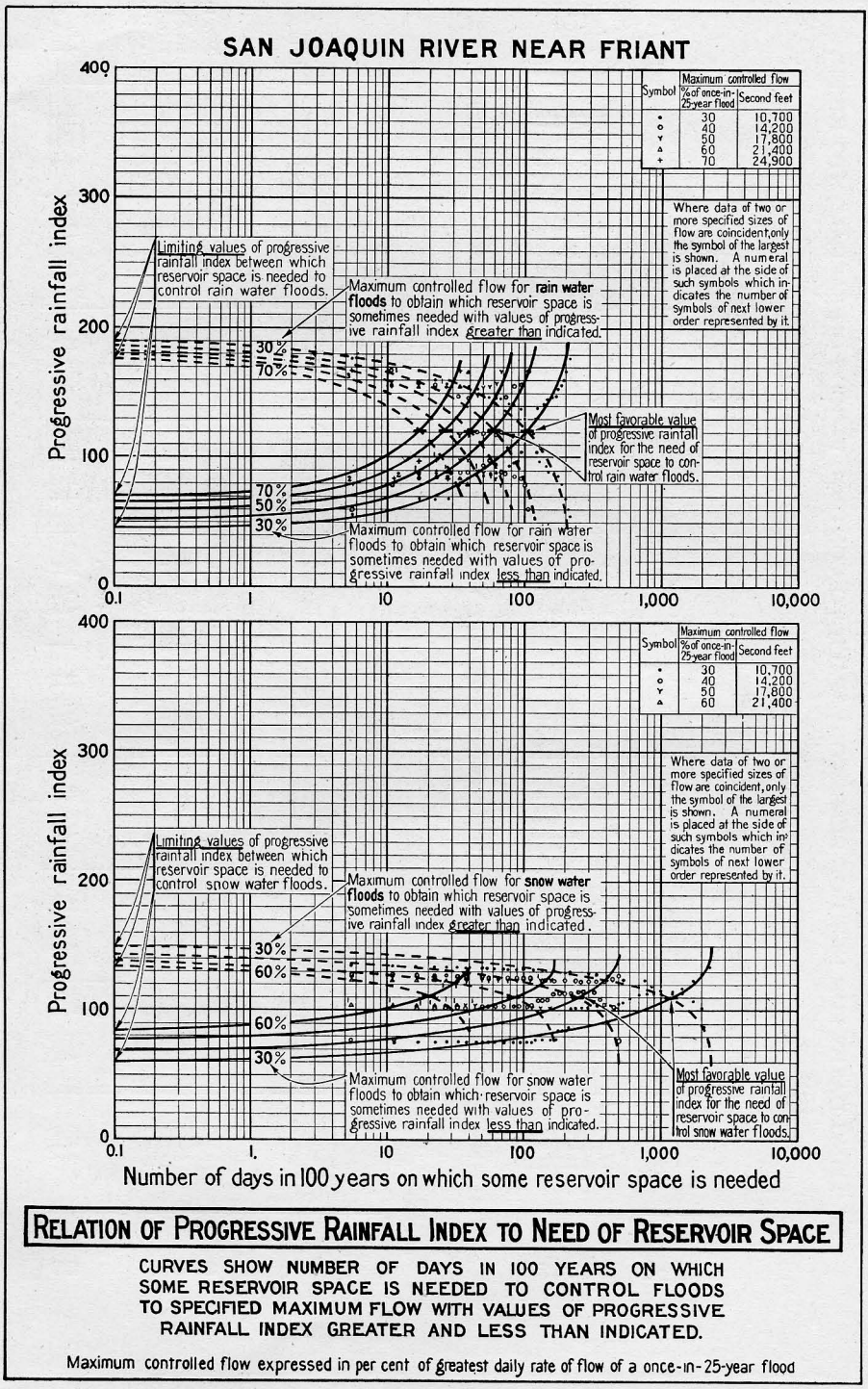


RELATION OF PROGRESSIVE RAINFALL INDEX TO NEED OF RESERVOIR SPACE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH SOME RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood.

PLATE XVII.



RELATION OF PROGRESSIVE RAINFALL INDEX TO NEED OF RESERVOIR SPACE

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH SOME RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW WITH VALUES OF PROGRESSIVE RAINFALL INDEX GREATER AND LESS THAN INDICATED.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

LIMITING DATES FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS ON SACRAMENTO RIVER.

Maximum controlled flow near Red Bluff		Opening dates					Closing dates				
		Frequency with which some reservoir space is needed **prior** to tabulated dates					Frequency with which some reservoir space is needed **subsequent** to tabulated dates				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
30	74,700	Oct. 14	Oct. 21	Oct. 25	Nov. 1	Nov. 11	May 13	May 7	May 3	Apr. 28	Apr. 19
40	99,600	Oct. 26	Nov. 3	Nov. 8	Nov. 15	Nov. 27	May 1	Apr. 23	Apr. 19	Apr. 14	Apr. 4
50	124,500	Nov. 6	Nov. 15	Nov. 21	Nov. 29	Dec. 14	Apr. 22	Apr. 13	Apr. 8	Apr. 2	Mar. 21
60	149,400	Nov. 15	Nov. 26	Dec. 3	Dec. 13	Dec. 31	Apr. 14	Apr. 5	Mar. 31	Mar. 23	Mar. 8
70	174,300	Nov. 23	Dec. 6	Dec. 15	Dec. 27	Jan. 20	Apr. 8	Mar. 30	Mar. 24	Mar. 14	Feb. 20

LIMITING DATES FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS ON MOKELUMNE RIVER.

Maximum controlled flow near Clements		Opening dates					Closing dates				
		Frequency with which some reservoir space is needed **prior** to tabulated dates					Frequency with which some reservoir space is needed **subsequent** to tabulated dates				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
				Rain-Water Floods.							
30	5,300	Nov. 6	Nov. 13	Nov. 17	Nov. 23	Dec. 3	Apr. 25	Apr. 22	Apr. 21	Apr. 19	Apr. 15
40	7,100	Nov. 19	Nov. 26	Dec. 1	Dec. 8	Dec. 20	Apr. 20	Apr. 17	Apr. 16	Apr. 13	Apr. 6
50	8,900	Nov. 30	Dec. 8	Dec. 14	Dec. 21	Jan. 4	Apr. 15	Apr. 12	Apr. 10	Apr. 6	Mar. 26
60	10,700	Dec. 9	Dec. 18	Dec. 25	Jan. 3	Jan. 21	Apr. 10	Apr. 5	Apr. 2	Mar. 27	Mar. 10
70	12,500	Dec. 17	Dec. 28	Jan. 5	Jan. 16	.....	Apr. 5	Mar. 29	Mar. 24	Mar. 13	.....
				Snow-Water Floods.							
30	5,300	Apr. 21	Apr. 22	Apr. 23	Apr. 24	Apr. 25	July 16	July 14	July 12	July 11	July 8
40	7,100	May 7	May 9	May 11	May 13	May 18	July 10	July 7	July 5	July 2	June 28

LIMITING DATES FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS ON SAN JOAQUIN RIVER.

Maximum controlled flow near Friant		Opening dates					Closing dates				
		Frequency with which some reservoir space is needed **prior** to tabulated dates					Frequency with which some reservoir space is needed **subsequent** to tabulated dates				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	10,700	Sept. 30	Oct. 16	Oct. 22	Oct. 31	Nov. 15	Apr. 15	Apr. 10	Apr. 7	Apr. 3	Mar. 25
40	14,200	Oct. 17	Oct. 31	Nov. 8	Nov. 17	Dec. 1	Mar. 31	Mar. 26	Mar. 23	Mar. 18	Mar. 9
50	17,800	Nov. 2	Nov. 15	Nov. 21	Nov. 30	Dec. 14	Mar. 20	Mar. 15	Mar. 12	Mar. 7	Feb. 24
60	21,400	Nov. 16	Nov. 28	Dec. 4	Dec. 12	Dec. 27	Mar. 12	Mar. 7	Mar. 4	Feb. 27	Feb. 15
70	24,900	Nov. 29	Dec. 10	Dec. 16	Dec. 24	Jan. 8	Mar. 5	Feb. 28	Feb. 24	Feb. 19	Feb. 5
					Snow-Water Floods.						
30	10,700	Mar. 19	Mar. 20	Mar. 22	Mar. 23	Mar. 26	July 30	July 26	July 25	July 22	July 19
40	14,200	Apr. 24	Apr. 25	Apr. 27	Apr. 28	May 1	July 21	July 17	July 16	July 13	July 10
50	17,800	May 7	May 8	May 9	May 11	May 15	July 14	July 10	July 9	July 6	July 2
60	21,400	May 14	May 16	May 17	May 20	May 26	July 9	July 5	July 3	June 29	June 19

LIMITING DATES FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS ON SAN GABRIEL RIVER.

Maximum controlled flow near Azusa		Opening dates					Closing dates				
		Frequency with which some reservoir space is needed **prior** to tabulated dates					Frequency with which some reservoir space is needed **subsequent** to tabulated dates				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
10	1,900	Oct. 27	Nov. 3	Nov. 6	Nov. 11	Nov. 19	Apr. 19	Apr. 17	Apr. 14	Apr. 12	Apr. 7
20	3,800	Nov. 7	Nov. 15	Nov. 19	Nov. 25	Dec. 5	Apr. 13	Apr. 9	Apr. 7	Apr. 3	Mar. 27
30	5,800	Nov. 16	Nov. 25	Dec. 1	Dec. 7	Dec. 20	Apr. 8	Apr. 3	Apr. 1	Mar. 27	Mar. 19
40	7,700	Nov. 24	Dec. 4	Dec. 11	Dec. 19	Jan. 4	Apr. 2	Mar. 29	Mar. 26	Mar. 20	Mar. 9
50	9,600	Nov. 30	Dec. 12	Dec. 19	Dec. 29	Jan. 18	Mar. 30	Mar. 24	Mar. 20	Mar. 13	Feb. 24
60	11,500	Dec. 5	Dec. 18	Dec. 27	Jan. 8	Feb. 1	Mar. 24	Mar. 18	Mar. 13	Mar. 5	Feb. 7
70	13,400	Dec. 9	Dec. 25	Jan. 4	Jan. 17	.....	Mar. 20	Mar. 13	Mar. 6	Feb. 23	.....

CULMINATING DATE FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS.

Maximum controlled flow	Date					
In per cent of greatest daily rate of flow of once-in-25-year flood	Sacramento River near Red Bluff	Mokelumne River near Clements		San Joaquin River near Friant		San Gabriel River near Azusa
		Rain-water floods	Snow-water floods	Rain-water floods	Snow-water floods	
10	.....	.....	.....	.....	.....	Feb. 7
20	.....	.....	.....	.....	.....	Feb. 7
30	Feb. 4	Feb. 22	May 28	Jan. 18	May 26	Feb. 7
40	Feb. 4	Feb. 18	June 7	Jan. 19	June 4	Feb. 7
50	Feb. 4	Feb. 15	.....	Jan. 20	June 5	Feb. 4
60	Feb. 4	Feb. 14	.....	Jan. 21	June 6	Feb. 4
70	Feb. 4	Feb. 12	.....	Jan. 22	.....	Feb. 4

SACRAMENTO RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX* BETWEEN WHICH RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS.

Maximum controlled flow near Red Bluff		Minimum index values					Maximum index values				
		Frequency with which some reservoir space is needed, with progressive rainfall index **less** than values tabulated					Frequency with which some reservoir space is needed, with progressive rainfall index **greater** than values tabulated				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
30	74,700	42	47	49	52	58	212	206	202	197	188
40	99,600	46	51	54	58	65	205	199	194	188	178
50	124,500	50	56	59	64	72	199	191	186	179	164
60	149,400	54	60	64	70	81	193	183	177	167	148
70	174,300	57	64	68	76	95	188	176	168	155	127

*At Red Bluff rainfall station.

MOKELUMNE RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX* BETWEEN WHICH RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS.

Maximum controlled flow near Clements		Minimum index values					Maximum index values				
		Frequency with which some reservoir space is needed, with progressive rainfall index less than values tabulated					Frequency with which some reservoir space is needed, with progressive rainfall index greater than values tabulated				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	5,300	50	55	58	62	70	240	228	222	215	204
40	7,100	56	61	64	69	78	226	213	207	199	186
50	8,900	62	67	71	77	88	212	198	191	183	169
60	10,700	68	74	78	86	103	200	185	177	168	150
70	12,500	74	81	86	97	.....	188	172	163	151	.....
					Snow-Water Floods.						
30	5,300	67	68	69	70	72	164	163	162	161	159
40	7,100	83	84	85	86	89	156	154	153	151	149

*At Electra rainfall station.

SAN JOAQUIN RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX* BETWEEN WHICH RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS.

Maximum controlled flow near Friant		Minimum index values					Maximum index values				
		Frequency with which some reservoir space is needed, with progressive rainfall index less than values tabulated					Frequency with which some reservoir space is needed, with progressive rainfall index greater than values tabulated				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
					Rain-Water Floods.						
30	10,700	45	47	49	52	59	190	185	183	179	173
40	14,200	53	55	57	60	70	186	181	179	175	167
50	17,800	60	62	65	68	79	182	177	174	170	160
60	21,400	66	69	71	76	89	179	173	170	164	151
70	24,900	71	74	77	83	101	176	169	164	157	140
					Snow-Water Floods.						
30	10,700	60	62	64	65	68	150	148	147	146	144
40	14,200	69	71	73	74	77	143	140	139	137	135
50	17,800	77	80	82	84	88	138	134	133	131	128
60	21,400	84	88	91	94	101	134	129	127	125	119

*At Fresno rainfall station.

SAN GABRIEL RIVER.

LIMITING VALUES OF PROGRESSIVE RAINFALL INDEX* BETWEEN WHICH RESERVOIR SPACE IS NEEDED TO CONTROL FLOODS.

Maximum controlled flow near Azusa		Minimum index values					Maximum index values				
		Frequency with which some reservoir space is needed, with progressive rainfall index **less** than values tabulated					Frequency with which some reservoir space is needed, with progressive rainfall index **greater** than values tabulated				
In per cent of greatest daily rate of flow of once-in-25-year flood	In second-feet	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years	One day in 1000 years	One day in 100 years	One day in 50 years	One day in 25 years	One day in 10 years
10	1,900	27	30	32	35	40	294	282	277	270	257
20	3,800	35	39	41	45	51	279	264	256	245	226
30	5,800	42	47	49	53	61	265	248	238	226	203
40	7,700	48	54	57	63	78	252	233	222	207	181
50	9,600	54	59	66	77	102	241	219	206	189	158
60	11,500	58	66	76	90	127	230	205	191	173	133
70	13,400	63	73	86	106	.....	220	193	178	156	.....

*At Claremont rainfall station.

MOST FAVORABLE VALUES OF PROGRESSIVE RAINFALL INDEX FOR NEED OF RESERVOIR SPACE TO CONTROL FLOODS.

Maximum controlled flow	Sacramento River near Red Bluff	Mokelumne River near Clements		San Joaquin River near Friant		San Gabriel River near Azusa
In per cent of greatest daily rate of flow of once-in-25-year flood		Rain-water floods	Snow-water floods	Rain-water floods	Snow-water floods	
10	.....	.....	.....	.....	.....	122
20	.....	.....	.....	.....	.....	117
30	110	130	120	122	110	121
40	110	129	120	122	110	125
50	110	128	.....	122	110	128
60	111	128	.....	122	110	130
70	110	125	.....	122	.....	131

CHAPTER V.

THE RESERVOIR OPERATING DIAGRAM FOR CONTROLLING FLOODS.

Principles of operating reservoirs for controlling floods.

The use of reservoirs for flood control in California, being of comparatively recent date, has not been standardized by the engineering profession. The practice varies. In general, reservoirs now in use for flood control have allotted either the entire or a specific part of their capacity for this purpose alone. The usual method of operation is to hold this entire space empty at all times except as it may be temporarily filled while detaining excessive flood flows and the water that accumulates while thus controlling floods is released as soon as the streams subside in order that this space may be empty for the control of the run-off of subsequent storms. Any water that is retained in storage is held upon the prediction of the reservoir operators that the space occupied by it will not be needed again that season for controlling floods.

The prediction that floods will not occur again in any season involves an estimate of future weather conditions, the most uncertain of all events. When water is stored in flood control reservoirs on such an estimate, an error results in failure in control of subsequent floods because the reservoir space needed to detain excessive rates of flow would already be filled with water held from the first storm. Failure in the control of floods means the loss of property and sometimes of human life. Were this danger not real, flood control reservoirs would not be built. For matters of such importance, it would seem unsafe to rely upon the judgment of operators in the most uncertain of predictions, especially since the decisions of gravest moment must be made during the stress of large floods. The risk of an error in judgment under these circumstances is too great for attaining surety in protection. For this reason the use of flood control reservoirs for conservation purposes generally has not been looked upon with favor.

For a like reason, many engineers propose the exclusion of manually operated gates on the outlets of flood control reservoirs. Contention is made that the risk is great in relying upon human activity of any kind during critical periods; rather, they would have the reservoir discharge its water and empty automatically through ports in the dams with fixed openings. This view, however, would seem to be somewhat extreme, for it is now common practice to place manually operated gates in the spillways of reservoirs. These are closed toward the end of the run-off season in order to utilize the top layers of the reservoir for storing water. They are opened again after the summer's draft has lowered the reservoir level, but before the next season's rains. Should the attendants fail to open these gates, the capacity of the spillway would be destroyed and a fair-sized flood would overtop the dam. In spite of this danger, reliance is placed on the manual operation of these gates to clear the spillway prior to the occurrence of a flood.

The manual operation of control mechanism is customary in many other lines of endeavor where the safety of life and property is involved, especially in our transportation system. Custom relies upon hand-controlled signals, valves and steering apparatus for the safety of life and property in all modes of transportation. Dispatchers, tower men, engineers of railroads, auto-bus drivers, and captains of ocean-going vessels, in the faithful and exact performance of their duty, hold within their hands the safety of millions of passengers and vast wealth. These men are required to operate apparatus under guiding rules. Judgment, other than that necessary for applying the guiding rules, is not needed. Because of the many successful years of the operation of our transportation systems on both land and water, it would seem that the manual operation of apparatus under guiding rules is quite safe. By analogy, therefore, it would not seem necessary for safety to exclude the use of manually operated gates on the outlets of flood control reservoirs, provided that guiding rules, definite and enforcible, be laid down for their opening and closing.

Without gates controlled by hand on the outlets of flood control reservoirs, a coordinated use of their space for both flood control and conservation is impossible. Gates that may be closed when desired are necessary in order that flood control reservoirs may store water for any length of time. Therefore, the safe use of the same reservoir space for both flood control and conservation is contingent upon working out definite guiding rules for opening and closing the outlet gates that do not employ judgment in their execution and that can be enforced.

Rules for opening and closing reservoir outlet gates that will control floods with certainty may be worked out easily enough if no attempt is made to avoid interference with the conservation values of the reservoirs. To produce rules, however, that will hold sufficient reservoir space empty during the flood season to assure the successful control of floods while at the same time releasing this space as the season progresses so that it may fill with water before the end of the run-off season, is a complex undertaking. It has been the purpose of these investigations to develop the principles upon which such rules might be scientifically constructed and, by way of illustration, to construct several rules, test their accuracy and determine their effect on conservation. These principles have been developed in the foregoing chapters. The construction of the rules, the test of their accuracy and the determination of their effect on conservation occupy this and the concluding chapters.

The reservoir operating diagram.

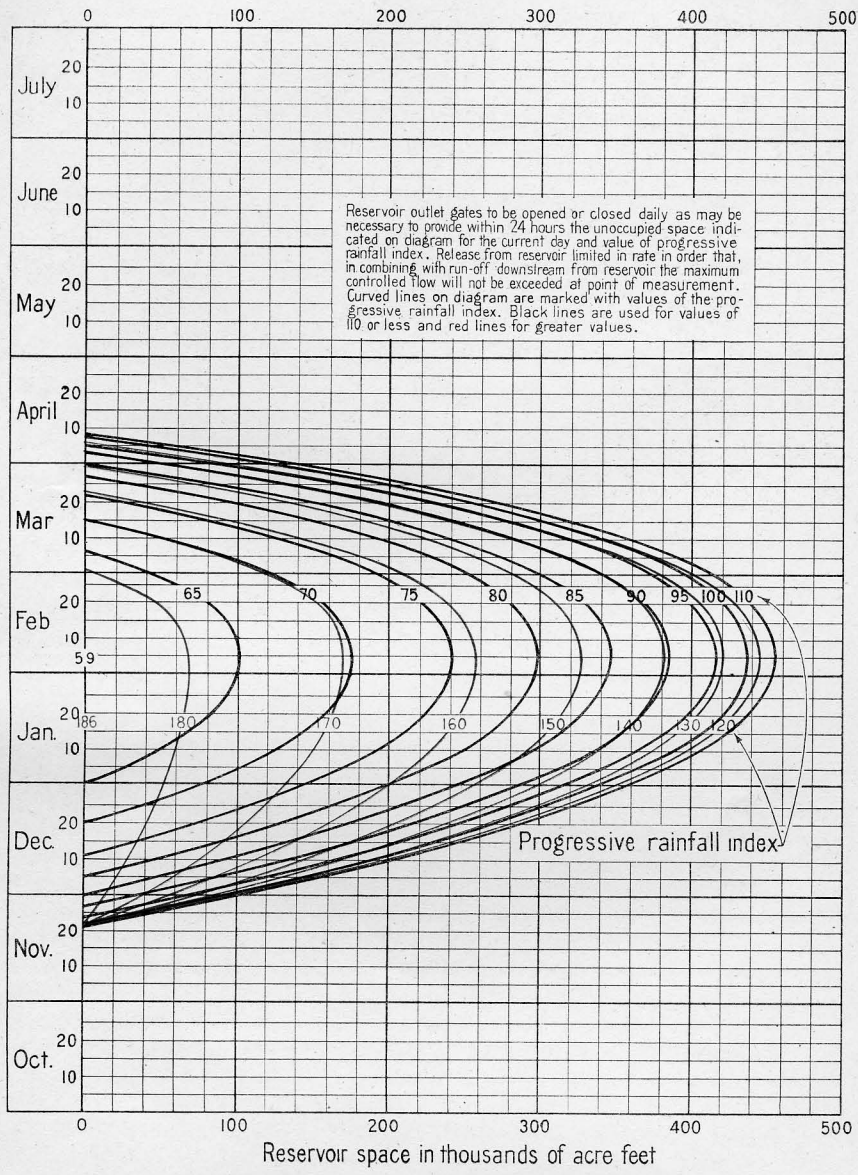
It has been pointed out in the preceding chapters, that the same amount of reservoir space is not needed for controlling floods at all times during a season nor in all seasons. The amount of space needed under the many circumstances of time of year and type of season is determined by the analysis of the need of reservoir space for controlling floods described in the previous pages. In general, the amount of space needed for detaining excessive flood flows so that only limited amounts pass the reservoir increases from zero in the early fall to a maximum in midwinter and then, as the season progresses, decreases to zero in the forepart of summer. It also fluctuates with the normalcy of the

season's precipitation. In general, summarizing the deductions of the first four chapters, when the seasonal precipitation to date is less than half or more than double normal, large floods do not occur. Under these conditions, reservoir space is not needed for flood control regardless of the time of year. It is needed in the largest volume when the precipitation to date is between normal and 50 per cent above. The largest floods occur under these circumstances and the maximum reservoir space is then required for controlling floods. Space in amounts intermediate between zero and the maximum is necessary when the seasonal precipitation to date is between 50 and 100 or between 150 and 200 per cent normal. The exact value of these requirements varies with each stream and the degree of control desired.

The amount of reservoir space required under the many variant circumstances of time of year, type of season, and degree of desired control may be specifically derived through analyses similar to the ones in the preceding chapters. Having determined these amounts, rules may be laid down that will release the space required for flood control as soon as its need for that purpose has passed. This space may then fill for conservation. The dependability of such rules for controlling floods rests upon the selection of adequate amounts of space to be held empty during the flood season. Their value to conservation rests upon the immediate release of this space for filling as soon as its need for flood control has passed. Thus, the determination of the amount of space that should be held empty during the flood season and of the time that all or part of it may be released safely for filling is the foundation for formulating rules for the combined use of the same reservoir space for both flood control and conservation.

The rules, as devised by this investigation, are expressed in the form of graphic diagrams which show the amount of reservoir space that, for the circumstance existing on any current day, should be empty in order to assure the degree of flood control desired. The reservoir outlet gates would be opened or closed daily as may be necessary to provide within 24 hours the required empty space indicated on the diagram. The gates would be opened when this space is less than indicated and the discharge through the outlets is less than the desired maximum controlled flow. The gates would be closed whenever the empty space in the reservoir is greater than indicated on the diagram. All inflow to the reservoir would then enter storage except as water may be withdrawn for some useful purpose.

These graphic rules are called "Reservoir Operating Diagrams for Controlling Floods." Each diagram applies to a particular stream and to a particular degree of control. The degree of control is expressed by the maximum controlled flow desired at some point of measurement and the probability that this will not be exceeded. This probability is measured in the analyses herein described by the number of days in an average hundred years on which greater flows may occur. The greater the assurance of perfect control, the larger is the amount of reservoir space required and the longer is the period during which it should be held empty. Practical values in accord with the danger to life and property must be selected for design purposes in each instance. For sparsely settled rural lands, it is thought that adequate protection would be had if the desired maximum controlled flow were exceeded on



RESERVOIR OPERATING DIAGRAM FOR CONTROLLING FLOODS ON SACRAMENTO RIVER

MAXIMUM CONTROLLED FLOW NEAR RED BLUFF-125,000 SEC. FT.

CURVES SHOW SPACE NEEDED AT VARYING TIMES OF YEAR AND VALUES OF PROGRESSIVE RAINFALL INDEX TO ABSORB EXCESSIVE FLOOD FLOWS.

an average not oftener than one day in 25 years, while for very thickly populated territory, it probably should not be exceeded oftener than one day in a thousand years or more.

After selecting the degree of control desired, a reservoir operating diagram for controlling floods may be constructed for any stream from the analyses of its flow measurements. This diagram would apply only to reservoirs having drainage areas between them and the point of measurement that do not produce floods greater than the selected maximum controlled flow. In releasing water from reservoirs located upstream from the point of measurement, the amount would be governed by the flow at the point of measurement. The release from the reservoir would be limited to an amount that, combined with the natural run-off from the drainage area downstream, would not exceed the desired controlled flow at the point of measurement.

The analyses of stream flow data required for the construction of a reservoir operating diagram are identical to those described in Chapter IV. The analyses there described of the stream flow data on the Sacramento, Mokelumne, San Joaquin and San Gabriel rivers furnish information for the construction of reservoir operating diagrams for any desired degree of flood control on these four streams. The construction, from this information, of a diagram for one selected degree of control on each of the four streams is described in the following pages of this chapter.

For convenience in working with these diagrams, the use of the name "progressive rainfall index" that represents the normalcy of seasonal precipitation in the analyses of Chapters III and IV has been continued. It is the ratio of the precipitation from July 1st up to any current day in a season to the normal precipitation for the same period. Its value changes daily as the season progresses.

In using the diagrams, it is necessary to maintain a rain gage in order to obtain the current value of the progressive rainfall index. This gage should be read and the value of the progressive rainfall index computed on each day. The diagram should be entered with this value and the amount of space read-off that should be empty at the end of the current day. The outlet gates should then be regulated to obtain this empty space so far as may be done without causing a flow at the point of measurement greater than the desired maximum. If the reservoir outlet gates were so regulated daily, by reason of the method of constructing the diagram, the reservoir would not be expected to fill to overflowing except at the average intervals contemplated in the selection of the degree of probable control. At these average intervals, the reservoir would be expected to overflow while the maximum controlled flow is passing the point of measurement. Thus, the maximum controlled flow below the reservoir may be exceeded by the amount of this overflow at the average intervals selected in the construction of the diagram. The amount of the overflow might be anything larger than zero with the greatest likelihood of its being among the smaller values.

Reservoir operating diagram for controlling floods on Sacramento River.

Plate XVIII, "Reservoir Operating Diagram for Controlling Floods on Sacramento River," presents in graphic form the rule for operating

a reservoir on the main Sacramento River in order to limit the flow in the channel near Red Bluff to 125,000 second-feet. It indicates the space in the reservoir that should be empty in order to detain run-off in excess of this desired regulated flow for all conditions of previous rainfall on every day of the season. The amount of space that should be empty changes with the time of year and the normalcy of the season's precipitation as shown by the value of the progressive rainfall index. A maximum of 454,000 acre-feet is required to be empty in the fore part of February if the precipitation up to that time is 10 per cent above normal. On preceding and subsequent days the space required becomes less until prior to November 21st and subsequent to April 8th, no space is needed at all. The required space also becomes less for seasonal precipitation to date either larger or smaller than 10 per cent above normal and reaches zero for precipitation greater than 186 per cent or less than 59 per cent normal.

Had there been a reservoir in existence and operated in accord with this diagram through the thirty years of stream flow record on the Sacramento River, the flow at Red Bluff would not have exceeded 125,000 second-feet at any time. Even the greatest flood of record on February 3, 1909, which reached a crest discharge of 278,000 second-feet, would have been limited to a flow of 125,000 second feet, 153,000 second-feet less than the actual occurrence. Although controlling floods to this discharge, the diagram holds space in the reservoir empty no longer than necessary. Thus, the rule of reservoir operation laid down by this diagram interferes as little as possible with the use of the reservoir for conservation.

The diagram applies to any reservoir of more than 454,000* acre-feet capacity that might be constructed on the main Sacramento River between the Red Bluff gaging station and the Kennett reservoir site near the confluence with the Pit River. It does not apply to reservoirs further upstream than Kennett because it is estimated that a flood as large as 125,000 second-feet may originate on the drainage area downstream from Kennett but tributary to the Red Bluff gaging station.

The values of the progressive rainfall index used in the construction of the diagram were computed from the rainfall records of the United States Weather Bureau at Red Bluff.† These values are marked on the curved lines of the diagram. Black lines are used for values of 110 or less and red lines for greater values. The intersections of the curved lines with the horizontal date lines indicate on the lower scale the amount of empty space needed at any time. The diagram assumes that the reservoir outlet gates will be opened or closed daily as may be necessary to provide as nearly as possible within 24 hours without causing the desired regulated flow to be exceeded, the empty space indicated on the diagram for the current day and value of progressive rainfall index. If the reservoir were located upstream from Red Bluff, the release through the outlet gates would be limited to amounts that would not exceed 125,000 second-feet after combining with the run-off from the drainage area between the reservoir and Red Bluff.

* The reservoir space needed for flood control in addition to 454,000 acre-feet is that which would furnish the minimum operating head on the reservoir outlets to discharge 125,000 second-feet.

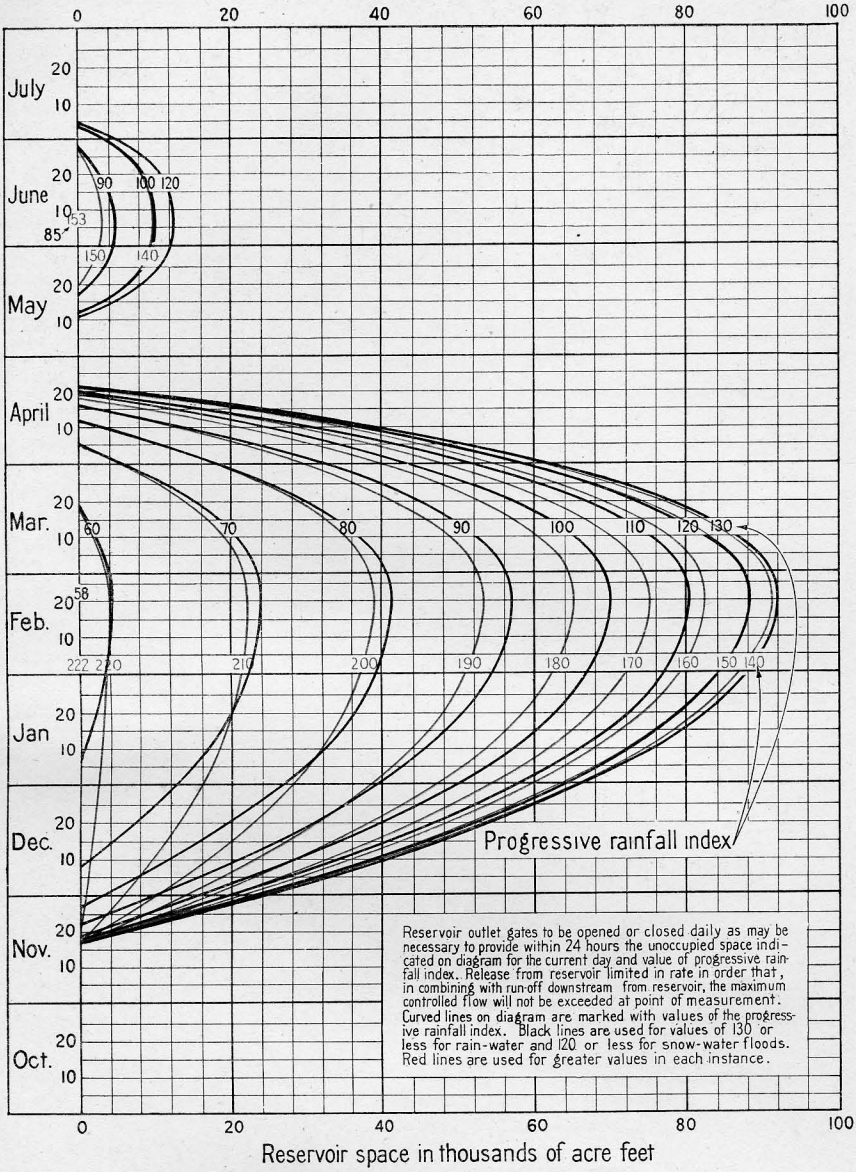
† Red Bluff is one of the principal stations in precipitation division B of which most of the flood producing area of the Sacramento Drainage Basin is part. See Chap. II, Bul. 5, "Flow in California Streams," issued by the Division of Engineering and Irrigation, State Department of Public Works.

The degree of control selected for construction of the Sacramento River diagram contemplates that the desired regulated flow may be exceeded on an average of one day in fifty years. This was used in taking values off the charts of Chapter IV for constructing the diagram. The maximum reservoir space required under the most severe circumstances is taken from Plate X, p. 55. In the upper figure on this plate, reading the 50 per cent curve (124,500 second-feet), it is found that reservoir space in the amount of 92 per cent of the greatest daily run-off of a once-in-25-year flood (454,000 acre-feet) is sufficient, on the average, to control floods to 125,000 second-feet maximum flow at Red Bluff on all but one day in fifty years. The time at which this maximum space is required is taken from the upper figure of Plate XIII, p. 63. The intersection of the full and dotted-line curves labeled 50 per cent (124,500 second-feet) determines that the culminating date of need of reservoir space to control floods is February 4th. This date and the maximum reservoir space needed locate on the diagram the apex of the outside curve, the one of largest values of reservoir space.

The two arms of the outside curve are fixed in position by their intersections with the vertical line on the left representing zero reservoir space. Their intersections with this vertical read on the time scale are at the days before and after which reservoir space is not needed to control floods. These dates are determined on the upper figure of Plate XIII, p. 63, by the intersection of the 50 per cent curves (124,500 second-feet) with the vertical representing two days in 100 years on which some reservoir space is required to control floods. The full-line curve intersects at November 21st, the date before which reservoir space is not needed. The dotted-line curve intersects at April 8th, the day after which reservoir space is not needed. These two dates, plotted on the operating diagram on the line of zero reservoir space, fix the position of the arms of the outside curve. With the apex and the position of the two arms fixed, the shape of the curve was estimated from a study of the data on twenty major streams in California and by the trial construction of diagrams. The shape given is the one that seems to fit the data best.

This curve, outermost of all others on the diagram, expresses the largest values of reservoir space that are required at any time. The amount of space indicated by it should be held empty when the conditions of previous rainfall are most favorable for the need of reservoir space to control floods. The value of the progressive rainfall index most favorable for the need of reservoir space is taken from the upper figure of Plate XV, p. 65. Here the dotted and full-line curves representing control to 50 per cent of a once-in-25-year flood (124,500 second-feet) intersect at a value of 110 read on the scale of progressive rainfall index. This is the most favorable value for need of reservoir space to control floods and hence is the value of the progressive rainfall index that applies to the outside curve of the operating diagram.

The interior curves that indicate the empty space required with values of the progressive rainfall index either greater or less than the one calling for the largest amount of empty reservoir space are drawn of a shape similar to the outside curve. There is one black curve for each increment of five in the values of the progressive rainfall index less than 110, and one red curve for each increment of ten in



RESERVOIR OPERATING DIAGRAM FOR CONTROLLING FLOODS ON MOKELUMNE RIVER

MAXIMUM CONTROLLED FLOW NEAR CLEMENTS
FOR
RAIN WATER FLOODS – 5,300 SEC. FT.
SNOW WATER FLOODS – 7,100 SEC. FT.

CURVES SHOW SPACE NEEDED AT VARYING TIMES OF YEAR AND VALUES OF PROGRESSIVE RAINFALL INDEX TO ABSORB EXCESSIVE FLOOD FLOWS.

the values of the progressive rainfall index greater than 110. The curve of smallest index value is 65 and largest 180. Both are close to the zero ordinate of reservoir space on the diagram. The index values coinciding with the zero ordinate of reservoir space are 59 and 186. These are the limiting values between which reservoir space is required to control floods. No space is needed when the index is either smaller or larger, respectively. These values are derived from Plate XV, p. 65. In the upper figure on this plate, the two 50 per cent curves (124,500 second-feet) intersect the vertical representing two days in 100 years that values will be exceeded, at 59 and 186 on the vertical scale of progressive rainfall index. The intersection of the full-line curve shows that, for values of the progressive rainfall index less than 59, reservoir space is not required oftener than two days in 100 years. Similarly, the intersection of the dotted-line curve shows that reservoir space is not required to control floods except for two days in 100 years when the progressive rainfall index exceeds 186.

The positions of the apices of the several interior curves on the diagram are interpolated between the outside curve of maximum reservoir space and zero on the reservoir space scale along the line representing February 4th, the culminating date for need of reservoir space in controlling floods. They are not arranged with uniform intervals between them, but rather take positions having increasingly smaller intervals as the maximum reservoir space is approached. The arms of the interior curves are drawn of the same general shape as the outside curve and are interpolated in position with increasingly smaller intervals between them toward the latter part of the flood season. While normally the arms toward the fore part of the flood season would take similar positions, since at this time of the year the index values fluctuate rapidly and are not well established, they are all passed through November 21st on the zero reservoir space line, the opening date of the flood season. This manner of fixing the positions of the apices and arms of the interior curves was found to fit the data best after construction of many trial and supplementary diagrams on this and other streams and for other degrees of flood control.

Reservoir operating diagram for controlling floods on Mokelumne River.

The rule for operating a reservoir to control floods on the Mokelumne River is expressed on Plate XIX, "Reservoir Operating Diagram for Controlling Floods on Mokelumne River." As on the one for the Sacramento River, the Mokelumne River diagram indicates the space in a reservoir that should be empty on each day of the season for all conditions of previous precipitation in order to detain discharges in excess of a certain desired controlled flow. The Mokelumne River diagram would limit the flow near Clements, the point of measurement on the Mokelumne River, to a maximum of 5300 second-feet for rain-water floods and 7100 second-feet for snow-water floods. The diagram applies to any reservoir within a distance of about 30 miles upstream from Clements. The reservoir would need to have a capacity greater than 92,000* acre-feet, the maximum space required. The Mokelumne diagram, like that for the Sacramento, assumes that the reservoir outlet

* The reservoir space needed for flood control in addition to 92,000 acre-feet is that which would furnish the minimum operating head on the reservoir outlets to discharge 5300 second-feet.

gates will be opened or closed daily as may be necessary to provide as nearly as possible within 24 hours without causing a flow at Clements greater than desired, the empty space indicated on the diagram for the current day and value of progressive rainfall index.

The chief distinction between this diagram and the one for the Sacramento River is that it provides for controlling snow-water floods in the early summer. These do not occur on the Sacramento but are a part of the normal regime of the Mokelumne River. The Mokelumne diagram provides for limiting their maximum rate of discharge to 7100 second-feet, 1800 second-feet more than the maximum controlled flow for rain-water floods. It is estimated that these two controlled flows would be about equivalent one to the other in the lower channel of the river because the snow-water flow will be reduced by summer diversions for irrigation while the natural run-off downstream from the point of measurement will contribute some to the regulated rain-water floods.

The greatest rain-water flood contained in the twenty-one years of stream-flow record at Clements occurred on January 30, 1911. The crest discharge was 20,600* second-feet, 15,300 second-feet larger than the controlled flow to which rain-water floods would be limited by reservoir operation in accordance with the diagram. The mean daily flow on January 30, 1911, was 16,700 second-feet. The largest snow-water flood appears in the record on June 12, 1906, with a discharge of 8740 second-feet. This is only 1640 second-feet larger than the controlled snow-water flow that would result from use of the diagram. Since snow-water floods do not attain as great a rate of flow as those from rain water, large reductions are not necessary in order to confine them to a channel of reasonable size. For this reason the reservoir space required for the control of snow-water floods on the Mokelumne River is much less than for the control of rain-water floods. The greatest space required in order to limit snow-water floods to 7100 second-feet is 13,000 acre-feet. A maximum of 92,000 acre-feet is required to limit rain-water floods to 5300 second-feet.

On the Mokelumne diagram during the period of rain-water floods, the greatest space is held empty when the progressive rainfall index has a value of 130 and during the period of snow-water floods, when it has a value of 120. The curves in black indicate the space to be held empty for index values less than 130 and 120, respectively, while the curves in red indicate the space to be held empty for greater index values. The extreme values between which any reservoir space is needed at all are 58 and 222 for rain-water floods and 85 and 153 for snow-water floods. These differ somewhat from the corresponding values on the Sacramento River diagram. Similarly, the limiting dates of the flood season are slightly different. Unlike the Sacramento diagram, however, that for the Mokelumne holds a small amount of space

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second-feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second-feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make them harmonize.

empty between May 11th and July 5th for the control of snow-water floods that do not occur on the Sacramento River.

The diagram for controlling floods on the Mokelumne River is constructed in a way identical to that previously described for the one on the Sacramento River; the same probability of average exceptional behavior of one day in 50 years was selected, and the values are taken in exactly the same way from the analyses of Chapter IV which were carried out in parallel for the four illustrative streams. The values of the progressive rainfall index used in the Mokelumne River analyses were computed from the records of the United States Weather Bureau station at Electra.* This is the station at which the rainfall index should be determined in applying the diagram.

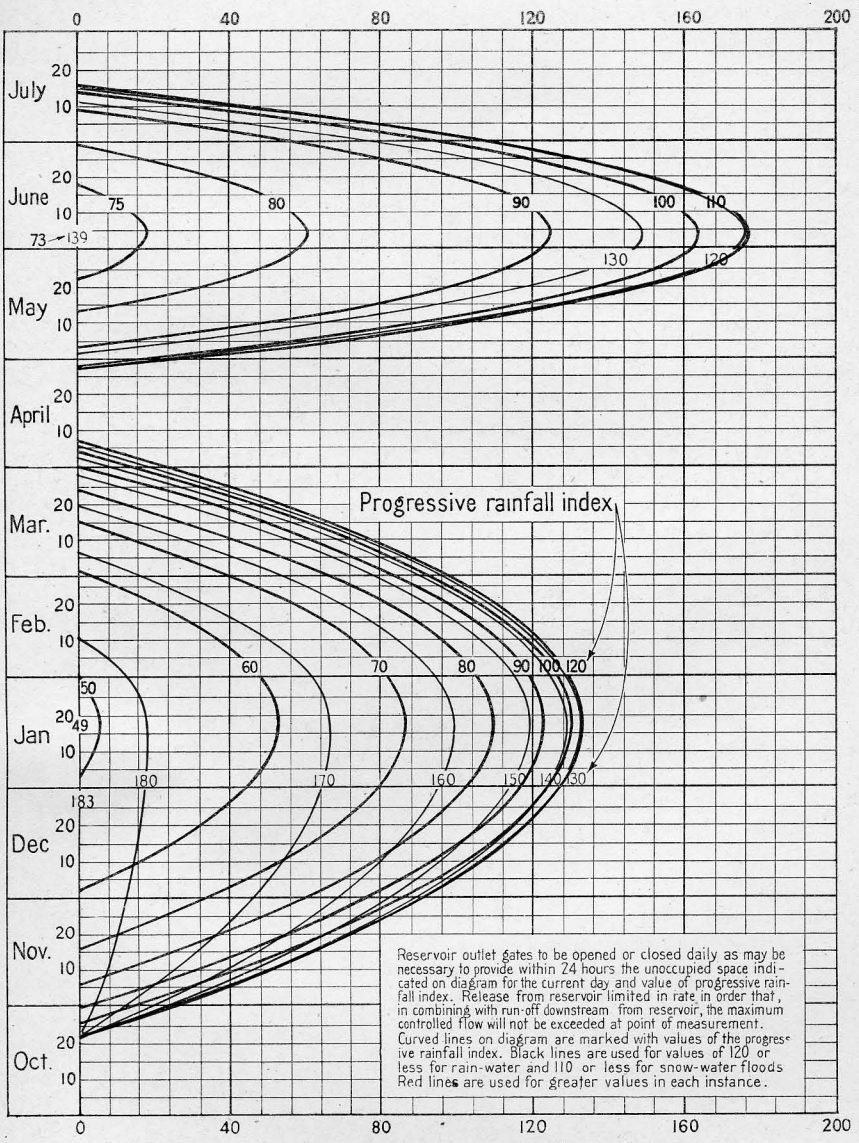
The maximum reservoir space required on the Mokelumne diagram under the most severe circumstances is taken from Plate XI, p. 56. Reading the 30 per cent (5300 second-feet) curve for rain-water floods and the 40 per cent (7100 second-feet) curve for snow-water floods, the reservoir space required for flood control except probably on an average of two days in 100 years is 260 per cent of the greatest daily run-off of a once-in-25-year flood (92,000 acre-feet) for the control of rain-water floods and 36 per cent (13,000 acre-feet) for the control of snow-water floods.

The culminating date of the two flood seasons, at which time the maximum empty space is needed, is determined from the upper figure of Plate XIV, p. 64. Here, on the part pertaining to rain-water floods, the intersection of the dotted and full-line curves labeled 30 per cent (5300 second-feet) shows the culminating date of the season to be February 22d; on the part pertaining to snow-water floods, the intersection of the dotted and full-line curves labeled 40 per cent (7100 second-feet) shows the culminating date of the snow-water flood season to be June 7th. These two dates on which maximum empty space is needed fix the position on the time scale of the apices of the two sets of curves of the reservoir operating diagram.

The positions of the arms of the outside curves are fixed by the limiting dates of the flood season. These dates are taken from the upper figure of Plate XIV, p. 64. On the part of this figure pertaining to rain-water floods, the intersections of the two 30 per cent (5300 second-feet) curves with the vertical representing two days in 100 years on which some reservoir space is needed to control floods, give November 17th and April 21st as the limiting dates of the flood season. Similarly, on the part pertaining to snow-water floods, the two 40 per cent (7100 second-feet) curves intersecting on the same vertical indicate the limiting dates for this season to be May 11th and July 5th. The arms of the outside curves on the reservoir operating diagram pass through these dates on the line of zero reservoir space. The shape of the curves was determined by the preparation of supplementary and trial diagrams in the same way as for the Sacramento River diagram.

The value of progressive rainfall index with which this maximum reservoir space is needed is taken from Plate XVI, p. 66. Here the intersections of the full and dotted-line curves labeled 30 per cent

* Electra is a cooperative station of the United States Weather Bureau and one of the principal stations in precipitation division K of which the Mokelumne drainage basin is part. See Chapter II, Bul. 5, "Flow in California Streams," issued by the Division of Engineering and Irrigation, State Department of Public Works.



RESERVOIR OPERATING DIAGRAM FOR CONTROLLING FLOODS ON SAN JOAQUIN RIVER

MAXIMUM CONTROLLED FLOW NEAR FRIANT
FOR
RAIN WATER FLOODS – 10,700 SEC. FT.
SNOW WATER FLOODS – 14,200 SEC. FT.

CURVES SHOW SPACE NEEDED AT VARYING TIMES OF YEAR AND VALUES OF PROGRESSIVE RAINFALL INDEX TO ABSORB EXCESSIVE FLOOD FLOWS

(5300 second-feet) for rain-water floods and 40 per cent (7100 second-feet) for snow-water floods indicate values of 130 and 120, respectively. These are the index values of the outside curves on the operating diagram whose apices indicate respectively on the reservoir space scale the maximum empty space of 92,000 acre-feet for rain-water floods and 13,000 acre-feet for snow-water floods.

The interior curves are drafted in comparison with the exterior curves after interpolating the positions of their apices between that of the outside curve and the line of zero reservoir space and the positions of the arms of the curves between the limiting and central dates of the flood season as in the preparation of the Sacramento River diagram. There is one black curve for each increment of 10 in the progressive rainfall index values less than that most favorable for the need of reservoir space to control floods and one red curve for each similar increment greater than the most favorable value. The values of the progressive rainfall index that apply to the curves of smallest and largest values which are coincident with the line of zero reservoir space on the operating diagram, and above and below which reservoir space is not needed to control floods, are obtained from Plate XVI, p. 66. On the part pertaining to rain-water floods, the intersections of the dotted and full-line curves labeled 30 per cent (5300 second-feet) with the vertical representing two days in 100 years on which values will be exceeded, yield limiting values of the progressive rainfall index of 58 and 222; while on the part pertaining to snow-water floods, the intersections of the dotted and full-line curves labeled 40 per cent (7100 second-feet) yield limiting values of 85 and 153.

Reservoir operating diagram for controlling floods on San Joaquin River.

The rule for operating a reservoir on the San Joaquin River for flood control is delineated on Plate XX, "Reservoir Operating Diagram for Controlling Floods on San Joaquin River." This diagram is quite the same as the one for the Mokelumne River except that snow-water floods become relatively more important and require more reservoir space for their control than rain-water floods. The maximum space required to control rain-water floods is 133,000 acre-feet while 177,000 acre-feet are required for the control of snow-water floods. This maximum space for rain-water floods is needed on January 18th and for snow-water floods on June 4th when the values of the progressive rainfall index are 122 and 110, respectively. The space required on these and other dates when the index values are less than 122 for rain-water and 110 for snow-water floods, is indicated by the several black curves labeled with smaller index values. The red curves indicate the space required when the index values exceed 122 and 110, respectively.

The diagram applies to any reservoir within a distance of about 30 miles upstream from Friant, the point of measurement on the San Joaquin River. With a capacity greater than 177,000* acre-feet the application of the rule would result in limiting rain-water floods to a maximum flow of 10,700 second-feet and snow-water floods to a maximum flow of 14,200 second-feet at the point of measurement. It is estimated, because of diversions for irrigation from the snow-water

* The reservoir space needed for flood control in addition to 177,000 acre-feet is that which would furnish the minimum operating head on the reservoir outlets to discharge 14,200 second-feet.

flows and accretions to the rain-water run-off downstream from the point of measurement, that these two regulations will produce approximately an equivalent effect in the lower channel of the river.

With the exception of a small fall flood occurring on October 2, 1918, with a mean daily discharge of 10,900 second-feet, the diagram will control all floods shown in the eighteen years of continuous record by the United States Geological Survey. The flood of January 31, 1911, with a mean daily flow of 38,800 second-feet was the largest during this period. It was 28,100 second-feet greater than the maximum controlled rain-water flow that would be obtained by application of the diagram. The largest snow-water flood during the period occurred on June 13, 1911, when the mean daily flow was 23,100 second-feet. This is 8900 second-feet larger than the maximum controlled snow-water flow that would be obtained by application of the diagram.

The San Joaquin River diagram was constructed from data taken from the analytical graphs of Chapter IV in a way identical to that for the construction of the diagrams for the Sacramento and Mokelumne rivers. The same probability that the desired maximum controlled flow may be exceeded on an average of one day in 50 years was used. The values of the progressive rainfall index for the San Joaquin River were computed from the records of the United States Weather Bureau at Fresno.* This station should be used for determining the index values in applying the diagram.

The positions of the apices of the outside curves along the scale of reservoir space are taken from Plate XII, p. 57. Reading the 30 per cent curve (10,700 second-feet) for rain-water floods and the 40 per cent curve (14,200 second-feet) for snow-water floods, it is seen that, for full control except probably on an average of two days in 100 years, the maximum space required is 188 per cent of the greatest daily run-off of a once-in-25-year flood (133,000 acre-feet) for the control of rain-water floods, and 250 per cent (177,000 acre-feet) for the control of snow-water floods.

The dates on which this maximum space is required, the culminating dates of the two flood seasons, are taken from the lower figure of Plate XIV, p. 64. On the part of the figure pertaining to rain-water floods, the intersection of the dotted and full-line curves labeled 30 per cent (10,700 second-feet) shows this to be January 18th. On the part pertaining to snow-water floods, the intersection of the dotted and full-line curves labeled 40 per cent (14,200 second-feet) shows this date to be June 4th.

The arms of the outside curves of the diagram have their positions defined by the limiting dates of the flood season taken from the lower figure on Plate XIV, p. 64. Here, on the part pertaining to rain-water floods, the intersections of the two 30 per cent (10,700 second-feet) curves, one dotted and one full-line, with the vertical representing two days in 100 years on which some reservoir space is needed to control floods, give October 22d and April 7th. Similarly, on the part of the figure pertaining to snow-water floods, the two 40 per cent curves (14,200 second-feet) intersect the same vertical at April 27th and July 16th. These are the limiting dates of the two flood seasons before

* Fresno is one of the principal stations in precipitation division Q of which the San Joaquin drainage basin is part. See Chap. II, Bul. 5, "Flow in California Streams," issued by the Division of Engineering and Irrigation, State Department of Public Works.

and after which reservoir space is not needed to control floods. The positions of the arms of the interior curves and their shapes were determined as for the Sacramento and Mokelumne river diagrams.

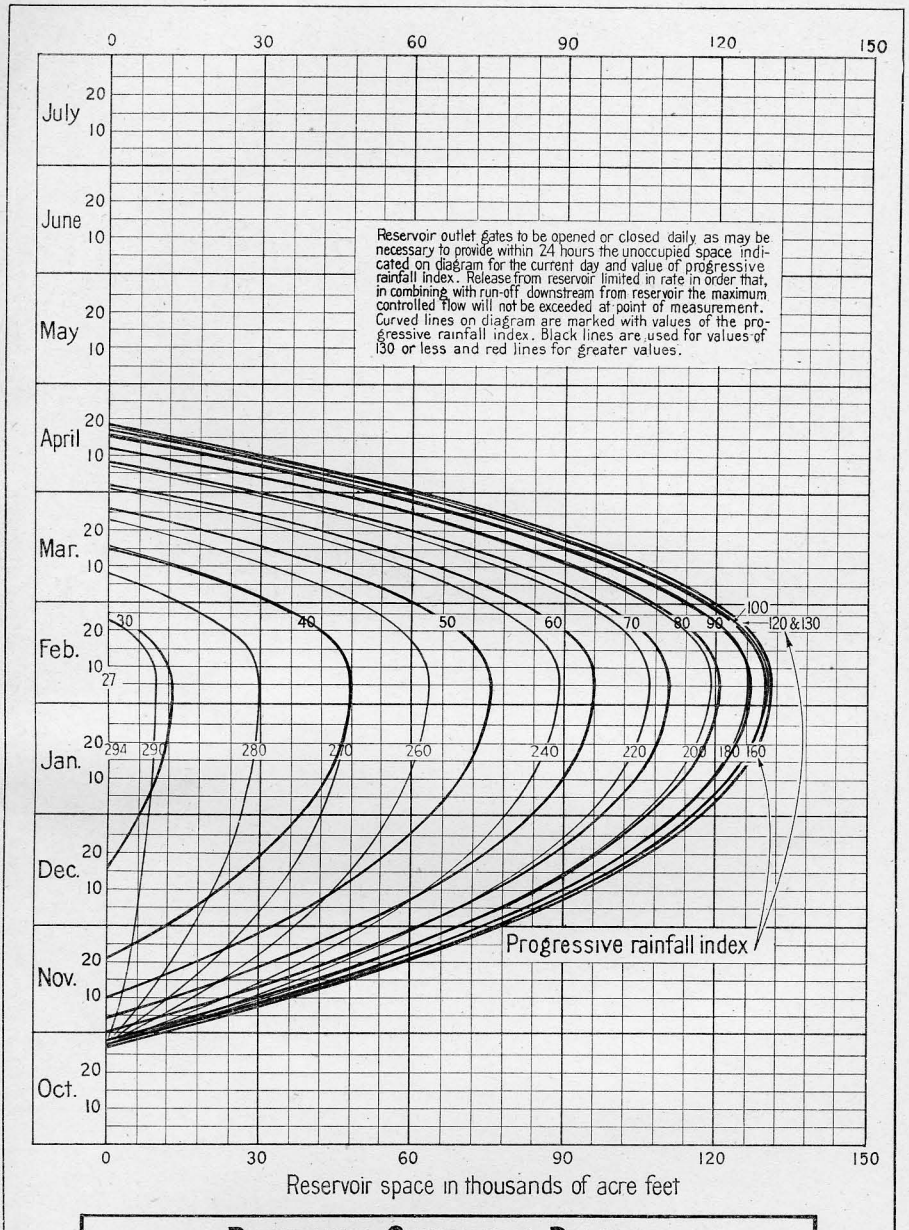
The index values with which the maximum reservoir space is needed were obtained from Plate XVII, p. 67. Here the intersections of the full and dotted-line curves labeled 30 per cent (10,700 second-feet) for rain-water floods and 40 per cent (14,200 second-feet) for snow-water floods indicate values between 110 and 122 as being most favorable for the need of reservoir space to control both rain and snow-water floods. These are the index values of the outside curves of the diagram. The index values for the extreme inside curves are taken from the same plate. On the part pertaining to rain-water floods, the intersections of the two 30 per cent (10,700 second-feet) curves, one dotted and one full-line, with the vertical representing two days in 100 years on which values will be exceeded, indicate limiting values of the index of 49 and 183. Reservoir space is not needed to control floods with either smaller or larger values than these. On the part of the figure pertaining to snow-water floods, the corresponding limiting values are found to be 73 and 139. The index values for the several interior curves on the operating diagram are interpolated between these and the values for the outside curve the same way as for the diagrams of the Sacramento and Mokelumne rivers.

Reservoir operating diagram for controlling floods on San Gabriel River.

Plate XXI, "Reservoir Operating Diagram for Controlling Floods on San Gabriel River," delineates the rule for operating a reservoir on this stream in order to control floods with least interference in its conservation use. Like the diagrams for the Sacramento, Mokelumne and San Joaquin rivers, that for the San Gabriel indicates the space that should be empty on each day of the flood season for the amount of seasonal precipitation to date, in order that excess flood waters may be detained. The curves in black indicate the space that should be empty when the value of the progressive rainfall index is less than 120 and the red curves the space when the value is greater than 130. The diagram assumes that the reservoir outlet gates will be opened and closed as may be necessary to provide within 24 hours as nearly as possible, without causing the desired regulated flow to be exceeded, the empty space indicated on the diagram for the current day and value of progressive rainfall index.

The San Gabriel River diagram is like that for the Sacramento River in that it does not provide for the control of snow-water floods. The snow on the San Gabriel drainage area that lasts until early summer is too small in quantity to do more than help sustain the summer flow of the stream when it melts.

The diagram applies to any reservoir whose dam is within a distance of about 5 miles upstream from the Azusa gaging station, the point of measurement. A capacity of 131,000 acre-feet available for flood control purposes would be required. The application of the rule to the operation of a reservoir of this or greater capacity would result in limiting flood flows to 1900 second-feet at Azusa gaging station. A much larger flow than this will pass safely down the channel of the San Gabriel River to the ocean but it could not all be conserved. It is



RESERVOIR OPERATING DIAGRAM FOR CONTROLLING FLOODS ON SAN GABRIEL RIVER

MAXIMUM CONTROLLED FLOW NEAR AZUSA- 1,900 SEC. FT.

CURVES SHOW SPACE NEEDED AT VARYING TIMES OF YEAR AND VALUES OF PROGRESSIVE RAINFALL INDEX TO ABSORB EXCESSIVE FLOOD FLOWS.

believed that flows up to 1900 second-feet may be conserved conveniently by sinking them into the large underground basin of the San Gabriel Valley. This makes it desirable to reduce the San Gabriel River floods to a much smaller flow than on the other illustrative streams.

The largest flood in the thirty years of stream flow record at Azusa occurred on January 18, 1916, with a crest flow of 40,000 second-feet. This is 38,100 second-feet greater than the controlled flow that would result from the application of the diagram. The greatest mean daily flow of the 1916 flood was 22,300 second-feet.

The diagram for the San Gabriel River was constructed from the analytical graphs of Chapter IV in a manner similar to that employed in the construction of diagrams for the other three illustrative streams. Instead, however, of using the probability that the desired maximum controlled flow may be exceeded on an average of one day in 50 years in taking information from the charts as in the preparation of the other diagrams, a frequency of one day in a thousand years was selected because of the greater property values and population concentrating below the San Gabriel dam. The records of the United States Weather Bureau rainfall station at Claremont* were used in computing values of the progressive rainfall index for the San Gabriel River. This is the station that should be used in the application of the diagram.

The apex of the outside curve on the San Gabriel diagram has its position determined on the reservoir space scale from the largest empty space that is required under the most severe circumstances as shown on the lower figure of Plate X, p. 55. The intersection of the 10 per cent curve (1900 second-feet) with the vertical representing full control except on an average of 0.1 day in 100 years (one day in 1000 years) shows that the maximum reservoir space required is 344 per cent of the greatest daily run-off of a once-in-25-year flood (131,000 acre-feet). Its position on the time scale is fixed by the date most favorable for the need of reservoir space for the control of floods. This is taken from the lower cut on Plate XIII, p. 63. The intersection of the dotted and full-line curves labeled 10 per cent (1900 second-feet) indicates February 7th as the most favorable date.

The positions of the arms of the outside curve of the diagram are also determined from Plate XIII, p. 63. Here the dotted and full-line curves labeled 10 per cent (1900 second-feet) intersect the vertical of 0.1 day exceptional behavior in 100 years (one day in 1000 years) on October 27th and April 19th, respectively. These are the limiting dates of the flood season before and after which reservoir space is not needed for the control of floods to the degree selected.

The value of the progressive rainfall index with which the greatest reservoir space is needed is taken from the lower figure of Plate XV, p. 65. The intersection of the full and dotted-line curves labeled 10 per cent (1900 second-feet) marks the index value 122 as being most favorable for the need of reservoir space. The outside curve that indicates the need of most space is given a value of from 120 to 130.

* Claremont is a cooperative station of the United States Weather Bureau and one of the principal stations in precipitation division W of which the San Gabriel drainage basin is part. See Chap. II, Bul. No. 5, "Flow in California Streams," issued by Division of Engineering and Irrigation, State Department of Public Works.

The index value for the extreme inside curve is taken from the same plate. The intersections of the two curves, one dotted and one full-line, labeled 10 per cent (1900 second-feet) with the vertical on the extreme left representing an exceptional behavior of 0.1 day in 100 years (one day in 1000 years), give limiting values for the index of 27 and 294. Reservoir space is not needed for controlling floods when the index is either smaller or larger than these values. Therefore, 27 and 294 are the index values of the black and red curves respectively that are coincident with the line of zero reservoir space. The other interior curves are interpolated in position between these and the outside curve as in the construction of the diagrams for the other three illustrative streams.

Performance of the four illustrative reservoir operating diagrams in controlling floods, not coordinated with conservation.

The performance in controlling floods of the four reservoir operating diagrams just described has been tested by applying them respectively to the records of daily flow on each of the four illustrative streams. It was assumed that a reservoir of required capacity existed at the point of measurement on each stream, that it was full at the beginning of each flood season, that it was held as nearly full as the diagram would permit during the succeeding flood season, and that water was released from storage only as required to gain the empty space indicated on the diagram. The following tables show for all* the largest floods of record, both rain and snow-water, the dates on which the reservoirs would have been nearest full and the amount of space still empty on those days.

It may be noted that all floods of record on the four illustrative streams would have been controlled without the reservoirs overflowing except a small fall flood on the San Joaquin, occurring on October 2, 1918, with a discharge of only 200 second-feet in excess of the maximum controlled flow. On the Sacramento River even the historic floods of March 20, 1907, and February 3, 1909, would have been controlled with 53,500 and 188,800 acre-feet of space to spare respectively at the times the reservoir was nearest full. The average space to spare at the times nearest full while controlling all floods on the Sacramento River during the entire thirty years of record would have been equal to half the space required under the most severe circumstances.

* All floods exceeding the desired maximum regulated flow are listed when their number is less than twenty, otherwise the twenty largest are tabulated.

SACRAMENTO RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING ALL FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1895-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 125,000 second-feet maximum near Red Bluff		
Date	Mean daily flow in second-feet near Red Bluff	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (454,000 acre-feet)
Feb. 3, 1909	254,000	Feb. 4, 1909	188,800	42
Feb. 2, 1915	249,000	Feb. 2, 1915	200,900	44
Mar. 20, 1907	196,000	Mar. 21, 1907	53,500	12
Jan. 16, 1909	188,000	Jan. 18, 1909	191,400	42
Feb. 16, 1904	188,000	Feb. 16, 1904	357,700	79
Jan. 21, 1909	177,000	Jan. 21, 1909	150,700	33
Feb. 25, 1917	176,000	Feb. 25, 1917	109,300	24
Feb. 21, 1914	160,000	Feb. 21, 1914	119,600	26
Jan. 1, 1914	151,000	Jan. 2, 1914	129,900	29
Feb. 24, 1902	151,000	Feb. 26, 1902	289,100	64
Mar. 8, 1904	147,000	Mar. 8, 1904	332,400	73
Feb. 10, 1902	140,000	Feb. 12, 1902	327,600	72
Mar. 31, 1906	137,000	Mar. 31, 1906	105,500	23
Jan. 19, 1906	136,000	Jan. 19, 1906	143,600	32
Feb. 4, 1907	134,000	Feb. 4, 1907	433,500	95
Jan. 25, 1903	131,000	Jan. 25, 1903	431,700	95
Mar. 7, 1911	130,000	Mar. 7, 1911	368,400	81
Jan. 27, 1896	128,000	Jan. 27, 1896	341,500	75
Average			237,500	52

MOKELUMNE RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING TWENTY LARGEST RAIN WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1904-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 5300 second-feet maximum near Clements		
Date	Mean daily flow in second-feet near Clements	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (92,000 acre-feet)
Jan. 30, 1911	16,700	Feb. 1, 1911	35,200	38
Mar. 19, 1907	15,310	Mar. 27, 1907	7,100	8
Jan. 26, 1914	11,100	Jan. 27, 1914	68,900	75
Jan. 14, 1909	10,400	Jan. 17, 1909	5,200	6
Feb. 21, 1914	9,850	Feb. 21, 1914	82,700	90
Feb. 6, 1925	9,700	Feb. 6, 1925	27,800	30
Jan. 1, 1914	9,250	Jan. 1, 1914	36,100	39
Jan. 21, 1909	8,400	Jan. 22, 1909	8,500	9
Mar. 20, 1916	8,040	Mar. 21, 1916	64,400	70
Feb. 2, 1907	7,860	Feb. 4, 1907	79,300	86
Mar. 31, 1906	7,750	April 1, 1906	49,600	54
Mar. 23, 1907	7,610	Mar. 27, 1907	7,100	8
Jan. 22, 1914	7,470	Jan. 22, 1914	78,600	85
Jan. 18, 1921	7,350	Jan. 18, 1921	75,700	82
Mar. 7, 1911	7,210	Mar. 11, 1911	70,900	77
Nov. 21, 1909	7,200	Nov. 21 1909	0	0
Feb. 11, 1919	7,060	Feb. 11, 1919	29,000	32
Jan. 19, 1906	6,960	Jan. 19, 1906	24,400	27
Mar. 12, 1918	6,940	Mar. 12, 1918	9,400	10
April 16, 1925	6,910	April 17, 1925	6,600	7
Average			38,300	42

MOKELUMNE RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING ALL SNOW WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1904-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 7100 second-feet maximum near Clements		
Date	Mean daily flow in second-feet near Clements	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (13,000 acre-feet)
June 12, 1906	8,740	June 13, 1906	1,900	15
June 18, 1911	8,030	June 18, 1911	3,300	25
June 3, 1922	7,970	June 5, 1922	2,600	20
June 12, 1911	7,960	June 12, 1911	3,100	24
June 6, 1911	7,880	June 6, 1911	4,000	31
May 31, 1922	7,770	June 1, 1922	6,700	52
June 1, 1915	7,750	June 1, 1915	10,000	77
May 18, 1922	7,670	May 19, 1922	1,800	14
June 16, 1906	7,600	June 17, 1906	4,500	35
June 10, 1917	7,550	June 10, 1917	2,900	22
May 24, 1911	7,500	May 24, 1911	800	6
July 4, 1906	7,480	July 4, 1906	1,100	8
Average			3,600	28

SAN JOAQUIN RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING ALL RAIN WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1907-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 10700 second-feet maximum near Friant		
Date	Mean daily flow in second-feet near Friant	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (133,000 acre-feet)
Jan. 31, 1911	38,800	Feb. 1, 1911	14,200	11
Dec. 31, 1909	27,900	Jan. 1, 1910	43,600	33
Jan. 14, 1909	26,800	Jan. 15, 1909	16,400	12
Dec. 10, 1909	26,800	Dec. 10, 1909	28,200	21
Jan. 26, 1914	24,700	Jan. 30, 1914	13,800	10
Jan. 21, 1909	18,900	Jan. 22, 1909	62,700	47
Mar. 8, 1911	18,800	Mar. 8, 1911	67,400	51
Mar. 10, 1911	13,600	Mar. 12, 1911	55,900	42
Feb. 12, 1909	12,500	Feb. 14, 1909	104,100	78
Feb. 21, 1917	11,700	Feb. 21, 1917	100,700	76
April 6, 1911	11,600	April 6, 1911	0	0
Jan. 18, 1916	11,000	Jan. 20, 1916	113,100	85
Mar. 21, 1916	11,000	Mar. 21, 1916	15,100	11
Oct. 2, 1918	10,900	Oct. 2, 1918	0	0
Jan. 25, 1911	10,700	Jan. 25, 1911	79,300	60
Average			47,600	36

SAN JOAQUIN RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING ALL SNOW WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1907-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 14200 second-feet maximum near Friant		
Date	Mean daily flow in second-feet near Friant	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (177,000 acre-feet)
June 13, 1911	23,100	June 23, 1911	21,100	12
June 4, 1909	22,800	June 8, 1909	89,100	50
June 16, 1911	21,500	June 23, 1911	21,100	12
July 7, 1911	19,500	July 7, 1911	57,600	33
June 5, 1922	16,700	June 8, 1922	149,700	85
May 22, 1911	16,200	May 23, 1911	134,600	76
June 6, 1911	16,200	June 8, 1911	165,500	94
May 8, 1909	16,200	May 8, 1909	39,300	22
June 2, 1914	15,700	June 2, 1914	167,500	95
June 5, 1912	15,300	June 5, 1912	33,000	19
June 15, 1909	14,900	June 15, 1909	95,000	54
June 27, 1911	14,700	June 28, 1911	38,200	22
May 31, 1922	14,700	June 1, 1922	171,200	97
June 24, 1909	14,600	June 24, 1909	129,300	73
Average			93,700	53

SAN GABRIEL RIVER

UNUSED RESERVOIR SPACE

WHILE CONTROLLING TWENTY LARGEST FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1895-1926

Not Coordinated with Conservation

Maximum flood flow—uncontrolled		Flow controlled to 1900 second-feet maximum near Azusa		
Date	Mean daily flow in second-feet near Azusa	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (131,000 acre-feet)
Jan. 18, 1916	22,300	Jan. 20, 1916	45,300	35
Dec. 19, 1921	16,000	Dec. 25, 1921	25,000	19
Jan. 1, 1910	12,500	Jan. 3, 1910	82,100	63
Feb. 20, 1914	11,800	Mar. 1, 1914	64,500	49
Mar. 12, 1905	11,130	Mar. 14, 1905	87,100	66
Mar. 26, 1906	9,430	Mar. 29, 1906	29,100	22
Mar. 10, 1911	9,160	Mar. 14, 1911	71,400	54
Jan. 26, 1914	9,150	Jan. 27, 1914	99,200	76
Feb. 9, 1922	8,200	Feb. 13, 1922	68,900	53
Mar. 12, 1906	8,020	Mar. 13, 1906	88,900	68
Jan. 27, 1916	7,940	Jan. 30, 1916	37,100	28
Feb. 7, 1909	7,100	Feb. 8, 1909	118,100	90
Mar. 5, 1907	6,810	Mar. 11, 1907	89,900	69
April 1, 1903	5,920	April 2, 1903	95,400	73
Dec. 27, 1921	5,900	Dec. 29, 1921	12,700	10
Jan. 29, 1911	5,260	Jan. 29, 1911	80,400	61
Jan. 18, 1914	5,110	Jan. 18, 1914	103,000	79
Mar. 11, 1918	5,030	Mar. 14, 1918	21,500	16
Jan. 10, 1907	4,670	Jan. 11, 1907	108,600	83
Jan. 31, 1911	4,220	Jan. 31, 1911	76,200	58
Average			70,200	54

On the Mokelumne River, the large flood of January 30, 1911, would have been reduced from 20,600 second-feet to 5300 second-feet with 35,200 acre-feet of empty space in the reservoir to spare at the time the reservoir was nearest full. The average spare space at the times nearest full while controlling the twenty largest rain-water floods on the Mokelumne River would have been 42 per cent of the maximum required by the diagram. One small flood in the fall of 1909 would have just filled the reservoir but there would have been more space than needed while controlling all other floods.

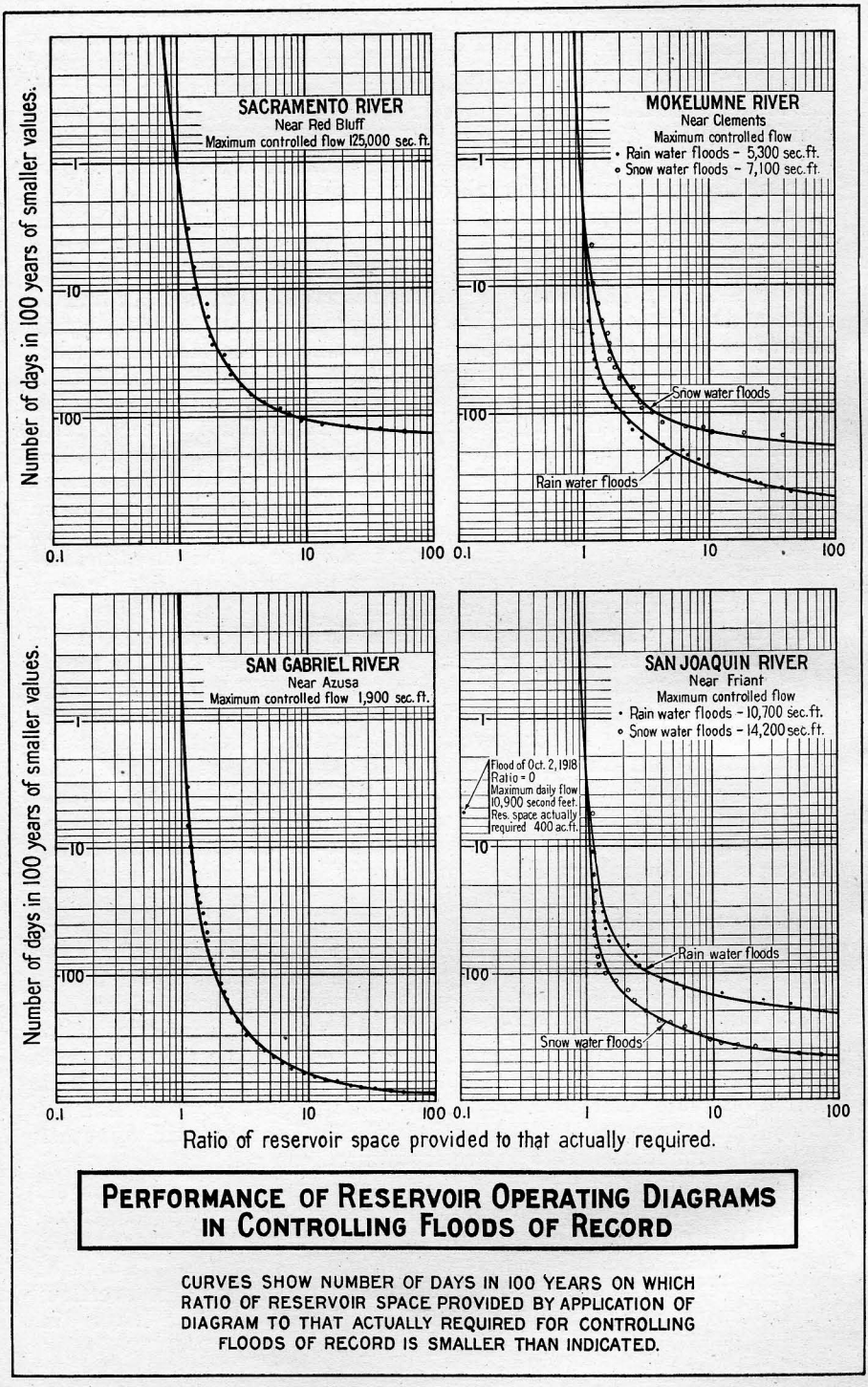
On the San Joaquin River, the largest flood during the eighteen years of record (January 31, 1911) would have been reduced from a mean daily flow of 38,800 second-feet to 10,700 second-feet without the use of the top 14,200 acre-feet in the reservoir. The average unused space at the times the reservoir was nearest full while controlling all rain-water floods would have been 36 per cent of the maximum space required by the diagram. There would have been space to spare while controlling all floods during the eighteen years of record except for two small floods barely larger than the controlled flow. One of these occurred before the opening date of the flood season, on October 2, 1918, and the other on April 6, 1911, the closing date of the flood season. All the snow-water floods of record on the San Joaquin River would have been controlled without the reservoir filling to within 21,100 acre-feet of the top. The average space to spare at the times nearest full while controlling snow-water floods would have been 53 per cent of the maximum required by the diagram.

On the San Gabriel River, the large flood of January 18, 1916, would have been controlled without the use of the top 45,300 acre-feet of reservoir space. The nearest the reservoir would have filled while controlling all floods during the 30 years of record would have been to 12,700 acre-feet of a full reservoir. The average unused space at the times nearest full during the twenty largest floods of record would have been 54 per cent of the maximum required by the diagram.

The full test of the four reservoir operating diagrams is expressed graphically on Plate XXII, "Performance of Reservoir Operating Diagrams in Controlling Floods of Record." The ratio of the empty reservoir space provided by application of the diagrams to that actually necessary to control the remainder of the flood was computed for every day of stream-flow record on each of the four illustrative streams. The ratios on each stream were arranged in order of increasing magnitude and the number smaller than each successive size counted. These counts were increased by proportion to the number had the stream-flow records been 100 years in length. Assuming that the trend of these figures expresses the average relations of the future, these counts were plotted on Plate XXII to show the probable frequency with which the empty space provided by application of the diagrams will approach the exact amount needed to secure the desired control.

Plate XXII indicates that the Sacramento River diagram would probably provide, on the average, more than twice the empty reservoir space actually required on all days except 30 in each 100-year period, more than half again as much as needed on all days except 12 in each 100-year period and that its reservoir would probably fill to overflowing about one day in each 80 years. For the Mokelumne River dia

PLATE XXII.



PERFORMANCE OF RESERVOIR OPERATING DIAGRAMS IN CONTROLLING FLOODS OF RECORD

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RATIO OF RESERVOIR SPACE PROVIDED BY APPLICATION OF DIAGRAM TO THAT ACTUALLY REQUIRED FOR CONTROLLING FLOODS OF RECORD IS SMALLER THAN INDICATED.

gram, the indications are that probably more than twice the empty space actually needed would be provided on the average on all days except 100 in 100 years for rain-water floods and 50 in 100 years for snow-water floods; at least fifty per cent more than actually needed on all days except 60 in 100 years for rain-water floods and 24 in 100 years for snow-water floods; and that the reservoir would fill to overflowing on two to three days in 100 years for both rain and snow-water floods. The indications for the San Joaquin River diagram are that, on the average, probably more than twice the empty space actually needed would be provided on all days except 70 in 100 years for rain-water floods and 150 in 100 years for snow-water floods; at least half again as much as needed on all days except 43 in 100 years for rain-water floods and 100 in 100 years for snow-water floods; and that the reservoir would probably fill to overflowing on three days in 100 years for both rain and snow-water floods. For the San Gabriel River, the indications are that probably more than twice the empty space needed would be provided on all days except 120 in each 100-year period at least 50 per cent more than actually needed on all days except 50 in each 100 years, and that the reservoir would probably fill to overflowing on about one day in each 500 years.

These tests agree fairly closely with the probability of exceptional behavior selected for construction of the diagrams. On the Sacramento, Mokelumne and San Joaquin rivers, by construction, the controlled flow for both rain and snow-water floods would be expected to be exceeded on an average of one day in 50 years. By test against the period of record the desired controlled flow of the Sacramento River diagram would probably be exceeded on an average of one day in 80 years and the Mokelumne and San Joaquin river diagrams on an average of one day in 30 to 40 years for both rain and snow-water floods. The desired controlled flow of the San Gabriel River diagram by construction would be expected to be exceeded on an average of one day in 1000 years. By test against the period of record the probable exceptional behavior of this diagram is one day in 500 years.

CHAPTER VI.

EFFECT ON CONSERVATION OF CONTROLLING FLOODS BY RESERVOIR OPERATING DIAGRAM.

Effect determined by direct test.

Four reservoir operating diagrams are described in chapter V, one for controlling floods on each of the four streams previously used to illustrate the characteristics of flood occurrence. These diagrams indicate the reservoir space for all conditions of prior rainfall, that should be empty on each day of the flood season in order to detain flow that may occur in excess of a specified maximum rate. Subsequent to the central date of the flood season, less empty space is required as the season progresses toward its close. The diagrams are constructed to release this reserved space as quickly as possible without sacrifice in the effectiveness of flood control. Therefore, until some analysis is developed that fits the characteristics of flood occurrence closer than the one herein described, it may be said that reservoir operation in accord with these diagrams secures the control of floods with a minimum interference with the use of the same space for conservation.

To what extent, if any, the reservation of the varying amounts of space indicated on the diagrams may interfere with its use for conservation is not apparent. The amount of the reservations relative to the volume of subsequent run-off determines this in each instance. Therefore, it is evident that the degree of flood control desired and the regimen of the stream are important factors in determining the extent of interference, if any. Other factors are the size of the reservoir and the manner of its operation. If the total capacity of the reservoir were several times the largest reserve required for flood control, there would be many days on which the empty space due to normal operation for conservation would exceed that required for flood control. At such times there could be no interference with conservation by reason of the use of the same space for flood control. Therefore, the larger the total capacity of the reservoir in proportion to the maximum flood control reserve, the less is the opportunity for interference. Likewise the opportunity of interference is less, the greater the seasonal drawdown in the reservoir or the smaller the spring draft subsequent to the central date of the flood season during normal operation for conservation. Because of the complication of these relations, the determination of the effect on conservation of controlling floods by the reservoir operating diagrams must be made through the analysis of each specific proposal. The interference or approach toward interference might well be different for each stream, each degree of flood control, and each size of reservoir and manner of operating it for conserving water.

The succeeding pages of this chapter are devoted to the presentation of analyses of the effect on the water and power yield of combining flood control with several modes of operating four specific reservoirs, one on each of the illustrative streams. In these studies each reservoir is assumed to have been in existence at the beginning of continuous

measurement of flow on its stream and to have been operated for conservation in a specific manner through the entire period of stream flow record both with and without flood control. The effect on conservation in these instances of the use of the same space for both flood control and conservation is determined by a comparison of the yield of water and power in the two parallel sets of computations. In these computations the inflow, evaporation and drafts from the reservoirs are balanced daily and the new reservoir levels tabulated both with and without the reservation of space for flood control in accord with the operating diagrams. In doing this the daily values of the progressive rainfall indices are computed from rainfall records and the flood control feature applied just as though the reservoirs had been operated through these years according to the rules laid down by the reservoir operating diagrams. All conditions are held the same in the two parallel sets of computations except for the inclusion of the flood control feature in one set.

Tables are included herein summarizing these computations and comparing the yields of water and power month by month and year by year through the entire period of run-off record. Graphical comparisons are also included of the reservoir levels with and without flood control and of the stream flow below the dam, controlled, as well as that unimpaired by reservoir construction.

Kennett Reservoir on Sacramento River.

The "Coordinated Plan" * for development of the State's waters presented to the 1927 session of the State Legislature proposes, among others, that a reservoir be constructed on the main Sacramento River with its dam near Kennett, about five miles below the confluence with the Pit River. The plan proposes that the dam be constructed to an initial height of 420 feet. This would impound 2,940,000 acre-feet of water. A power plant of 400,000 k. v. a. capacity would be constructed near the base of the dam.

The "Coordinated Plan" is distinguished from other plans in that its reservoirs would be operated coordinately for several different purposes in a way to subserve the best interests of the State. The Kennett reservoir would be operated coordinately for the benefit of irrigation and domestic supply, navigation, salinity control, generation of power and the control of floods. During the first period of years while the demand for water is growing to meet its large yield, the Kennett reservoir would be operated to secure the most valuable power output while at the same time limiting floods to half the largest on record. In so doing, for a number of years to come, there would be adequate water in the discharge from the power plant for the needs of irrigation, domestic supply, navigation and for salt water control in all except extremely dry years. Later, the increased demand for water will require that the operation of the reservoir be changed over to yield the greatest volume of water equalized in accord with the irrigation demand while at the same time meeting the other needs. The generation of power would become incidental to the yield of water. So

* See Bul. No. 12, "Summary Report on the Water Resources of California and a Coordinated Plan for their Development," Division of Engineering and Irrigation, State Department of Public Works.

operated, the initial height of dam would equalize for irrigation use three-fifths of the mean annual run-off of the stream and produce on an average 159,400* kilowatts of electric energy.

The yield of the Kennett reservoir in water and power for several heights of dam together with a full description of its uses is contained in Bulletin No. 15, "The Coordinated Plan of Water Development in the Sacramento Valley." The results of computations for several heights of dam are there tabulated. No special entries are included for navigation water nor for water for salinity control since their needs would be more or less coincident with the irrigation demand. They are regarded as part of this demand for estimating purposes. Likewise, no special entries are made for domestic water supply because its volume would be relatively small. The effect of the inclusion of the flood control feature of the "Coordinated Plan" upon the yield of a reservoir with a 420-foot dam, the initial height proposed, is analyzed in the following pages.

Plate XXIII, "Effect of Controlling Sacramento River Floods upon Stage of Kennett Reservoir," compares the reservoir stage day by day had it been in existence in the year 1895 and been operated continuously to January, 1926, as proposed in the "Coordinated Plan," with the stage had the flood control feature been omitted. This period of comparison is the extent of continuous records of stream flow on the Sacramento River. The comparison is delineated by lines extending across the plate in four rows. Each line represents a separate mode of operation. These lines fluctuate up and down and indicate by their vertical position the acre-feet of water in storage in the reservoir on each day of the thirty-year period under the several different modes of operation. The top guide line of each row represents a full reservoir and the bottom line an empty reservoir. The space between each pair of guide lines represents 200,000 acre-feet of capacity.

The heavy black line extending across each row indicates the reservoir stage had the most valuable power output been generated as proposed in the first or temporary mode of operation under the "Coordinated Plan." A dash and dot black line indicates the stage had the greatest yield of irrigation water been obtained with electric power as an incidental product as proposed in the second or permanent mode of operation under the "Coordinated Plan." These lines approximate operation as proposed by the "Coordinated Plan" except that the flood control feature is omitted.

The reservoir stage resulting from the introduction of the flood control feature is delineated by red lines. The light red line indicates the stage had the reservoir been operated for flood control alone in accordance with the rule developed in the fore part of this volume and expressed on Plate XVIII, "Reservoir Operating Diagram for Controlling Floods on Sacramento River," p. 76.

The heavy full red line indicates the departures in reservoir stage by reason of the inclusion of the flood control feature in the first or temporary mode of operation under the "Coordinated Plan." The light dash and dot red line indicates similarly the departures by reason of the inclusion of the flood control feature in the second or permanent mode of operation under the "Coordinated Plan." Where the light

* Average for the 54-year period, 1871–1925.

ALEXANDER

EFFECT OF CONTROLLING SACRAMENTO RIVER FLOODS
UPON
STAGE OF KENNETT RESERVOIR
IF OPERATED PRIMARILY FOR EITHER IRRIGATION OR POWER DRAFT

MAXIMUM CONTROLLED FLOW AT RED BLUFF 125,000 SEC. FT.
MAXIMUM FLOOD OF RECORD 278,000 SEC. FT.
RESERVOIR CAPACITY 2,940,000 AC. FT.
HEIGHT OF DAM 420 FT.

dash and dot red line coincides with the heavy full red line, both are represented by a heavy dash and dot red line.

Below the reservoir stage lines in each row are drafted to a special scale superimposed on the reservoir stage scale, a light black line showing the fluctuations of the stream flow unimpaired by reservoir storage and a light red line showing the stream flow as controlled by the second or permanent mode of operation under the "Coordinated Plan." Similarly, a black dotted line delineates the values of the progressive rainfall index that were used with the reservoir operating diagram (Plate XVIII) in computing the stage of the reservoir with the flood control feature included.

The greatest empty depth required for flood control during each season is noted on the graph in feet below full reservoir level. The largest is seen to be 21 of the 415 feet depth behind the dam when the reservoir is full. This was required during 13 of the 30 seasons. In 7 of the seasons there was no special lowering of the reservoir level for flood control since the empty space by reason of conservation operations was larger than required for flood control. The average amount of depression was about 11 feet, or 2.6 per cent, of the depth of a full reservoir at the dam. Of the entire elapsed time during the 30 seasons, the reservoir level would have had to be depressed especially for flood control only one-sixth of the time while operating primarily for power generation and one-eighth of the time while operating primarily for irrigation.

The effect of including the flood control feature of the "Coordinated Plan" upon the reservoir stage resulting from conservation operations is seen to be small, yet very substantial reduction in flood volume is obtained. The largest flood of record occurred in February, 1909. It reached a crest discharge of 278,000 second-feet. The flood control feature of the "Coordinated Plan" would have limited this flood to a discharge of 125,000 second-feet. Likewise the floods of ten other seasons of record that exceeded 125,000 second-feet would have been limited to this rate of discharge.

The effect upon the water and power yield of the Kennett reservoir in securing this limitation to flood flows is disclosed by comparison of parallel sets of computations, one with and the other without the flood control feature of the "Coordinated Plan." These computations of yield were carried out as described in Bulletin No. 15, "The Coordinated Plan of Water Development in the Sacramento Valley," except that they were made on a daily instead of a monthly basis. The set of computations with the flood control feature included had to be made on a daily basis because the reservoir operating diagrams require a daily adjustment of reservoir stage during the flood season. Therefore, in order to make the two sets of computations exactly comparable, both were carried through the entire 30 years on a daily basis. The assumptions employed are listed on page 216 herein.

The water yield (without deduction for prior rights downstream from the dam and with deficiencies in supply on an average of one year in ten) computed on a daily basis is identical with that of Bulletin No. 15 computed on a monthly basis except that the deficiencies in per cent of a full supply are increased from 0.1 to 0.3 per cent in three out of the five deficient seasons. The power yield, however, is about

3 per cent less when computed day by day rather than by monthly averages. It was 2.3 per cent less when operating primarily for power generation and 3.7 per cent less when power generation is incidental to irrigation use. This results from the assumption in the monthly computations that flow is available for power generation as an average monthly quantity instead of with the large daily fluctuations that sometimes occur. At times when the reservoir is full, some of this water included in the monthly averages actually would have passed over the spillway instead of through the turbines. Therefore, the computations on a monthly basis show somewhat more water running through the power turbines than actually could have passed through them.

The stream flow data employed in these computations are the estimated mean monthly discharges at the Kennett dam site with the entire flow of the Pit River above Bieber deducted but without deduction for prior rights downstream from the dam. These are published in Bulletin No. 15, "The Coordinated Plan of Water Development in the Sacramento Valley." For the purposes of computing the yield of the reservoir on a daily basis, these estimated monthly means were divided into daily discharges bearing the same relation to the corresponding daily flows measured at the Red Bluff gaging station as the estimated mean monthly flows at the Kennett dam site bear to the corresponding mean monthly flows measured at Red Bluff.

Summaries are prepared of these computations comparing the water and power yield of the Kennett reservoir in the "Coordinated Plan," with and without the flood control feature. Those by years follow herewith but those by months, because of their size, have been assembled in the last chapter of this volume.

It may be observed upon reviewing these tables that the inclusion of the flood control feature of the "Coordinated Plan" has practically no effect upon the yield of the Kennett reservoir either in water or power. The water yield equalized for irrigation use, both with and without flood control, is identical either in the temporary or permanent mode of operating the reservoir. The power yield is 0.9 per cent less under the temporary and 0.2 per cent greater under the permanent mode of operation, all in the secondary output. These differences are very small and are discernible only because of the minute comparisons made to detect them. They are much smaller than the error contained in the usual computations of power output that are based on monthly averages of stream flow.

The slightly less power output under the temporary mode of operation when flood control is included, results from the extra water that may be run through the turbines while the reservoir level is depressed for flood control, being insufficient at times to compensate for the slight reduction in power head. The table shows that this occurs at times during 16 of the 30 years. In 7 of the years the extra water available while the reservoir level is depressed for flood control is sufficient to develop a greater power output with flood control than without. In the remaining 7 years the reservoir stage is not affected by the inclusion of the flood control feature since the empty space, by reason of conservation operations, is at all times greater than needed for flood control. Under such circumstances the power yield with and without flood control is identical. The greatest difference in power

yield with and without flood control in any year of the 30 analyzed is 6.7 per cent. This occurred in 1900. The average reduction in power head by the inclusion of flood control is 2.0 feet.

Under the permanent mode of operating the reservoir the power yield is greater with flood control than without because the extra volume of water that may be run through the turbines by reason of the inclusion of the flood control feature is more than sufficient to compensate for the small depression in head. The average reduction in power head that results from the depression of the reservoir level at times for flood control is 0.5 feet.

An alternate rule for controlling floods by reservoirs.

The rules for controlling floods by reservoirs described herein, grade with scientific nicety the flood control reserve in accord with the probable need for empty space to detain excess flood water. They were so constructed in order that the program of flood control evolved by the analysis would interfere as little as possible with conservation. It appears that, under some circumstances, this nicety of gradation in the amount of flood control reserve might be neglected without particular detriment to the reservoir yields. By holding the maximum empty space ever required, in reserve throughout each flood season until its close instead of varying it during the season with the changing value of the progressive rainfall index, results could be obtained at the Kennett reservoir not greatly different from those secured by the application of the reservoir operating diagram.

It is evident that such a rule would interfere with conservation very seriously under some circumstances, especially with a small reservoir. On the other hand, it is surprising how well it fits occurrences on the Sacramento River from 1895 to 1926 when applied to the size reservoir proposed at Kennett. The total reservoir capacity proposed at Kennett equals almost half the mean seasonal run-off and is about six times the maximum flood control reserve. In seasons of short run-off when it would seem that the nicety of gradation in the flood control reserve obtained by the operating diagram should be particularly valuable, it is found generally that conservation draft holds the reservoir below the level of the maximum flood control reserve. At such times flood control by either rule does not depress the reservoir level. Hypothetical seasons might be constructed in which this would not be so, however, the record of stream flow shows that none have occurred within the last thirty years. Should they occur, control by the reservoir operating diagram would interfere less with conservation than by the alternate rule.

The water and power yield of the Kennett reservoir holding the maximum flood control reserve (454,000 acre-feet) empty throughout the season (until April 8th) was computed in parallel to that without flood control and to that with control by the reservoir operating diagram. The yearly and monthly summaries of these computations are included with the others in the adjoining tables. The reduction in yield from that without flood control is small. In the temporary mode of operation under the "Coordinated Plan," the irrigation yield is identical but the primary power output is reduced 3.5 per cent. The secondary output, however, is increased 5.6 per cent so that the net

reduction in total power is 1.0 per cent. Under the permanent mode of operation, the average irrigation yield is reduced 0.3 per cent because of the larger deficiencies in seasons of short supply. In 1923 the deficiency is increased by 210,000 acre-feet, 5.0 per cent of the average seasonal yield. The incidental power* under the permanent mode of operation is reduced between 1 and 2 per cent.*

* A full set of computations of the incidental power yield while operating primarily for irrigation was not completed. However, it is estimated the average power head would be reduced about 7.0 feet and 20,000 to 40,000 acre-feet more water would pass through the turbines.

KENNETT RESERVOIR ON SACRAMENTO RIVER.

Table of Yearly Summaries of Water and Power Yield Computed on a Daily Basis.

Showing the effect of inclusion of the flood control feature of the "Coordinated Plan." (See Chapter VIII for corresponding monthly summaries.)

TABLE 1—Operating primarily for power generation with incidental irrigation. With and without flood control by reservoir operating diagram.

TABLE 2—Operating primarily for irrigation with incidental power generation. With and without flood control by reservoir operating diagram.

TABLE 3—Operating primarily for irrigation. Comparison for two methods of flood control.

TABLE 4—Operating primarily for power generation with incidental irrigation. Comparison for two methods of flood control.

TABLE 5—Summary of power yield. With and without flood control by either of two methods.

TABLE 1. KENNETT RESER

WATER AND POWER YIELD, OPERATING PRIMARILY

BOTH

WITH AND WITHOUT FLOOD CONTROL

Yearly Summary of Computations

(For corresponding monthly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of year in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1896	8,306,000	2,256,000	3,205,000	1,968,000	78,000	2,491,000	400	113,000	69,500	182,500
1897	6,052,000	2,820,000	3,204,000	1 662,000	78,000	1,671,000	401	113,400	59,100	172,500
1898	3,308,000	2,257,000	3,248,000	21,000	75,000	0	392	113,400	700	114,100
1899	5,050,000	2,221,000	3,206,000	990,000	78,000	299,000	400	113,400	34,900	148,300
1900	5,720,000	2,698,000	3,193,000	1,537,000	78,000	1,081,000	402	113,400	54,200	167,600
1901	5,724,000	2,529,000	3,196,000	1,312,000	78,000	1,289,000	401	113,400	46,300	159,700
1902	8,685,000	2,378,000	3,201,000	1,659,000	78,000	3,185,000	400	113,400	58,900	172,300
1903	6,848,000	2,940,000	3,182,000	1,632,000	78,000	1,990,000	404	113,400	58,200	171,600
1904	10,378,000	2,906,000	3,204,000	2,437,000	78,000	5,144,000	400	113,000	85,600	198,600
1905	6,823,000	2,421,000	3,204,000	1,429,000	78,000	2,276,000	400	113,400	51,000	164,400
1906	7,981,000	2,257,000	3,212,000	1,807,000	78,000	2,673,000	399	113,400	63,900	177,300
1907	8,877,000	2,468,000	3,208,000	1,822,000	78,000	3,891,000	399	113,400	64,500	177,900
1908	5,355,000	2,346,000	3,202,000	1,390,000	78,000	774,000	400	113,000	49,500	162,500
1909	10,871,000	2,257,000	3,203,000	2,116,000	78,000	5,053,000	400	113,400	74,800	188,200
1910	5,801,000	2,678,000	3,201,000	1,478,000	78,000	1,465,000	401	113,400	52,300	165,700
1911	6,383,000	2,257,000	3,212,000	1,446,000	78,000	1,655,000	398	113,400	51,500	164,900
1912	4,935,000	2,249,000	3,211,000	1,333,000	78,000	305,000	398	113,000	46,900	159,900
1913	5,017,000	2,257,000	3,201,000	1,189,000	78,000	253,000	400	113,400	42,100	155,500
1914	9,085,000	2,553,000	3,211,000	1,921,000	78,000	4,171,000	399	113,400	68,000	181,400
1915	9,454,000	2,257,000	3,214,000	1,853,000	78,000	4,094,000	398	113,400	65,500	178,900
1916	7,127,000	2,472,000	3,208,000	1,588,000	78,000	2,468,000	400	113,000	56,300	169,300
1917	4,705,000	2,257,000	3,215,000	897,000	78,000	515,000	397	113,400	32,000	145,400
1918	3,862,000	2,257,000	3,222,000	462,000	78,000	100,000	396	113,400	16,300	129,700
1919	5,306,000	2,257,000	3,211,000	905,000	78,000	1,185,000	399	113,400	32,400	145,800
1920	4,455,000	2,184,000	3,373,000	269,000	66,000	0	376	113,000	9,400	122,400
1921	6,255,000	2,931,000	3,199,000	1,447,000	78,000	2,139,000	400	113,400	51,600	165,000
1922	4,504,000	2,323,000	3,212,000	913,000	78,000	296,000	398	113,400	32,300	145,700
1923	3,294,000	2,328,000	3,223,000	133,000	78,000	0	398	113,400	4,600	118,000
1924	2,431,000	2,188,000	3,759,000	0	53,000	0	339	113,000	0	113,000
1925	5,420,000	807,000	3,361,000	337,000	78,000	211,000	381	113,400	12,100	125,500
Total	188,012,000		97,101,000	37,953,000	2,300,000	50,674,000				
Average	6,267,000		3,236,000	1,265,000	77,000	1,689,000	395.8	113,400	44,800	158,200

*Total primary power production in February of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 1a, page 218.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of year in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year
	Primary	Secondary					*Primary	Secondary	Total	
2,256,000	3,225,000	1,701,000	78,000	1,640,000	1,323,000	398	113,000	59,700	172,700	1896
2,595,000	3,227,000	1,552,000	78,000	1,175,000	358,000	396	113,400	54,300	167,700	1897
2,257,000	3,248,000	21,000	75,000	0	0	392	113,400	700	114,100	1898
2,221,000	3,209,000	994,000	78,000	388,000	14,000	399	113,400	35,000	148,400	1899
2,588,000	3,214,000	1,238,000	78,000	1,228,000	21,000	398	113,400	42,900	156,300	1900
2,529,000	3,221,000	1.174,000	78,000	1,402,000	0	397	113,400	40,400	153,800	1901
2,378,000	3,214,000	1,569,000	78,000	2,936,000	614,000	398	113,400	55,300	168,700	1902
2,652,000	3,210,000	1,647,000	78.000	1,834.000	130,000	399	113 400	57,800	171,200	1903
2,601,000	3,238,000	2,449,000	78,000	3,592,000	1,201,000	395	113,000	85,100	198,100	1904
2,421,000	3,217,000	1,504,000	78,000	1,903,000	285,000	397	113,400	53,100	166,500	1905
2,257,000	3,224,000	1,849,000	78,000	1,780,000	839,000	397	113,400	65,100	178,500	1906
2,468,000	3,230,000	2,042,000	78 000	3,044,000	605,000	395	113,400	71,400	184,800	1907
2,346,000	3,226,000	1,146,000	78,000	930,000	64,000	398	113,000	40,200	153,200	1908
2,257,000	3,217,000	2,099,000	78,000	4,785,000	312,000	397	113,400	73,600	187,000	1909
2,637,000	3,210,000	1,443,000	78,000	1,036,000	414,000	399	113,400	50,800	164,200	1910
2,257,000	3,228,000	1,443,000	78,000	1,217,000	425,000	396	113,400	50,800	164,200	1911
2,249,000	3,211,000	1,333,000	78,000	0	305,000	398	113,000	46,900	159,900	1912
2,257,000	3,216,000	1,093,000	78,000	137,000	197,000	398	113,400	38,500	151,900	1913
2,553,000	3,221,000	1,914,000	78.000	3,358,000	810,000	397	113,400	67,400	180,800	1914
2,257,000	3,224,000	1,964,000	78,000	2,509,000	1,464,000	396	113,400	69,000	182,400	1915
2,472,000	3,236,000	1,704,000	78,000	2,149,000	175,000	396	113,000	59,500	172,500	1916
2,257,000	3,220,000	770,000	78,000	178,000	459,000	397	113,400	27,400	140,800	1917
2,257,000	3,222,000	462,000	78,000	0	100,000	396	113,400	16,300	129,700	1918
2,257,000	3,223,000	1,020,000	78,000	919,000	139,000	396	113,400	36,000	149,400	1919
2,184,000	3,374,000	270,000	66,000	202,000	0	375	113,000	9,400	122,400	1920
2,727,000	3,218,000	1,391,000	78,000	1,936,000	36,000	397	113,400	48,900	162,300	1921
2,323,000	3,215,000	832,000	78,000	136,000	238,000	398	113,400	29,400	142,800	1922
2,328,000	3,223,000	133,000	78,000	0	0	398	113,400	4,600	118,000	1923
2,188,000	3,759,000	0	53,000	0	0	339	113,000	0	113,000	1924
807,000	3,361,000	337,000	78,000	0	211,000	381	113,400	12,100	125,500	1925
	97,481,000	37,094,000	2,300,000	40,414,000	10,739,000					Total
	3,249,000	1,236,000	77,000	1,347,000	358,000	393.8	113,400	43,400	156,800	Average

TABLE 2. KENNETT RESER

WATER AND POWER YIELD, OPERATING PRIMARILY

BOTH

WITH AND WITHOUT FLOOD CONTROL

Yearly Summary of Computations

(For corresponding monthly sum

Height of dam 420 feet.

Capacity of reservoir 2,940,000 acre-feet.

Year	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1896	8,306,000	1,860,000	4,276,000	65,000	5,286,000	1,678,000	0	375	178,400
1897	6,052,000	2,586,000	4,276,000	59,000	5,531,000	1,172,000	0	359	180,800
1898	3,308,000	1,408,000	4,189,000	43,000	3,149,000	0	87,000	342	91,200
1899	5,050,000	484,000	4,123,000	39,000	3,130,000	0	153,000	329	88,700
1900	5,720,000	1,372,000	4,276,000	55,000	4,723,000	327,000	0	337	145,500
1901	5,724,000	1,534,000	4,276,000	54,000	4,721,000	759,000	0	336	144,900
1902	8,685,000	1,268,000	4,276,000	61,000	5,051,000	1,919,000	0	361	166,300
1903	6,848,000	2,432,000	4,276,000	54,000	5,545,000	1,350,000	0	347	176,700
1904	10,378,000	1,872,000	4,276,000	65,000	5,055,000	4,108,000	0	372	170,200
1905	6,823,000	2,462,000	4,276,000	59,000	5,727,000	1,822,000	0	361	188,300
1906	7,981,000	1,206,000	4,276,000	69,000	4,713,000	1,491,000	0	378	161,500
1907	8,877,000	2,309,000	4,276,000	65,000	5,552,000	3,257,000	0	369	186,200
1908	5,355,000	1,795,000	4,276,000	58,000	5,170,000	302,000	0	353	166,000
1909	10,871,000	1,155,000	4,276,000	59,000	5,723,000	3,543,000	0	362	190,400
1910	5,801,000	2,216,000	4,276,000	55,000	5,383,000	911,000	0	347	171,100
1911	6,383,000	1,215,000	4,276,000	63,000	4,709,000	868,000	0	362	155,500
1912	4,935,000	1,447,000	4,276,000	61,000	4,032,000	83,000	0	360	130,200
1913	5,017,000	1,709,000	4,276,000	58,000	4,537,000	58,000	0	348	143,800
1914	9,085,000	1,611,000	4,276,000	65,000	5,729,000	2,744,000	0	370	192,800
1915	9,454,000	1,631,000	4,276,000	66,000	5,341,000	2,972,000	0	374	181,100
1916	7,127,000	2,138,000	4,276,000	59,000	5,627,000	1,798,000	0	358	183,300
1917	4,705,000	1,321,000	4,276,000	59,000	4,124,000	236,000	0	348	129,700
1918	3,862,000	1,132,000	4,276,000	50,000	3,158,000	0	0	354	96,400
1919	5,306,000	668,000	4,276,000	54,000	4,533,000	215,000	0	334	138,500
1920	4,455,000	719,000	3,121,000	24,000	1,979,000	0	1,155,000	315	53,400
1921	6,255,000	2,029,000	4,276,000	56,000	5,514,000	1,186,000	0	350	176,800
1922	4,504,000	1,059,000	4,276,000	56,000	3,801,000	0	0	342	116,700
1923	3,294,000	1,226,000	4,101,000	43,000	3,134,000	0	175,000	341	91,100
1924	2,431,000	376,000	2,136,000	13,000	1,072,000	0	2,140,000	283	25,600
1925	5,420,000	658,000	4,276,000	54,000	4,353,000	297,000	0	352	135,500
Total	188,012,000		124,570,000	1,641,000	136,102,000	33,096,000	3,710,000		
Average	6,267,000	.....	4,152,000	55,000	4,537,000	1,103,000	124,000	353.4	145,300

VOIR ON SACRAMENTO RIVER.

FOR IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 2a, page 234.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year
1,860,000	4,276,000	65,000	4,901,000	1,148,000	915,000	0	373	164,000	1896
2,586,000	4,276,000	59,000	5,616,000	916,000	171,000	0	358	181,900	1897
1,408,000	4,189,000	43,000	3,149,000	0	0	87,000	342	91,200	1898
484,000	4,123,000	39,000	3,130,000	0	0	153,000	329	88,700	1899
1,372,000	4,276,000	55,000	4,745,000	305,000	0	0	342	145,300	1900
1,534,000	4,276,000	54,000	4,670,000	810,000	0	0	337	142,000	1901
1,268,000	4,276,000	61,000	4,949,000	1,682,000	339,000	0	359	161,600	1902
2,432,000	4,276,000	54,000	5,722,000	1,149,000	24,000	0	345	181,000	1903
1,872,000	4,276,000	65,000	5,152,000	3,170,000	841,000	0	370	172,600	1904
2,462,000	4,276,000	59,000	5,908,000	1,550,000	91,000	0	359	193,300	1905
1,206,000	4,276,000	69,000	4,798,000	1,100,000	306,000	0	377	163,700	1906
2,309,000	4,276,000	65,000	5,989,000	2,468,000	352,000	0	366	199,700	1907
1,795,000	4,276,000	58,000	4,919,000	553,000	0	0	352	155,900	1908
1,155,000	4,276,000	59,000	5,648,000	3,524,000	94,000	0	363	186,400	1909
2,216,000	4,276,000	55,000	5,369,000	708,000	217,000	0	347	170,100	1910
1,215,000	4,276,000	63,000	4,952,000	481,000	144,000	0	363	163,400	1911
1,447,000	4,276,000	61,000	4,032,000	0	83,000	0	360	130,200	1912
1,709,000	4,276,000	58,000	4,533,000	10,000	52,000	0	352	143,600	1913
1,611,000	4,276,000	65,000	5,761,000	2,214,000	498,000	0	369	192,900	1914
1,631,000	4,276,000	66,000	5,390,000	1,896,000	1,027,000	0	372	181,900	1915
2,138,000	4,276,000	59,000	5,790,000	1,598,000	37,000	0	355	187,200	1916
1,321,000	4,276,000	59,000	4,124,000	0	236,000	0	348	129,700	1917
1,132,000	4,276,000	50,000	3,158,000	0	0	0	354	96,400	1918
668,000	4,276,000	54,000	4,665,000	48,000	35,000	0	332	142,900	1919
719,000	3,121,000	24,000	1,979,000	0	0	1,155,000	315	53,400	1920
2,029,000	4,276,000	56,000	5,608,000	1,092,000	0	0	348	173,700	1921
1,059,000	4,276,000	56,000	3,801,000	0	0	0	342	116,700	1922
1,226,000	4,101,000	43,000	3,134,000	0	0	175,000	341	91,100	1923
376,000	2,136,000	13,000	1,072,000	0	0	2,140,000	283	25,600	1924
658,000	4,276,000	54,000	4,318,000	152,000	180,000	0	352	133,900	1925
	124,570,000	1,641,000	136,982,000	26,574,000	5,642,000	3,710,000			Total
	4,152,000	55,000	4,566,000	886,000	188,000	124,000	352.9	145,600	Average

TABLE 3. KENNETT RESER
COMPARISON OF WATER YIELD
FOR
TWO METHODS OF

Yearly Summary of Computations
(For corresponding monthly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1896	8,306,000	1,860,000	4,276,000	65,000	1,767,000	1,472,000	0
1897	6,052,000	2,586,000	4,276,000	59,000	2,413,000	482,000	0
1898	3,308,000	1,408,000	4,189,000	43,000	0	0	87,000
1899	5,050,000	484,000	4,123,000	39,000	0	0	153,000
1900	5,720,000	1,372,000	4,276,000	55,000	1,053,000	174,000	0
1901	5,724,000	1,534,000	4,276,000	54,000	1,635,000	25,000	0
1902	8,685,000	1,268,000	4,276,000	61,000	2,507,000	677,000	0
1903	6,848,000	2,432,000	4,276,000	54,000	2,773,000	305,000	0
1904	10,378,000	1,872,000	4,276,000	65,000	4,264,000	1,183,000	0
1905	6,823,000	2,462,000	4,276,000	59,000	3,278,000	466,000	0
1906	7,981,000	1,206,000	4,276,000	69,000	1,887,000	646,000	0
1907	8,877,000	2,309,000	4,276,000	65,000	4,385,000	665,000	0
1908	5,355,000	1,795,000	4,276,000	58,000	1,401,000	260,000	0
1909	10,871,000	1,155,000	4,276,000	59,000	5,001,000	474,000	0
1910	5,801,000	2,216,000	4,276,000	55,000	1,586,000	885,000	0
1911	6,383,000	1,215,000	4,276,000	63,000	1,357,000	455,000	0
1912	4,935,000	1,447,000	4,276,000	61,000	0	336,000	0
1913	5,017,000	1,709,000	4,276,000	58,000	172,000	609,000	0
1914	9,085,000	1,611,000	4,276,000	65,000	3,843,000	881,000	0
1915	9,454,000	1,631,000	4,276,000	66,000	3,165,000	1,440,000	0
1916	7,127,000	2,138,000	4,276,000	59,000	3,223,000	386,000	0
1917	4,705 000	1,321,000	4,276,000	59,000	0	559,000	0
1918	3,862,000	1,132,000	4,276,000	50,000	0	0	0
1919	5,306,000	668,000	4,276,000	54,000	591,000	334,000	0
1920	4,455,000	719,000	3,121,000	24,000	0	0	1,155,000
1921	6,255.000	2,029,000	4,276,000	56,000	2,682,000	211,000	0
1922	4,504,000	1,059,000	4,276,000	56,000	0	5,000	0
1923	3,294,000	1,226,000	4,101,000	43,000	0	0	175,000
1924	2.431,000	376,000	2,136,000	13,000	0	0	2,140,000
1925	5,420,000	658,000	4,276,000	54,000	526,000	487,000	0
Total	188,012,000		124,570,000	1,641,000	49,509,000	13,417,000	3,710,000
Average	6,267,000		4,152,000	55,000	1,650,000	447,000	124,000

VOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 3a, page 250.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year
1,860,000	4,276,000	65,000	2,760,000	579,000	0	1896
2,486,000	4,276,000	59,000	2,747,000	48,000	0	1897
1,408,000	4,184,000	43,000	5,000	0	92,000	1898
484,000	4,123,000	39,000	0	0	153,000	1899
1,372,000	4,276,000	47,000	1,506,000	0	0	1900
1,263,000	4,268,000	44,000	1,727,000	0	8,000	1901
948,000	4,276,000	61,000	2,705,000	159,000	0	1902
2,432,000	4,276,000	53,000	3,206,000	0	0	1903
1,745,000	4,276,000	65,000	4,634,000	686,000	0	1904
2,462,000	4,276,000	57,000	3,862,000	0	0	1905
1,090,000	4,276,000	69,000	2,253,000	164,000	0	1906
2,309,000	4,276,000	65,000	4,792,000	258,000	0	1907
1,795,000	4,276,000	54,000	1,867,000	0	0	1908
953,000	4,276,000	59,000	5,331,000	0	0	1909
2,158,000	4,276,000	53,000	2,556,000	0	0	1910
1,074,000	4,276,000	63,000	1,634,000	37,000	0	1911
1,447,000	4,276,000	59,000	511,000	0	0	1912
1,536,000	4,276,000	55,000	734,000	0	0	1913
1,488,000	4,276,000	65,000	4,337,000	264,000	0	1914
1,631,000	4,276,000	66,000	3,894,000	711,000	0	1915
2,138,000	4,276,000	55,000	3,735,000	0	0	1916
1,199,000	4,276,000	59,000	323,000	114,000	0	1917
1,132,000	4,248,000	45,000	110,000	0	28,000	1918
591,000	4,276,000	51,000	948,000	0	0	1919
622,000	3,026,000	22,000	0	0	1,250,000	1920
2,029,000	4,276,000	51,000	3,119,000	0	0	1921
838,000	4,276,000	53,000	2,000	0	0	1922
1,011,000	3,891,000	38,000	0	0	385,000	1923
376,000	2,136,000	13,000	0	0	2,140,000	1924
658,000	4,276,000	54,000	959,000	54,000	0	1925
	124,224,000	1,582,000	60,257,000	3,074,000	4,056,000	Total
	4,141,000	53,000	2,009,000	102,000	135,000	Average

TABLE 4. KENNETT RESER

COMPARISON OF WATER AND POWER YIELD, OPERATING PRIMARILY

TWO METHODS OF

Yearly Summary of Computations

(For corresponding monthly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reserve space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of year in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1896	8,306,000	2,256,000	3,225,000	1,701,000	78,000	1,640,000	1,323,000	398	113,000	59,700	172,700
1897	6,052,000	2,595,000	3,227,000	1,552,000	78,000	1,175,000	358,000	396	113,400	54,300	167,700
1898	3,308,000	2,257,000	3,248,000	21,000	75,000	0	0	392	113,400	700	114,100
1899	5,050,000	2,221,000	3,209,000	994,000	78,000	388,000	14,000	399	113,400	35,000	148,400
1900	5,720,000	2,588,000	3,214,000	1,238,000	78,000	1,228,000	21,000	398	113,400	42,900	156,300
1901	5,724,000	2,529,000	3,221,000	1,174,000	78,000	1,402,000	0	397	113,400	40,400	153,800
1902	8,685,000	2,378,000	3,214,000	1,569,000	78,000	2,936,000	614,000	398	113,400	55,300	168,700
1903	6,848,000	2,652,000	3,210,000	1,647,000	78,000	1,834,000	130,000	399	113,400	57,800	171,200
1904	10,378,000	2,601,000	3,238,000	2,449,000	78,000	3,592,000	1,201,000	395	113,000	85,100	198,100
1905	6,823,000	2,421,000	3,217,000	1,504,000	78,000	1,903,000	285,000	397	113,400	53,100	166,500
1906	7,981,000	2,257,000	3,224,000	1,849,000	78,000	1,780,000	839,000	397	113,400	65,100	178,500
1907	8,877,000	2,468,000	3,230,000	2,042,000	78,000	3,044,000	605,000	395	113,400	71,400	184,800
1908	5,355,000	2,346,000	3,226,000	1,146,000	78,000	930,000	64,000	398	113,000	40,200	153,200
1909	10,871,000	2,257,000	3,217,000	2,099,000	78,000	4,785,000	312,000	397	113,400	73,600	187,000
1910	5,801,000	2,637,000	3,210,000	1,443,000	78,000	1,036,000	414,000	399	113,400	50,800	164,200
1911	6,383,000	2,257,000	3,228,000	1,443,000	78,000	1,217,000	425,000	396	113,400	50,800	164,200
1912	4,935,000	2,249,000	3,211,000	1,333,000	78,000	0	305,000	398	113,000	46,900	159,900
1913	5,017,000	2,257,000	3,216,000	1,093,000	78,000	137,000	197,000	398	113,400	38,500	151,900
1914	9,085,000	2,553,000	3,221,000	1,914,000	78,000	3,358,000	810,000	397	113,400	67,400	180,800
1915	9,454,000	2,257,000	3,224,000	1,964,000	78,000	2,509,000	1,464,000	396	113,400	69,000	182,400
1916	7,127,000	2,472,000	3,236,000	1,704,000	78,000	2,149,900	175,000	396	113,000	59,500	172,500
1917	4,705,000	2,257,000	3,220,000	770,000	78,000	178,000	459,000	397	113,400	27,400	140,800
1918	3,862,000	2,257,000	3,222,000	462,000	78,000	0	100,000	396	113,400	16,300	129,700
1919	5,306,000	2,257,000	3,223,000	1,020,000	78,000	919,000	139,000	396	113,400	36,000	149,400
1920	4,455,000	2,184,000	3,374,000	270,000	66,000	202,000	0	375	113,000	9,400	122,400
1921	6,255,000	2,727,000	3,218,000	1,391,000	78,000	1,936,000	36,000	397	113,400	48,900	162,300
1922	4,504,000	2,323,000	3,215,000	832,000	78,000	136,000	238,000	398	113,400	29,400	142,800
1923	3,294,000	2,328,000	3,223,000	133,000	78,000	0	0	398	113,400	4,600	118,000
1924	2,431,000	2,188,000	3,759,000	0	53,000	0	0	339	115,000	0	113,000
1925	5,420,000	807,000	3,361,000	337,000	78,000	0	211,000	381	113,400	12,100	125,500
Total	188,012,000		97,481,000	37,094,000	2,300,000	40,414,000	10,739,000				
Average	6,267,000		3,249,000	1,236,000	77,000	1,347,000	358,000	393.8	113,400	43,400	156,800

*Total primary power production in February of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

FOR POWER GENERATION WITH INCIDENTAL IRRIGATION FOR FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 4a, page 266.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of year in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year
	Primary	Secondary					*Primary	Secondary	Total	
2,075,000	3,149,000	2,102,000	76,000	1,800,000	768,000	392	109,100	73,000	182,100	1896
2,486,000	3,149,000	1,933,000	75,000	1,306,000	0	391	109,400	67,100	176,500	1897
2,075,000	3,190,000	46,000	72,000	0	0	384	109,400	1,500	110,900	1898
2,075,000	3,149,000	887,000	73,000	541,000	0	390	109,400	30,400	139,800	1899
2,475,000	3,146,000	1,373,000	74,000	1,222,000	0	391	109,400	47,100	156,500	1900
2,380,000	3,154,000	1,270,000	73,000	1,356,000	0	389	109,400	43,400	152,800	1901
2,251,000	3,143,000	1,853,000	75,000	3,194,000	185,000	391	109,400	64,500	173,900	1902
2,486,000	3,140,000	1,567,000	74,000	2,089,000	0	392	109,400	54,100	163,500	1903
2,464,000	3,155,000	2,679,000	77,000	3,930,000	764,000	391	109,100	92,300	201,400	1904
2,237,000	3,157,000	1,525,000	74,000	2,229,000	0	390	109,400	52,800	162,200	1905
2,075,000	3,144,000	2,131,000	77,000	1,914,000	465,000	391	109,400	74,100	183,500	1906
2,325,000	3,147,000	2,264,000	76,000	3,307,000	233,000	391	109,400	78,500	187,900	1907
2,175,000	3,164,000	1,339,000	74,000	878,000	0	390	109,100	46,200	155,300	1908
2,075,000	3,153,000	2,202,000	75,000	5,055,000	0	390	109,400	76,100	185,500	1909
2,461,000	3,151,000	1,575,000	74,000	1,387,000	0	390	109,400	54,100	163,500	1910
2,075,000	3,157,000	1,699,000	75,000	1,378,000	74,000	390	109,400	59,300	168,700	1911
2,075,000	3,161,000	1,577,000	75,000	120,000	0	390	109,100	54,500	163,600	1912
2,077,000	3,152,000	1,388,000	74,000	91,000	0	390	109,400	48,000	157,400	1913
2,389,000	3,147,000	2,209,000	76,000	3,695,000	272,000	390	109,400	76,500	185,900	1914
2,075,000	3,147,000	2,087,000	76,000	3,042,000	834,000	391	109,400	72,400	181,800	1915
2,343,000	3,164,000	1,695,000	74,000	2,462,000	0	389	109,100	58,300	167,400	1916
2,075,000	3,158,000	1,188,000	75,000	227,000	57,000	389	109,400	41,700	151,100	1917
2,075,000	3,168,000	409,000	74,900	211,000	0	387	109,400	14,000	123,400	1918
2,075,000	3,156,000	835,000	74,000	1,245,000	0	389	109,400	29,000	138,400	1919
2,071,000	3,230,000	192,000	66,000	492,000	0	371	109,100	6,500	115,600	1920
2,486,000	3,154,000	1,309,000	74,000	2,043,000	0	390	109,400	45,100	154,500	1921
2,161,000	3,159,000	981,000	74,000	296,000	0	389	109,400	33,900	143,300	1922
2,155,000	3,152,000	71,000	74,000	77,000	0	390	109,400	2,500	111,900	1923
2,075,000	3,692,000	0	53,000	0	0	334	109,100	0	109,100	1924
761,000	3,290,000	594,000	75,000	147,000	0	375	109,400	20,900	130,300	1925
	95,438,000	40,980,000	2,208,000	45,734,000	3,652,000					Total
	3,181,000	1,366,000	74,000	1,524,000	122,000	386.9	109,400	47,300	156,700	Average

TABLE 5. KENNETT RESER
SUMMARY OF POWER
BOTH
WITH AND WITHOUT
Summary of Tables
(For corresponding monthly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1896	113,000	69,500	182,500	113,000	59,700	172,700	109,100	73,000	182,100
1897	113,400	59,100	172,500	113,400	54,300	167,700	109,400	67,100	176,500
1898	113,400	700	114,100	113,400	700	114,100	109,400	1,500	110,900
1899	113,400	34,900	148,300	113,400	35,000	148,400	109,400	30,400	139,800
1900	113,400	54,200	167,600	113,400	42,900	156,300	109,400	47 100	156 500
1901	113,400	46,300	159,700	113,400	40,400	153,800	109,400	43,400	152,800
1902	113,400	58,900	172,300	113,400	55,300	168,700	109,400	64,500	173,900
1903	113,400	58,200	171,600	113,400	57,800	171,200	109,400	54,100	163,500
1904	113,000	85,600	198,600	113,000	85,100	198,100	109,100	92,300	201,400
1905	113,400	51,000	164,400	113,400	53,100	166,500	109,400	52,800	162,200
1906	113,400	63,900	177,300	113,400	65,100	178 500	109,400	74,100	183 500
1907	113,400	64,500	177,900	113,400	71,400	184,800	109,400	78,500	187,900
1908	113,000	49,500	162,500	113,000	40,200	153,200	109,100	46,200	155,300
1909	113,400	74,800	188,200	113,400	73,600	187,000	109,400	76,100	185,500
1910	113,400	52,300	165,700	113,400	50,800	164,200	109,400	54,100	163,500
1911	113,400	51,500	164,900	113,400	50,800	164,200	109,400	59,300	168,700
1912	113,000	46,900	159,900	113,000	46,900	159,900	109,100	54,500	163,600
1913	113,400	42,100	155,500	113,400	38,500	151,900	109,400	48,000	157,400
1914	113,400	68,000	181,400	113,400	67,400	180,800	109,400	76.500	185,900
1915	113,400	65,500	178,900	113,400	69,000	182,400	109,400	72,400	181,800
1916	113,000	56,300	169,300	113,000	59,500	172,500	109,100	58,300	167,400
1917	113,400	32,000	145,400	113,400	27,400	140,800	109,400	41,700	151,100
1918	113,400	16,300	129,700	113,400	16,300	129,700	109,400	14,000	123,400
1919	113,400	32,400	145,800	113,400	36,000	149,400	109,400	29,000	138,400
1920	113,000	9,400	122,400	113,000	9,400	122,400	109,100	6,500	115,600
1921	113,400	51,600	165,000	113,400	48,900	162,300	109,400	45,100	154,500
1922	113,400	32,300	145,700	113,400	29,400	142,800	109,400	33,900	143,300
1923	113,400	4,600	118,000	113,400	4,600	118,000	109,400	2,500	111,900
1924	113,000	0	113,000	113,000	0	113,000	109,100	0	109,100
1925	113,400	12,100	125,500	113,400	12,100	125,500	109,400	20,900	130,300
Average	113,400	44,800	158,200	113,400	43,400	156,800	109,400	47,300	156,700

*Total primary power production of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

YIELD BY YEARS

FLOOD CONTROL.

1, 2, and 4.

mary, see Table 5a, page 282.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 ac.-ft.
(Deficiency in supply one year in ten. No deduction for downstream prior rights)
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year
Primary	Secondary	Total	Primary	Secondary	Total	
0	178,400	178,400	0	164,000	164,000	1896
0	180,800	180,800	0	181,900	181,900	1897
0	91,200	91,200	0	91,200	91,200	1898
0	88,700	88,700	0	88,700	88,700	1899
0	145,500	145,500	0	145,300	145,300	1900
0	144,900	144,900	0	142,000	142,000	1901
0	166,300	166,300	0	161,600	161,600	1902
0	176,700	176,700	0	181,000	181,000	1903
0	170,200	170,200	0	172,600	172,600	1904
0	188,300	188,300	0	193,300	193,300	1905
0	161,500	161,500	0	163,700	163,700	1906
0	186,200	186,200	0	199,700	199,700	1907
0	166,000	166,000	0	155,900	155,900	1908
0	190,400	190,400	0	186,400	186,400	1909
0	171,100	171,100	0	170,100	170,100	1910
0	155,500	155,500	0	163,400	163,400	1911
0	130,200	130,200	0	130,200	130,200	1912
0	143,800	143,800	0	143,600	143,600	1913
0	192,800	192,800	0	192,900	192,900	1914
0	181,100	181,100	0	181,900	181,900	1915
0	183,300	183,300	0	187,200	187,200	1916
0	129,700	129,700	0	129,700	129,700	1917
0	96,400	96,400	0	96,400	96,400	1918
0	138,500	138,500	0	142,900	142,900	1919
0	53,400	53,400	0	53,400	53,400	1920
0	176,800	176,800	0	178,700	178,700	1921
0	116,700	116,700	0	116,700	116,700	1922
0	91,100	91,100	0	91,100	91,100	1923
0	25,600	25,600	0	25,600	25,600	1924
0	135,500	135,500	0	133,900	133,900	1925
0	145,300	145,300	0	145,600	145,600	Average

Pardee Reservoir on Mokelumne River.

The East Bay Municipal Utility District proposes to construct the Pardee reservoir of 222,000 acre-feet capacity at the site on the Mokelumne River known by many as the Lancha Plana. It is estimated that this reservoir will yield 200 million gallons per day equalized for municipal supply. The dam would be 345 feet high. A power plant of 15,000 k.w. capacity at its base would generate electricity with the water passing by the dam. The effect of including in the plans of the East Bay Municipal Utility District a flood control feature similar to that devised for the reservoirs of the "Coordinated Plan" was investigated by the Division of Engineering and Irrigation under agreement with the district of date February 5, 1926.

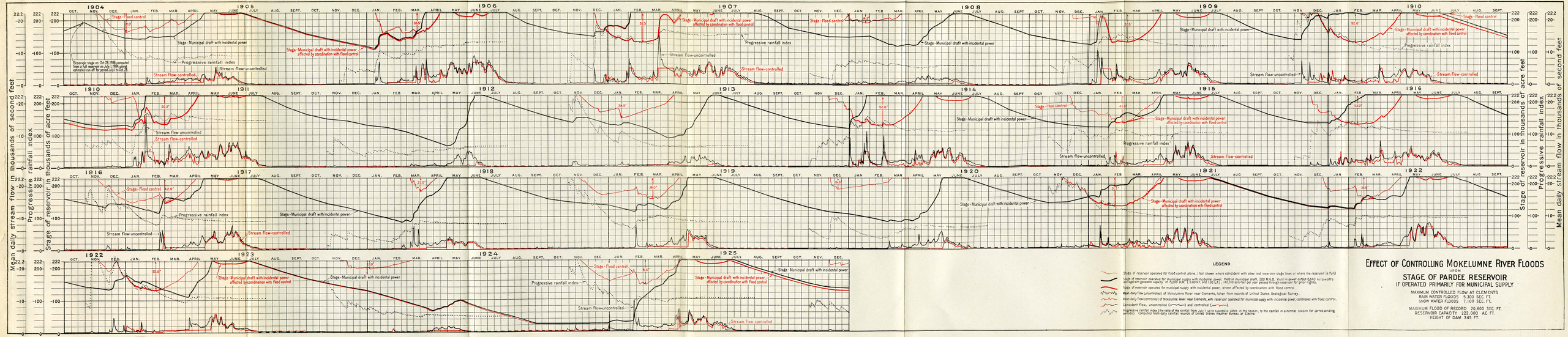
The size of floods to be controlled on the Mokelumne River is indicated by the largest ones in the stream flow records. The largest rain-water flood in the twenty-one years of measured flow occurred on January 30, 1911, with a crest discharge of 20,600* second-feet. The largest snow-water flood occurred on June 12, 1906, with a discharge of 8740 second-feet. The crest discharge of these floods could be limited by the Pardee reservoir through the use of a diagram like that on Plate XIX, "Reservoir Operating Diagram for Controlling Floods on Mokelumne River" (p. 80), to 5300 second-feet for rain-water floods and to 7100 second-feet for snow-water floods. This reduction in flood flows could be obtained by the use at times of a maximum reserve for flood control of 92,000 acre-feet, about two-fifths the total capacity of the reservoir.

The effect of including this flood control feature upon reservoir stage and the yield of water and power from the Pardee reservoir is derived from a comparison of two sets of computations of the yield, one with and the other without flood control. As in studying the effect of the inclusion of a flood control feature upon the yield of the Kennett reservoir, both sets of computations were carried through the entire period of measured flow on a daily basis instead of on the usual monthly basis in order to make the set without flood control exactly comparable to the one with flood control included. The latter had to be carried through on a daily basis to accommodate the requirements of the reservoir operating diagram which requires a daily adjustment of reservoir level during the flood season. The stream flow data used are those published in the Water Supply Papers of the United States Geological Survey for the Clements gaging station together with those in preparation for publication. No deduction was made for the 59 square miles of drainage area between Clements and the dam. The assumptions employed in these computations are listed on page 298.

The effect of including this flood control feature upon the reservoir stage is delineated upon Plate XXIV, "Effect of Controlling Mokel-

* Water Supply Paper No. 551 of the United States Geological Survey, recently published, places the maximum discharge of the Mokelumne River at Clements at 25,500 second-feet. This is obtained by applying the rating curve of the 1911 flood to the gage heights of 1907. The crest discharge of the 1907 flood has been published as 17,000 second-feet in former publications including Water Supply Paper No. 299 in which are printed the daily discharges of the 1907 flood. The figures contained in Water Supply Paper No. 299 have been used in preparing this volume. Should the daily discharges of the 1907 flood be revised by application of the 1907 gage heights to the 1911 rating curve, the increase in their values would be so substantial as to require a complete revision of the analyses of floods on the Mokelumne River contained in this volume in order to make the analyses harmonize with the increased discharge values.

ALEXANDER PLATE XXII



LEGEND

Stage of reservoir operated for flood control alone. (Not shown where coincident with other red reservoir stage lines or where no reservoir is built)

Stage of reservoir operated for municipal supply with incidental power. Yield in municipal draft, 330 M.G.D. Yield in power output 8,640 kilowatts (average)with generator capacity of 15,000 K.W. (3,840 P.P. and 1,100 S.P.). 140,000 acre-feet per year passed through reservoir for prior rights.

Stage of reservoir operated for municipal supply with incidental power, where affected by coordination with flood control

Mean daily flow(uncontrolled) of Mokelumne River near Clements, taken from records of United States Geological Survey.

Mean daily flow(controlled) of Mokelumne River near Clements, with reservoir operated for municipal supply with incidental power, coordinated with flood control.

Coincident flow, uncontrolled (—•—•—) and controlled (———).

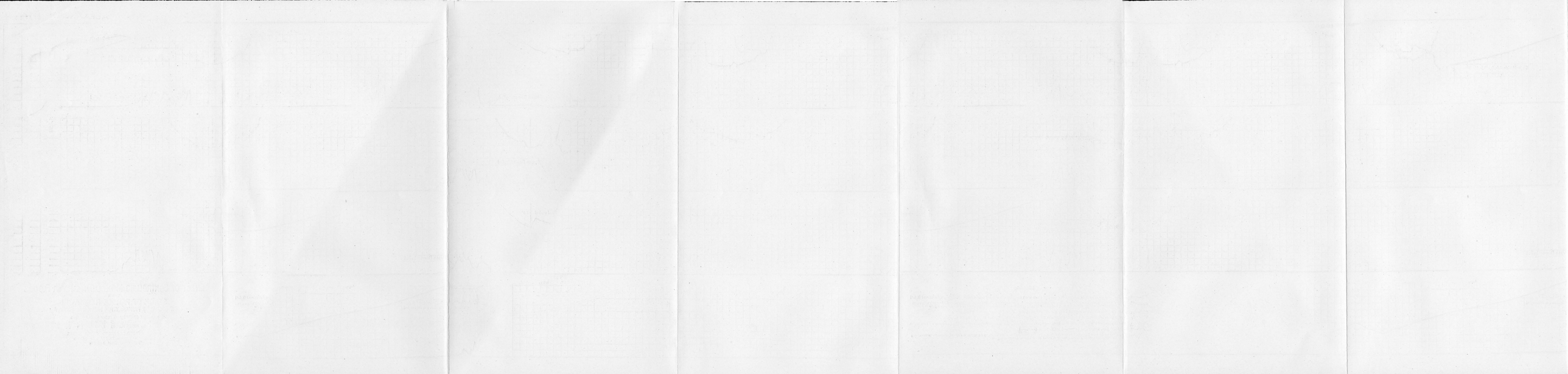
Progressive rainfall index (the ratio of the rainfall from July 1 up to successive dates in the season, to the rainfall in a normal season for corresponding periods). Computed from daily rainfall records of United States Weather Bureau at Electra

EFFECT OF CONTROLLING MOKELUMNE RIVER FLOODS UPON STAGE OF PARDEE RESERVOIR IF OPERATED PRIMARILY FOR MUNICIPAL SUPPLY

MAXIMUM CONTROLLED FLOW AT CLEMENTS
RAIN WATER FLOODS 5,300 SEC. FT.
SNOW WATER FLOODS 7,100 SEC. FT.

MAXIMUM FLOOD OF RECORD 20,600 SEC. FT.
RESERVOIR CAPACITY 222,000 AC. FT.
HEIGHT OF DAM 345 FT.

52411—Pages 119-120



umne River Floods upon Stage of Pardee Reservoir.'' It is assumed in preparing this plate that the Pardee reservoir was constructed some time prior to 1904, the opening year of continuous stream flow measurements on the Mokelumne River, and operated both with and without flood control through the succeeding years for a municipal supply of 200 million gallons per day together with incidental power development as proposed by the East Bay Municipal Utility District. The reservoir stage for every day of the 21 years from 1905 to 1926 is indicated by lines extending across the plate in several rows. Their vertical position, read on the reservoir stage scale, shows the number of acre-feet of water in storage at all times. On this scale, the space between parallel guide lines represents 20,000 acre-feet of reservoir capacity. The top guide line of each row represents a full reservoir and the bottom one an empty reservoir.

The heavy black line extending across each row indicates the stage were 200 million gallons per day drawn from the reservoir and 140,000 acre-feet per year passed by the dam for prior rights. The heavy red line indicates the departures from this stage by reason of the introduction of the flood control feature. The light red line indicates the stage were the reservoir operated for flood control alone in accordance with the diagram. Red figures translate into feet of depth the greatest draw down from a full reservoir required by flood control during each season. A light black line in each row below the reservoir stage lines indicates on a special scale superimposed on the reservoir stage scale, the undisturbed daily flow in the Mokelumne River at Clements. The light red line close at hand shows the flow below the dam as controlled by the coordinate operation of the reservoir for flood control and conservation. A black dotted line shows throughout the flood season the daily value of the progressive rainfall index used in entering the reservoir operating diagram to obtain the flood control reserve on each day.

In 8 out of the 21 seasons displayed on the plate, flood control requires a maximum depth of empty space from 50 to 52.5 feet below the full reservoir level. In the other 13 seasons, the maximum depths required range from 0 to 50 feet. In one-third of the seasons, the water level due to conservation operations is lower than required for flood control. The average actual depression of water level due to flood control is 10 feet, 3.4 per cent of the average depth of water in the reservoir at the dam. The reservoir level is depressed for flood control more than one foot, about one-quarter of the entire elapsed time of the analysis.

The water yield of the reservoir is practically* the same both with and without the inclusion of the flood control feature. A continuous draft of 200 million gallons per day can be sustained through the entire 21 years either with or without flood control except in the fall of 1924 when there is a shortage of 19.9 billion gallons with and 19.1 billion gallons without flood control, a difference* of 1.1 per cent of the annual supply.

* It appears probable that the yield of water and power both with and without flood control would be the same were indices of snow-on-the-ground used instead of rainfall indices in constructing and applying that part of the reservoir operating diagram pertaining to snow-water floods (see page 213).

The average incidental power generated is 6640 kilowatts without flood control and 6510 kilowatts with flood control, a difference of 2 per cent. In both instances the entire amount is secondary power.

If flood control were attained by holding the maximum reserve empty throughout the flood season the inclusion of flood control would affect the yield of water and power a little more than if attained by use of the reservoir operating diagram. In the computations for this comparison, 92,000 acre-feet of capacity are held empty each year until April 21st, the close of the rain-water flood season. The reserve is then reduced to 13,000 acre-feet. This is held empty from May 11th to July 5th, the season of snow-water floods. Under this plan of operation, flood control increases the shortage in water yield in 1924, the only year of deficient supply, from 19.1 to 24.6 billion gallons, an increase of 2.8 per cent of the annual supply. A full supply is obtained in all of the other 20 years analyzed. The average power output is reduced 2.9 per cent.

The following tables present yearly summaries of all the computations of yield of the reservoir. Tables of monthly summaries, because of their volume, are placed in a separate chapter.

PARDEE RESERVOIR ON MOKELUMNE RIVER

Table of Yearly Summaries of Water and Power Yield Computed on a Daily Basis

Showing the effect of inclusion of the flood control feature.

(See Chapter VIII for corresponding monthly summaries.)

TABLE 6—With and without flood control by reservoir operating diagram.

TABLE 7—Yield compared for two methods of flood control.

TABLE 8—Summary of Tables 6 and 7.

TABLE 6. PARDEE RESERVOIR
WATER AND
BOTH
WITH AND WITHOUT FLOOD CONTROL
Yearly Summary of Computations
For corresponding monthly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of year in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1905	578,060	145,860	224,040	241,480	5,860	135,880	0	303	6,320
1906	1,415,400	116,660	224,040	325,760	6,400	794,280	0	307	8,650
1907	1,642,700	181,580	224,040	398,680	6,150	1,046,510	0	313	10,820
1908	455,340	148,900	224,650	236,970	5,820	10,770	0	299	6,020
1909	1,278,230	126,030	224,040	346,350	6,160	618,790	0	315	9,480
1910	788,060	208,920	224,040	279,830	5,740	355,440	0	314	7,670
1911	1,515,830	131,930	224,040	315,670	6,210	970,250	0	311	8,630
1912	410,540	131,590	224,650	169,020	5,340	10,360	0	279	3,870
1913	405,950	132,760	224,040	183,270	5,820	3,280	0	286	4,370
1914	1,075,890	122,300	224,040	302,610	6,240	541,320	0	314	8,280
1915	829 400	123,980	224,040	248,280	6,210	336,460	0	303	6,580
1916	1,049,320	138,390	224,650	303,750	6,210	508,860	0	308	8,240
1917	828,860	144,240	224,040	275,060	6,260	352,930	0	302	7,190
1918	546,170	114,810	224,040	179,270	6,220	116,680	0	293	4,680
1919	573,130	134,770	224,040	196,310	5,720	171,570	0	294	4,970
1920	506,310	110,260	224,650	159,980	5,870	64,340	0	283	3,930
1921	823,280	161,730	224,040	282,720	5,890	345,540	0	313	7,660
1922	974,010	126,820	224,040	243,190	6,300	450,540	0	301	6,390
1923	648,880	176,760	224,040	313,070	5,860	152,490	0	300	7,930
1924	206,650	130,180	166,010	140,000	1,760	0	58,640	208	2,590
1925	802,990	29,060	224,040	190,680	6,610	277,080	0	288	5,100
Total	17,355,000		4,649,250	5,331,950	122,650	7,263,370	58,640		
Average	826,430		221,390	253,900	5,840	345,870	2,790	296	6,640

ON MOKELUMNE RIVER.

POWER YIELD

BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary see Table 6a, page 300.)

Yield in municipal supply 200 million gallons daily.

Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of year in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year
145,860	224,040	241,160	5,860	111,840	26,380	0	302	6,300	1905
114,640	224,040	330,460	6,400	571,150	232,320	0	305	8,680	1906
165,670	224,040	415,450	6,150	521,260	492,570	0	305	10,820	1907
148,900	224,650	236,970	5,820	0	10,770	0	299	6,020	1908
126,030	224,040	345,820	6,160	552,980	114,450	0	304	9,010	1909
160,810	224,040	269,630	5,740	224,410	103,660	0	298	6,900	1910
121,390	224,040	339,400	6,210	730,430	205,550	0	302	8,850	1911
131,590	224,650	169,020	5,340	0	10,360	0	279	3,870	1912
132,760	224,040	183,270	5,820	0	3,280	0	286	4,370	1913
122,300	224,040	328,090	6,240	449,110	66,730	0	302	8,450	1914
123,980	224,040	230,140	6,210	333,570	21,030	0	302	6,080	1915
138,390	224,650	339,580	6,210	346,920	126,110	0	298	8,690	1916
144,240	224,040	259,550	6,260	263,350	105,090	0	302	6,790	1917
114,810	224,040	179,270	6,220	0	116,680	0	293	4,680	1918
134,770	224,040	196,310	5,720	0	171,570	0	294	4,970	1919
110,260	224,650	159,980	5,870	0	64,340	0	283	3,930	1920
161,730	224,040	280,900	5,890	293,730	55,850	0	302	7,170	1921
124,600	224,040	235,780	6,300	394,730	61,000	0	300	6,220	1922
176,760	224,040	288,000	5,860	169,370	10,520	0	297	7,250	1923
127,850	163,680	140,000	1,760	0	0	60,970	206	2,570	1924
29,060	224,040	189,850	6,610	182,850	99,770	0	286	5,040	1925
	4,646,920	5,358,630	122,650	5,145,700	2,098,030	60,970			Total
	221,280	255,170	5,840	245,030	99,910	2,900	292	6,510	Average

TABLE 7. PARDEE RESER
COMPARISON OF WATER
FOR
TWO METHODS OF

Yearly Summary of Computations
(For corresponding monthly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of year in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1905	578,060	145,860	224,040	241,160	5,860	111,840	26,380	0	302	6,300
1906	1,415,400	114,640	224,040	330,460	6,400	571,150	232,320	0	305	8,680
1907	1,642,700	165,670	224,040	415,450	6,150	521,260	492,570	0	305	10,820
1908	455,340	148,900	224,650	236,970	5,820	0	10,770	0	299	6,020
1909	1,278,230	126,030	224,040	345,820	6,160	552,980	114,450	0	304	9,010
1910	788,060	160,810	224,040	269,630	5,740	224,410	103,660	0	298	6,900
1911	1,515,830	121,390	224,040	339,400	6,210	730,430	205,550	0	302	8,850
1912	410,540	131,590	224,650	169,020	5,340	0	10,360	0	279	3,870
1913	405,950	132,760	224,040	183,270	5,820	0	3,280	0	286	4,370
1914	1,075,890	122,300	224,040	328,090	6,240	449,110	66,730	0	302	8,450
1915	829,400	123,980	224,040	230,140	6,210	333,570	21,030	0	302	6,080
1916	1,049,320	138,390	224,650	339,580	6,210	346,920	126,110	0	298	8,690
1917	828,860	144,240	224 040	259,550	6,260	263,350	105,090	0	302	6,790
1918	546,170	114,810	224,040	179,270	6,220	0	116,680	0	293	4,680
1919	573,130	134,770	224,040	196,310	5,720	0	171,570	0	294	4,970
1920	506,310	110,260	224,650	159,980	5,870	0	64,340	0	283	3,930
1921	823,280	161,730	224,040	280,900	5,890	293,730	55,850	0	302	7,170
1922	974,010	124,600	224,040	235,780	6,300	394,730	61,000	0	300	6,220
1923	648,880	176,760	224,040	288,000	5,860	169,370	10,520	0	297	7,250
1924	206,650	127,850	163,680	140,000	1,760	0	0	60,970	206	2,570
1925	802,990	29,060	224,040	189,850	6,610	182,850	99,770	0	286	5,040
Total	17,355,000		4,646,920	5,358,630	122,650	5,145,700	2,098,030	60,970		
Average	826,430		221,280	255,170	5,840	245,030	99,910	2,900	292	6,510

VOIR ON MOKELUMNE RIVER.

AND POWER YIELD

FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 7a, page 312.)

Yield in municipal supply 200 million gallons daily.

Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft. snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of year in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year
101,560	224,040	234,520	5,860	111,540	0	0	285	5,700	1905
103,660	224,040	352,970	6,400	657,380	148,270	0	295	8,850	1906
130,000	224,040	412,760	6,150	864,760	141,480	0	298	10,560	1907
123,510	224,650	217,880	5,820	17,460	0	0	285	5,220	1908
113,040	224,040	386,170	6,160	617,970	32,030	0	292	9,490	1909
124,900	224,040	290,070	5,740	255,830	18,370	0	290	7,090	1910
118,910	224,040	347,480	6,210	877,030	64,780	0	295	8,750	1911
115,200	224,650	169,220	5,340	17,480	0	0	267	3,700	1912
109,050	224,040	175,860	5,820	0	0	0	273	3,950	1913
109,280	224,040	331,090	6,240	504,940	0	0	294	8,200	1914
118,860	224,040	253,800	6,210	336,770	0	0	293	6,340	1915
127,440	224,650	340,750	6,210	434,230	41,730	0	292	8,450	1916
129,190	224,040	262,890	6,260	350,310	6,030	0	293	6,580	1917
108,520	224,040	189,640	6,220	113,300	0	0	284	4,730	1918
121,490	224,040	193,870	5,720	134,780	38,960	0	286	4,760	1919
97,250	224,650	177,420	5,870	65,620	0	0	274	4,230	1920
130,000	224,040	301,710	5,890	307,810	0	0	292	7,440	1921
113,830	224,040	256,700	6,300	444,980	25,820	0	291	6,420	1922
130,000	224,040	299,750	5,860	136,040	0	0	282	7,010	1923
113,190	149,020	140,000	1,760	0	0	75,630	198	2,450	1924
29,060	224,040	214,330	6,610	248,080	18,280	0	279	5,420	1925
	4,632,260	5,548,880	122,650	6,496,310	535,750	75,630			Total
	220,580	264,230	5,840	309,350	25,510	3,600	283	6,450	Average

TABLE 8. PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY YEARS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6 and 7.

(For corresponding monthly summary, see Table 8a, page 324.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.

Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year	Without flood contro			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1905	224,040	0	6,320	224,040	0	6,300	224,040	0	5,700
1906	224,040	0	8,650	224,040	0	8,680	224,040	0	8,850
1907	224,040	0	10,820	224,040	0	10,820	224,040	0	10,560
1908	224,650	0	6,020	224,650	0	6,020	224,650	0	5,220
1909	224,040	0	9,480	224,040	0	9,010	224,040	0	9,490
1910	224,040	0	7,670	224,040	0	6,900	224,040	0	7,090
1911	224,040	0	8,630	224,040	0	8,850	224,040	0	8,750
1912	224,650	0	3,870	224,650	0	3,870	224,650	0	3,700
1913	224,040	0	4,370	224,040	0	4,370	224,040	0	3,950
1914	224,040	0	8,280	224,040	0	8,450	224,040	0	8,200
1915	224,040	0	6,580	224,040	0	6,080	224,040	0	6,340
1916	224,650	0	8,240	224,650	0	8,690	224,650	0	8,450
1917	224,040	0	7,190	224,040	0	6,790	224,040	0	6,580
1918	224,040	0	4,680	224,040	0	4,680	224,040	0	4,730
1919	224,040	0	4,970	224,040	0	4,970	224,040	0	4,760
1920	224,650	0	3,930	224,650	0	3,930	224,650	0	4,230
1921	224,040	0	7,660	224,040	0	7,170	224,040	0	7,440
1922	224,040	0	6,390	224,040	0	6,220	244,040	0	6,420
1923	224,040	0	7,930	224,040	0	7,250	224,040	0	7,010
1924	166,010	58,640	2,590	163,680	60,970	2,570	149,020	75,630	2,450
1925	224,040	0	5,100	224,040	0	5,040	224,040	0	5,420
Total	4,649,250	58,640		4,646,920	60,970		4,632,260	75,630	
Average	221,390	2,790	6,640	221,280	2,900	6,510	220,580	3,600	6,450

Temperance Flat Reservoir on San Joaquin River.

Among the reservoirs of the "Coordinated Plan,"* for developing the State's waters is one on the San Joaquin River, six miles upstream from Friant. It is proposed that a dam 595 feet high be constructed at this point. This would create a reservoir of 1,071,000 acre-feet capacity, sufficiently large to equalize seven-eighths of the mean annual run-off of the San Joaquin River for irrigation use and generate on an average 62,000 kilowatts of incidental power at a plant erected near the base of the dam. The installed capacity of the plant would be 220,000 k.v.a. Also, large floods would be controlled to about one-

* See Bul. No. 12, "Summary Report on the Water Resources of California and a Coordinated Plan for their Development," Division of Engineering and Irrigation, State Department of Public Works.

quarter of their natural size. A full description of this unit of the "Coordinated Plan," together with estimates of the water and power yield without flood control is contained in Bulletin No. 16, "The Coordinated Plan of Water Development in the San Joaquin Valley." The effect of including the flood control feature of the plan is described in the following pages.

The rule for operating the Temperance Flat Reservoir for flood control has been developed in the previous chapters of this volume. It is expressed on Plate XX, "Reservoir Operating Diagram for Controlling Floods on the San Joaquin River" (p. 84). It would limit rain-water floods, including the maximum of record, to 10,700 second-feet and snow-water floods to 14,200 second-feet. The maximum rain-water flood of record had a mean daily flow of 38,800 second-feet. It occurred on Jan. 31, 1911. The maximum snow-water flood discharged 23,100 second-feet and occurred on June 13, 1911. The reduction in flood flows obtained through the use of this reservoir operating diagram requires a reservation at times of a maximum space of 177,000 acre-feet, one-sixth of the total capacity of the reservoir.

The effect of including this flood control feature upon the reservoir stage and upon the yield of water and power is derived from a comparison of the yield computed both with and without flood control. In order that this might be an exact comparison, both sets of computations are carried out on a daily basis to conform to the requirements of the reservoir operating diagram which calls for daily adjustment of reservoir level during the flood season. The parallel sets of computations are made in exactly the same way except for the exclusion of the flood control feature in one set. They are carried out similarly to the computations of yield described in Bulletin No. 16, except that they are made on a daily instead of the usual monthly basis, include only the 18 years of continuous stream flow record and make no deduction for the 108 square miles of drainage area between the Friant gaging station and the dam site.* The stream flow data used are those published in the Water Supply Papers of the United States Geological Survey for the Friant gaging station together with those in preparation for publication. The assumptions of the computations are listed on page 331.

The effect of inclusion of the flood control feature upon reservoir stage is delineated on Plate XXV, "Effect of Controlling San Joaquin River Floods upon Stage of Temperance Flat Reservoir." Here the reservoir stage is shown day by day from 1908 to 1926, the period of continuous measurement of flow in the San Joaquin River. It is assumed for constructing this plate that the reservoir was in existence in 1907 and operated through the succeeding years as proposed in the "Coordinated Plan," first excluding and then including the flood control feature. The volume of water in storage throughout the 18-year period is shown on each day by the vertical position on the reservoir stage scale of lines extending across the plate in several rows. To the scale of the plate, each space between horizontal guide lines equals 100,000 acre-feet. The top guide line of each row represents a full reservoir and the bottom line an empty reservoir.

* The water and power yield published in Bul. No. 16 is an estimate made on a monthly basis covering the 54-year period 1871–1925. It makes a deduction of 1.5 per cent from the measured flow at Friant for the area between the gaging station and the dam site. For this reason the estimates in Bul. No. 16 are not exactly comparable with the ones contained in this volume.

The reservoir stage operating with the flood control feature excluded is indicated by the heavy black line extending across each row. The departure from this stage caused by the inclusion of the flood control feature is shown by a heavy red line. A light red line indicates the reservoir stage were it operated for flood control alone in accord with the diagram. Red figures translate into feet depth from full reservoir level, the greatest draw down required by flood control in each season. Below the reservoir stage lines in each row is shown in a light black line to a special scale superimposed on the reservoir stage scale, the uncontrolled flow of the river at Friant and in a light red line the controlled flow downstream from the dam when the "Coordinated Plan" with its flood control feature is in operation. A line of black dots shows the daily values of the progressive rainfall index used in entering the reservoir operating diagram to obtain the necessary flood control reserve.

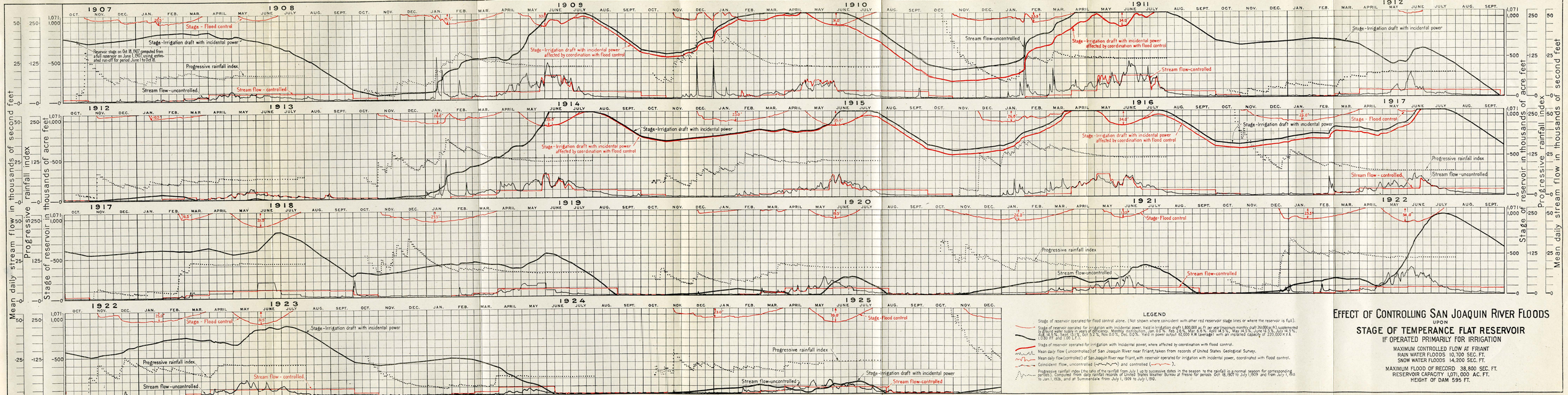
It is observed in reviewing Plate XXV that in 12 of the 18 seasons analyzed, the reservoir stage resulting from operation for conservation is less than that required for flood control. In these seasons the inclusion of the flood control feature does not affect the reservoir stage at all. In the other six seasons at times, the drawdown from a full reservoir level reaches a maximum of 35 feet, 6 per cent of the depth of a full reservoir at the dam. The average actual depression of the water level due to flood control is 17 feet, 3.5 per cent of the average depth of water in the reservoir at the dam. The reservoir level is depressed by reason of the inclusion of the flood control feature, one-quarter of the entire elapsed time of the analyses.

The effect of the inclusion of the flood control feature in the "Coordinated Plan" upon the water and power yield of the Temperance Flat reservoir is shown by the accompanying summary tabulations of the computations of yield with and without flood control carried out on a daily basis in order to accommodate the requirements of the reservoir operating diagram. Monthly and yearly summaries are prepared of these computations. The yearly summaries follow herewith but the monthly summaries, because of their volume, are placed in a separate chapter.

These data show that the inclusion of the flood control feature has no effect at all upon the water yield of the reservoir and very little effect* upon the power generated. With flood control the average power output is 61,400 kilowatts and without flood control 62,000 kilowatts, a difference of 1.0 per cent. All is secondary power in both instances.

If flood control were attained by holding the maximum reserve empty throughout the flood season instead of by use of the reservoir operating diagram, the inclusion of flood control would have a small effect on the water as well as on the power yield. In the computations for this comparison, 133,000 acre-feet of capacity are held empty each year until April 7th, the close of the rain-water flood season. The reserve is then increased to 177,000 acre-feet which is held empty from April 27th to July 16th, the season of snow-water floods. For these conditions, the average yield of irrigation water is reduced 1.0 per cent, the reductions occurring in the seasons of short supply, and the average power output is reduced 6.0 per cent.

* It appears probable that the power yield would be almost identical both with and without flood control were indices of snow-on-the-ground used instead of rainfall indices in constructing and applying that part of the reservoir operating diagram pertaining to snow-water floods (see p. 213).



LEGEND

Stage of reservoir operated for flood control alone. (Not shown where coincident with other red reservoir stage lines or where the reservoir is full).

Stage of reservoir operates for irrigation with incidental power. Yield in irrigation draft 1,800,000 ac ft per year (maximum monthly draft 290,000 ac ft) supplemented by ground water supply in years of deficiency. Monthly distribution, Jan. 0.0 %, Feb. 2.6 %, Mar. 6.6 %, April 14.3 %, May 14.5 %, June 13.5 %, July 14.5 %, Aug. 14.3 %, Sept. 13.1 %, Oct. 5.2 %, Nov. 0.0 %, Dec. 0.0 %. Yield in power output 152,000 K.W. (average) with an installed capacity of 220,000 K.W. (130.97 and 1.00 L.F.).

Stage of reservoir operated for irrigation with incidental power, where affected by coordination with flood control.

Mean daily flow (uncontrolled) of San Joaquin River near Friant, taken from records of United States Geological Survey.

Mean daily flow (controlled) of San Joaquin River near Friant, with reservoir operated for irrigation with incidental power, coordinated with flood control.

Coincident flow, uncontrolled (~~~) and controlled (———).

Progressive rainfall index (the ratio of the rainfall from July 1 up to successive dates in the season to the rainfall in a normal season for corresponding periods). Computed from daily rainfall records of United States Weather Bureau at Fresno for periods Oct. 18, 1907 to July 1, 1909 and from July 1, 1910 to Jan. 1, 1926, and at Summerdale from July 1, 1909 to July 1, 1910.

EFFECT OF CONTROLLING SAN JOAQUIN RIVER FLOODS
UPON
STAGE OF TEMPERANCE FLAT RESERVOIR
IF OPERATED PRIMARILY FOR IRRIGATION

MAXIMUM CONTROLLED FLOW AT FRIANT
RAIN WATER FLOODS 10,700 SEC. FT.
SNOW WATER FLOODS 14,200 SEC. FT.

MAXIMUM FLOOD OF RECORD 38,800 SEC. FT.
RESERVOIR CAPACITY 1,071,000 AC. FT.
HEIGHT OF DAM 595 FT.

TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

Table of Yearly Summaries of Water and Power Yield Computed on a Daily Basis.

Showing the effect of inclusion of the flood control feature of the "Coordinated Plan." (See Chapter VIII for corresponding monthly summaries.)

TABLE 9—With and without flood control by reservoir operating diagram.

TABLE 10—Yield compared for two methods of flood control.

TABLE 11—Summary of Tables 9 and 10.

TABLE 9. TEMPERANCE FLAT RESER
WATER AND
BOTH
WITH AND WITHOUT FLOOD CONTROL
Yearly Summary of Computations
(For corresponding monthly sum

Height of dam 595 feet.

Capacity of reservoir 1,071,000 acre-feet.

Year	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1908	1,115,000	797,100	1,800,000	13,700	1,699,100	0	0	488	73,800
1909	3,136,700	98,400	1,800,000	18,400	1,811,400	568,600	0	510	85,800
1910	1,825,500	836,700	1,800,000	18,500	1,876,600	347,300	0	538	91,100
1911	3,562,200	419,800	1,800,000	20,100	1,831,700	1,416,500	0	556	91,900
1912	1,023,700	713,700	1,686,900	10,200	1,510,300	0	113,100	454	60,900
1913	874,100	40,300	863,300	100	0	0	936,700	0	0
1914	2,905,300	51,000	1,800,000	18,900	1,811,600	361,100	0	514	86,600
1915	1,954,600	764,700	1,800,000	19,200	1,808,300	250,400	0	540	88,700
1916	2,827,000	641,400	1,800,000	20,200	1,868,800	849,600	0	557	93,500
1917	1,860,100	729,800	1,800,000	18,900	1,804,700	176,900	0	537	88,100
1918	1,596,500	589,400	1,800,000	14,600	1,800,000	0	0	466	77,700
1919	1,191,400	371,300	1,505,700	8,300	1,302,600	0	294,300	416	49,200
1920	1,362,000	48,700	1,320,700	2,400	420,900	0	479,300	329	12,300
1921	1,580,300	87,600	1,576,000	5,600	1,361,500	0	224,000	344	42,700
1922	2,376,800	86,300	1,800,000	15,000	1,652,700	0	0	443	69,300
1923	1,604,900	648,100	1,800,000	16,400	1,800,000	0	0	500	82,900
1924	466,100	436,600	844,300	1,900	536,400	0	955,700	394	17,800
1925	1,413,400	56,500	1,387,600	2,600	111,400	0	412,400	298	2,900
Total	32,675,600		28,984,500	225,000	25,008,000	3,970,400	3,415,500		
Average	1,815,300		1,610,300	12,500	1,389,300	220,600	189,700	490	62,000

VOIR ON SAN JOAQUIN RIVER

POWER YIELD

BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9a, page 332.)

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F.0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft; snow-water floods, 14,200 sec.-ft.
Maximum space required for flood control—rain-water floods, 133,000 ac.-ft; snow-water floods, 177,000 ac-ft.

Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year
797,100	1,800,000	13,700	1,699,100	0	0	0	488	73,800	1908
98,400	1,800 000	17,800	1,820,300	605,900	0	0	503	85,100	1909
791,100	1,800,000	16,500	1,868,200	401,300	66,500	0	506	86,200	1910
264,100	1,800,000	19,500	1,842,400	1,176,100	74,600	0	542	91,000	1911
713,700	1,686,900	10,200	1,510,300	0	0	113,100	454	60,900	1912
40,300	863,300	100	0	0	0	936,700	0	0	1913
51,000	1,800,000	18,600	1,821,400	357,900	0	0	510	86,400	1914
758,400	1,800,000	18,600	1,819,600	287,700	0	0	530	87,800	1915
587,100	1,800,000	19,400	1,838,500	644,200	232,200	0	544	90,300	1916
679,800	1,800,000	18,600	1,805,100	57,600	69,200	0	532	87,500	1917
589,400	1,800,000	14,600	1,800,000	0	0	0	466	77,700	1918
371,300	1,505,700	8,300	1,302,600	0	0	294,300	416	49,200	1919
48,700	1,320,700	2,400	420,900	0	0	479,300	329	12,300	1920
87,600	1,576,000	5,600	1,361,500	0	0	224,000	344	42,700	1921
86,300	1,800,000	15,000	1,652,700	0	0	0	443	69,300	1922
648,100	1,800,000	16,400	1,800,000	0	0	0	500	82,900	1923
436,600	844,300	1,900	536,400	0	0	955,700	394	17,800	1924
56,500	1,387,600	2,600	111,400	0	0	412,400	298	2,900	1925
	28,984,500	219,800	25,010,400	3,530,700	442,500	3,415,500			Total
	1,610,300	12,200	1,389,500	196,100	24,600	189,700	484	61,400	Average

TABLE 10. TEMPERANCE FLAT RESER
COMPARISON OF WATER
FOR
TWO METHODS OF

Yearly Summary of Computations
(For corresponding monthly sum

Height of dam 595 feet.

Capacity of reservoir 1,071,000 acre-feet.

Year	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1908	1,115,000	797,100	1,800,000	13,700	1,699,100	0	0	0	488	73,800
1909	3,136,700	98,400	1,800,000	17,800	1,820,300	605,900	0	0	503	85,100
1910	1,825,500	791,100	1,800,000	16,500	1,868,200	401,300	66,500	0	506	86,200
1911	3,562,200	264,100	1,800,000	19,500	1,842,400	1,176,100	74,600	0	542	91,000
1912	1,023,700	713,700	1,686,900	10,200	1,510,300	0	0	113,100	454	60,900
1913	874,100	40,300	863,300	100	0	0	0	936,700	0	0
1914	2,905,300	51,000	1,800,000	18,600	1,821,400	357,900	0	0	510	86,400
1915	1,954,600	758,400	1,800,000	18,600	1,819,600	287,700	0	0	530	87,800
1916	2,827,000	587,100	1,800,000	19,400	1,838,500	644,200	232,200	0	544	90,300
1917	1,860,100	679,800	1,800,000	18,600	1,805,100	57,600	69,200	0	532	87,500
1918	1,596,500	589,400	1,800,000	14,600	1,800,000	0	0	0	466	77,700
1919	1,191,400	371,300	1,505,700	8,300	1,302,600	0	0	294,300	416	49,200
1920	1,362,000	48,700	1,320,700	2,400	420,900	0	0	479,300	329	12,300
1921	1,580,300	87,600	1,576,000	5,600	1,361,500	0	0	224,000	344	42,700
1922	2,376,800	86,300	1,800,000	15,000	1,652,700	0	0	0	443	69,300
1923	1,604,900	648,100	1,800,000	16,400	1,800,000	0	0	0	500	82,900
1924	466,100	436,600	844,300	1,900	536,400	0	0	955,700	394	17,800
1925	1,413,400	56,500	1,387,600	2,600	111,400	0	0	412,400	298	2,900
Total	32,675,600		28,984,500	219,800	25,010,400	3,530,700	442,500	3,415,500		
Average	1,815,300		1,610,300	12,200	1,389,500	196,100	24,600	189,700	484	61,400

VOIR ON SAN JOAQUIN RIVER.
AND POWER YIELD

FLOOD CONTROL

Carried out on a Daily Basis.
mary, see Table 10a, page 342.)

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum reservoir space required (rain-water floods 133,000 ac.-ft., snow-water floods 177,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of year in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year
797,100	1,800,000	13,700	1,699,100	0	0	0	488	73,800	1908
98,400	1,800,000	16,500	1,833,000	724,500	0	0	488	83,700	1909
661,100	1,800,000	16,000	1,848,200	377,500	0	0	496	83,900	1910
244,900	1,800,000	19,300	1,847,100	1,237,600	0	0	536	90,600	1911
703,100	1,676,500	10,000	1,494,600	0	0	123,500	454	59,900	1912
40,300	863,300	100	0	0	0	936,700	0	0	1913
51,000	1,800,000	17,500	1,832,100	497,400	0	0	495	85,000	1914
609,300	1,800,000	16,700	1,823,000	258,400	0	0	503	84,600	1915
465,800	1,800,000	18,000	1,862,900	852,100	4,200	0	522	89,000	1916
555,600	1,800,000	16,500	1,815,900	169,500	0	0	498	83,700	1917
413,800	1,800,000	11,300	1,662,100	0	0	0	423	64,600	1918
199,000	1,336,800	4,900	1,100,500	0	0	463,200	357	35,500	1919
48,700	1,320,700	2,400	420,900	0	0	479,300	329	12,300	1920
87,600	1,576,000	5,600	1,361,500	0	0	224,000	344	42,700	1921
86,300	1,800,000	13,800	1,664,900	91,400	0	0	431	68,200	1922
545,700	1,800,000	14,900	1,800,000	0	0	0	473	79,000	1923
335,700	744,200	1,100	313,900	0	0	1,055,800	378	10,100	1924
56,500	1,387,600	2,600	111,400	0	0	412,400	298	2,900	1925
	28,705,100	200,900	24,491,100	4,208,400	4,200	3,694,900			Total
	1,594,700	11,200	1,360,600	233,800	200	205,300	467	58,300	Average

TABLE 11. TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY YEARS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9 and 10.

(For corresponding monthly summary, see Table 11a, page 352.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year	Without flood contro			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1908	1,800,000	0	73,800	1,800,000	0	73,800	1,800,000	0	73,800
1909	1,800,000	0	85,800	1,800,000	0	85,100	1,800,000	0	83,700
1910	1,800,000	0	91,100	1,800,000	0	86,200	1,800,000	0	83,900
1911	1,800,000	0	91,900	1,800,000	0	91,000	1,800,000	0	90,600
1912	1,686,900	113,100	60,900	1,686,900	113,100	60,900	1,676,500	123,500	59,900
1913	863,300	936,700	0	863,300	936,700	0	863,300	936,700	0
1914	1,800,000	0	86,600	1,800,000	0	86,400	1,800,000	0	85,000
1915	1,800,000	0	88,700	1,800,000	0	87,800	1,800,000	0	84,600
1916	1,800,000	0	93,500	1,800,000	0	90,300	1,800,000	0	89,000
1917	1,800,000	0	88,100	1,800,000	0	87,500	1,800,000	0	83,700
1918	1,800,000	0	77,700	1,800,000	0	77,700	1,800,000	0	64,600
1919	1,505,700	294,300	49,200	1,505,700	294,300	49,200	1,336,800	463,200	35,500
1920	1,320,700	479,300	12,300	1,320,700	479,300	12,300	1,320,700	479,300	12,300
1921	1,576,000	224,000	42,700	1,576,000	224,000	42,700	1,576,000	224,000	42,700
1922	1,800,000	0	69,300	1,800,000	0	69,300	1,800,000	0	68,200
1923	1,800,000	0	82,900	1,800,000	0	82,900	1,800,000	0	79,000
1924	844,300	955,700	17,800	844,300	955,700	17,800	744,200	1,055,800	10,100
1925	1,387,600	412,400	2,900	1,387,600	412,400	2,900	1,387,600	412,400	2,900
Total	28,984,500	3,415,500		28,984,500	3,415,500		28,705,100	3,694,900	
Average	1,610,300	189,700	62,000	1,610,300	189,700	61,400	1,594,700	205,300	58,300

San Gabriel Reservoir on the San Gabriel River.

The "Coordinated Plan" * in southern California contemplates the construction of reservoirs on all streams of suitable terrain for joint operation in controlling floods and conserving water now unused. It provides on each stream, to the extent desirable and to the extent that physical conditions permit, for the coordination of flood control with irrigation and municipal supply through both surface and underground storage. It proposes, wherever possible, that flood control be coordi-

* See Bul. No. 12, "Summary Report on the Water Resources of California and a Coordinated Plan for their Development," Division of Engineering and Irrigation, State Department of Public Works.

nated with the charging of the underground basins, from which such a large part of local supplies are obtained, with practically the entire unused seasonal run-off. The irregularly occurring flood waters would be reduced by surface reservoirs to flows of a workable size for introducing into the subterranean basins but the principal storage of water for equalizing the intermittent run-off would be in the large natural underground basins on the lower reaches of the streams wherever they are available. In their natural state, flood waters rush down the channels in volumes too large for complete absorption by the underground basins even with extensive spreading works. By reducing these flood flows through reservoir control, practically their entire volume may be introduced into the underground basins either through absorption by the natural stream channels or by artificially prepared spreading works. This water may then be pumped from wells penetrating the subterranean basins at such times and for such purposes as necessity demands. It is available for useful purposes in the same way that most of the local supplies in southern California are now obtained. In some instances, it may be a matter of economy to take part of the additional water made available through the construction of surface storage, directly from the reservoir without incurring the expense of sinking it underground and pumping it out again. Reservoir operation under the "Coordinated Plan," therefore involves all or in part, the control of floods, the temporary storage of flood water to be released later at a convenient time and rate for sinking underground, and the equalization of some of the run-off between seasons for an independent surface supply. A description of this plan for southern California is contained in Bulletin No. 17, "The Coordinated Plan of Water Development in Southern California."

The method devised by the "Coordinated Plan" for operating surface reservoirs in southern California in order to secure the greatest use of their capacity for both flood control and conservation is illustrated in the following pages. The San Gabriel River is employed for this purpose through the exemplary use of the San Gabriel reservoir. This river, in having the longest record * of daily flow, is found to be the most favorable of large southern California streams for an analysis of the characteristics of flood flow and is so used in the previous chapters. The San Gabriel reservoir extends up the east and west branches of the San Gabriel River from its dam site which is immediately below the forks and eight miles up the canyon from the edge of the valley floor. The reservoir is proposed for construction by the Los Angeles County Flood Control District. Since, at the time of preparing this text, the desirable capacity for this reservoir is still under discussion, two capacities are employed in the illustrations, one 180,000 and the other 240,000 acre-feet. These correspond to dam heights of 383 and 425 feet, respectively.

Capacity as large as these is not necessary for flood protection alone. The removal of the flood menace requires only that flow be limited to an amount that will pass down the river channel without endangering life or inflicting serious property damage. Flows exceeding 10,000

* The Santa Ana has a record almost as long as the San Gabriel River, but part for the 1916 flood is missing. This makes it less suitable for the purpose at hand than the San Gabriel River since 1916 is the largest flood year of the period of measurement.

second-feet * have passed to the ocean without serious difficulty within the last several years. Exclusive of space that should be provided for the accumulation of silt and debris, the limitation of floods to 10,000 second-feet requires only 75,000 acre-feet of reservoir capacity. Similarly, 52,000 acre-feet is sufficient to limit flood flows to 15,000 second-feet (see p. 61). Capacity in excess of these amounts, employed for limiting floods to more convenient sizes, is essentially useful in conserving water that would otherwise waste into the ocean. It makes possible the sinking of greater portions of the total run-off into the underground basins than could be done with flows as large as 10,000 or 15,000 second-feet. The illustrations herein, limit flows to 1900 second-feet, an amount that, it is believed, can be sunk conveniently into the large subterranean basin underlying the San Gabriel Valley.

A rule for operating a reservoir on the San Gabriel River that will limit floods to 1900 second-feet, is developed in the previous chapters of this volume. It is expressed on Plate XXI, "Reservoir Operating Diagram for Controlling Floods on the San Gabriel River," p. 88. It would limit floods at Azusa, including the maximum of record, to 1900 second-feet. The maximum flood of record on the San Gabriel River occurred on January 18, 1916, and discharged 40,000 second-feet. To limit this and even larger floods to 1900 second-feet, requires the reservation at times of a maximum space for flood control of 131,000 acre-feet.

The use of the operating diagram on Plate XXI for controlling floods by a reservoir as far upstream as the San Gabriel, slightly exceeds the technical limits of its application. If the technical limitations were strictly adhered to, not more than half the 16 square miles of drainage area below the San Gabriel reservoir but tributary to the Azusa gaging station, should remain uncontrolled since this area may produce floods at long intervals about double the desired regulated flow of 1900 second-feet. However, the only consequence of applying the diagram to the San Gabriel reservoir is that the desired maximum flow of 1900 second-feet at Azusa will be exceeded at average intervals of several decades by the uncontrolled run-off originating downstream from the dam. The probable limit in the rate of flow at Azusa would be about double the desired quantity, but several centuries may elapse between flows approaching such magnitude. At times of excess flow at Azusa the gates at the dam would be closed if operated in accord with the reservoir operating diagram. The excess flow would all originate downstream from the reservoir.

In using the reservoir operating diagram of Plate XXI for limiting the maximum flow to 1900 second-feet, only 131,000 acre-feet of the total capacity of the San Gabriel reservoir need be employed for this purpose. A diagram could be constructed that would employ a greater capacity and regulate the flow to less than 1900 second-feet, however, if applied to the San Gabriel reservoir, the desired regulated flow, if made much less than 1900 second-feet, would be exceeded rather frequently by the run-off from the drainage area downstream from the dam. If the maximum flood control reserve were increased, say to 160,000 acre-feet, the flow might be limited to 1000 second-feet at Azusa except at the times the drainage area between the dam site and

* The crest discharge at Azusa was 8,680 second-feet on March 7, 1918, 22,300 second-feet on December 19, 1921, and 11,600 second-feet on February 9, 1922.

Azusa produces a greater amount. This might occur every few years but the accumulated duration of flows in excess of 1000 second-feet would be reduced and less effort would be required in sinking the water into the underground basin. However, since it is believed that flows approximating 1900 second-feet may be made to percolate into the underground basin at a cost small in comparison with that of 29,000 acre-feet of additional reservoir capacity, 1900 second-feet was selected as a suitable regulated flow for illustrating the principles of coordinating flood control and conservation in the same reservoir.

The reservoir operating diagram, in addition to securing the control of floods through the reservation of adequate space at all times for temporarily detaining excess flow that might occur under the circumstances then existing, accomplishes the storage of water in amounts varying with the season. Through holding in reserve only the space required for the control of floods that may occur under existing circumstances and releasing this reserve immediately as the possibility of its need for flood control has passed, run-off may be stored in the part of the maximum flood control reserve not required at that time for flood control. In this way during many seasons, considerable volumes of stored water are accumulated without the use of reservoir space other than that included in the maximum flood control reserve, and this is done without jeopardizing the certainty of the control effected. The water so stored may be drawn from the reservoir at whatever rate and time desired during the season of its detention. Should it be held into the next flood season, it is subject to release as flood control water if the space occupied by it is needed in the flood control reserve.

Where the reservoir capacity exceeds the maximum flood control reserve required by the diagram, as in the illustrations herewith, the excess capacity may be employed either for the seasonal or over-year storage of water. If employed for seasonal storage, its yield will be of the same character as the water stored seasonally in the unused part of the maximum flood control reserve and will augment the quantity of stored water available in irregular amounts from season to season. If employed for over-year storage, its yield may be drawn from the reservoir in uniform amounts through all seasons and so constitute an independent surface supply that does not require auxiliary sources during seasons of deficient run-off. Thus the yield of reservoirs under the "Coordinated Plan" may be divided into three parts, namely, the variable flow of limited size that occurs during the winter and spring months as a result of the flood control operations, the seasonally stored water that may be drawn from the reservoir at any desired rate and time during the summer and fall of the year of its detention, and the flow equalized between seasons that may be drawn off at a uniform rate year in and year out. The yield of the first class, in passing down the channel in flows of limited size but at the time of natural run-off, is controlled in volume of flow only, while that of the second and third class, in being stored water, is controlled both in time and volume. The yield of all three classes is useful. The first, arriving in the winter and spring in flows of limited size, may be sunk underground as it occurs. The second, in being stored water, may be drawn from the reservoir as convenient either for sinking underground or for supplementing surface supplies. It being of irregular amount from season

to season and in some seasons there being none at all, the yield of the second class can not become an independent source of supply without further equalization in an underground basin. The yield of the third class, in being equalized between seasons, may constitute an independent surface supply.

These three classes into which the yield may be divided, together with the water passed for prior rights and evaporated from the reservoir surface, include the entire surface run-off of the stream. Reservoir capacity just equal to the required maximum flood control reserve will convert the entire mean seasonal run-off into yield of the first two classes. Capacity in addition to this either changes part of the yield of the first class to yield of the second class or from the first two classes to the third, according as the space in excess of the maximum flood control reserve is employed for seasonal or over-year storage. On streams having a large subterranean basin on their lower courses, the total useful yield of a reservoir can not be increased by enlarging the capacity to an amount exceeding the maximum flood control reserve required to control flows to a size that may be completely sunk into the underground basin. The function of additional reservoir capacity is limited to making the water available more conveniently either in smaller flows or at special times of the year.

Analyses were made of the 30 years of stream flow record on the San Gabriel River to determine the yield of the San Gabriel reservoir under several modes of operation. In these tests it is assumed that the reservoir was in existence at the beginning of the period and was operated through the succeeding 30 years as described in the several instances. The destruction of reservoir capacity by the accumulation of silt and debris is neglected and the first 152 second-feet of natural flow are passed for prior rights. The water passed for prior rights in all modes of reservoir operation and for all reservoir capacities constitutes 40.5 per cent of the total surface run-off of the period of analysis.

The application of the reservoir operating diagram herein described to the daily flows throughout the 30-year period of record, results in the average yield on the part of the maximum flood control reserve which is the first 131,000 acre-feet of capacity, of 37,100 acre-feet per season during the winter and spring months in flows controlled to less than 1900 second-feet and of 36,700 acre-feet per season in seasonally stored water that may be drawn from the reservoir as desired within the year of its detention. These yields are 29.6 and 29.2 per cent respectively of the average run-off for the period. Some water is stored in 27 of the 30 seasons analyzed but in no season is the entire 131,000 acre-feet filled. The nearest to filling is in 1907 when 110,300 acre-feet are held in storage. This reservoired water, in being stored with facilities required to secure the desired limit to flood flows of 1900 second-feet, is held without extra expense. Together with the winter and spring controlled flows resulting from flood regulation, it constitutes the entire run-off from the San Gabriel watershed tributary to Azusa, with the exception of the water passed for prior rights and evaporated from the reservoir surface.

With a capacity of 180,000 acre-feet, the space in excess of the maximum flood control reserve (131,000 acre-feet), if employed for seasonal storage in conjunction with flood control, would convert 17,400 acre-

feet of the average winter and spring yield in controlled flows of the maximum flood control reserve, into 17,100 acre-feet of seasonally stored water. On an average about 300 acre-feet per season would be lost by evaporation in doing this. Similarly, with a capacity of 240,000 acre-feet, the space in excess of the maximum flood control reserve (131,000 acre-feet) would convert 28,800 acre-feet of the average winter and spring yield in controlled flows of the maximum flood control reserve, into 28,400 acre-feet of seasonally stored water. About 400 acre-feet per season would be lost by evaporation on the average in doing this. These yields are 13.6 and 22.6 per cent respectively of the average run-off of the 30-year period. Thus, in a capacity of 180,000 acre-feet, the 49,000 acre-feet additional to the maximum flood control reserve would convert on an average 17,100 acre-feet of yield controlled only in volume, to yield controlled both in time and volume or one acre-foot for each 2.9 acre-feet of storage capacity. In a capacity of 240,000 acre-feet, the 60,000 acre-feet additional to 180,000 acre-feet, would similarly convert on an average 11,300 acre-feet per season from flow controlled only in volume to flow controlled both in time and volume, or one acre-foot for each 5.3 acre-feet of storage capacity.

If the capacity in excess of the maximum flood control reserve of 131,000 acre-feet were employed for over-year instead of seasonal storage in conjunction with flood control, a uniformly continuous supply of 22 second-feet or 15,900 acre-feet per season could be drawn from a capacity of 180,000 acre-feet. Similarly, a uniformly continuous supply of 32* second-feet or 23,300 acre feet per season could be drawn from a capacity of 240,000 acre-feet. These yields are 12.7 and 18.6 per cent, respectively, of the average run-off of the 30-year period. In both instances this water would be derived from the winter and spring controlled flows and the seasonally stored water of the maximum flood control reserve. Thus, in a capacity of 180,000 acre-feet, the 49,000 acre-feet additional to the maximum flood control reserve would convert 3300 acre-feet per season controlled only in volume together with 14,000 acre-feet controlled both in time and volume but not equalized between seasons, into 15,900 acre-feet per season controlled both in time and volume and equalized between the years, or one acre-foot per season brought under complete control for each 3.1 acre-feet of additional capacity. On an average about 1400 acre-feet per season would be lost by evaporation in doing this. In a capacity of 240,000 acre-feet, the 60,000 acre-feet additional to the 180,000 acre-feet would similarly convert 11,600 acre-feet per season controlled only in volume into 10,600 acre-feet per season controlled in both time and volume, of which 7400 acre-feet per season would be equalized between seasons, or one acre-foot per season brought under control as to time for each 5.7 acre-feet of additional storage capacity.

* In the analyses of reservoir yield for the period of measured run-off, Tables 13 and 13*a*, a yield of 41 second-feet continuous flow is obtained from Jan. 1, 1897, to Oct. 1, 1926, with a draft of 61,300 acre-feet on water stored in the reservoir prior to the beginning of the period. At the time of making the computations, it was thought that the rainfall of the seasons just prior to Jan. 1, 1897, would yield this extra water so that 41 second-feet would be the long time average yield; however, subsequent detail study of rainfall records indicates that it is improbable that so large an amount of extra water would have accumulated during the seasons just prior to 1897, but, sufficient would probably have accumulated to increase the yield considerably over that for the exact period of analyses. The exact yield in continuous flow for the period Jan. 1, 1897, to Oct. 1, 1926, is 32 second-feet or 23,300 acre-feet per season.

On an average about 1000 acre-feet per season would be lost by evaporation in doing this.

The three following tables summarize the yield of 180,000 and 240,000 acre-feet of capacity operated in accordance with the "Coordinated Plan" and compare it with the yield of the maximum flood control reserve if not employed in conjunction with additional capacity. The first two tabulate the average run-off divided between the yield in prior rights water, controlled flows resulting from flood regulation, seasonally stored water, continuous uniform flow equalized between seasons by over-year storage, and evaporation loss from the reservoir surface. The first table assumes that the space in addition to the maximum flood control reserve is employed for seasonal storage in conjunction with the flood control operations and the second table for over-year storage. The third table further segregates the yields of the first two tables according to the size of total flows passing Azusa. Still further detail is printed in the tables of yearly summaries at the end of this section and in the tables of monthly summaries in Chapter VIII. The actual computations were carried out on a daily basis to meet the requirements of the reservoir operating diagram which calls for a daily adjustment of reservoir level during the flood season. The daily computations are too voluminous to place in print.

It may be observed on reviewing the three following tables that the maximum flood control reserve, without additional capacity, controls all floods and renders the entire run-off of the stream, except for 0.7 per cent loss by evaporation, available for sinking underground. It yields 29.2 per cent of the average run-off in seasonally stored water but does not create an independent surface supply. The two larger capacities employed for flood control and seasonal storage, control all floods and render the entire run-off, except for slightly larger evaporation losses, available for sinking underground. However, a larger fraction of the average run-off is made available as seasonally stored water. The two larger capacities convert 42.9 and 51.9 per cent, respectively, of the average run-off into seasonally stored water instead of 29.2 per cent, the yield of the maximum flood control reserve without additional capacity. In so doing the two larger capacities do not conserve more water but rather make larger portions of the average run-off more conveniently available. When employed for over-year storage in conjunction with flood control, the two larger capacities still control all floods and render the entire run-off of the stream available for sinking underground if desired, but 12.7 and 18.6 per cent, respectively, of the average run-off is in a uniformly continuous yield suitable for direct diversion from the reservoir for municipal purposes. The losses by evaporation from the reservoir surface are 1.8 and 2.6 per cent, respectively, in doing this. In all instances 40.5 per cent of the average run-off passes the dam to satisfy downstream prior surface rights.

In size of total flow passing Azusa, the maximum flood control reserve yields 66.4 per cent of the average run-off in flows of less than 500 second-feet and 73.5 per cent in flows less than 1000 second-feet. The two larger capacities of 180,000 and 240,000 acre-feet, employed for flood control and seasonal storage, yield 85.7 and 93.5 per cent of their water, respectively, in flows less than 1000 second-feet. Employed for flood control in conjunction with over-year storage, 180,000 acre-

feet of capacity would yield 74.3 per cent of the average run-off in flows of less than 1000 second-feet. Had a reservoir operating diagram been constructed to limit flows to 1000 second-feet instead of 1900, as in the foregoing illustrations, its maximum flood control reserve of 160,000 acre-feet would yield over 99 per cent of the average run-off in flows of size less than 1000 second-feet. For a total capacity of 180,000 acre feet, the division of the yield into controlled flows and seasonally stored water, however, would be different, the amount of the seasonally stored water being less.

AVERAGE WATER YIELD OF SAN GABRIEL RESERVOIR UNDER "COORDINATED PLAN."
FLOOD CONTROL AND SEASONAL STORAGE COORDINATED
January 1, 1897 to October 1, 1926

(For yearly values, see Table 12, page 158.)

Item	**Maximum flood control reserve** or first 131,000 acre-feet of capacity		**180,000** acre-feet capacity		**240,000** acre-feet capacity	
	Acre-feet per season	Per cent of average seasonal run-off	Acre-feet per season	Per cent of average seasonal run-off	Acre-feet per season	Per cent of average seasonal run-off
Passed by dam for prior rights (first 152 second-feet of natural flow)	50,900	40.5	50,900	40.5	50,900	40.5
Flood control water passing Azusa during flood season at rates less than 1,900 second-feet	37,100	29.6	19,700	15.7	8,300	6.6
Seasonally stored water	36,700	29.2	53,800	42.9	65,100	51.9
Evaporation from reservoir surface	800	0.7	1,100	0.9	1,200	1.0
Total	125,500	100.0	125,500	100.0	125,500	100.0

AVERAGE WATER YIELD OF SAN GABRIEL RESERVOIR UNDER "COORDINATED PLAN." FLOOD CONTROL, SEASONAL AND OVER-YEAR STORAGE COORDINATED

January 1, 1897 to October 1, 1926

(For yearly values, see Table 13, page 160.)

Item	**Maximum flood control reserve** or first 131,000 acre-feet of capacity		**180,000** acre-feet capacity		**240,000** acre-feet capacity	
	Acre-feet per season	Per cent of average seasonal run-off	Acre-feet per season	Per cent of average seasonal run-off	Acre-feet per season	Per cent of average seasonal run-off
Passed by dam for prior rights (first 152 second-feet of natural flow)	50,900	40.5	50,900	40.5	50,900	40.5
Flood control water passing Azusa during flood season at rates less than 1,900 second-feet	37,100	29.6	[a]33,800	26.9	[b]22,200	17.7
Seasonally stored water	36,700	29.2	22,700	18.1	[b]25,900	20.6
Yield in a uniformly continuous flow	0	0	15,900	12.7	[b]23,300	18.6
Evaporation from reservoir surface	800	0.7	2,200	1.8	3,200	2.6
Total	125,500	100.0	125,500	100.0	125,500	100.0

[a] The average yield in flood control water shown in Tables 13 and 13a from which this summary is compiled, is 34,000 acre-feet per season. In the computations for these tables, the period of analysis closed with 7,600 acre-feet less water in storage than at the beginning. This water, the equivalent of 200 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first year. Therefore, it is deducted from the average yield in flood control water shown in Tables 13 and 13a to obtain the exact yield for the period of analysis.

[b] The average yield in flood control water, seasonally stored water and uniformly continuous flow shown in Tables 13 and 13a from which this summary is compiled, is 30,000, 13,800 and 29,700 acre-feet per season, respectively. In the computations for these tables the period of analysis closed with 61,300 acre-feet less water in storage than at the beginning. This water, the equivalent of 2,060 acre-feet per season, entered storage prior to the beginning of the period. To obtain the exact yield for the period, a supplementary analysis was made having the same amount of water in storage at the beginning and at the end of the period. This gave the smaller values for flood control water of 22,200 acre-feet per season and for uniformly continuous flow of 23,300 acre-feet per season, and the larger value for seasonally stored water of 25,900 acre-feet per season, entered herein.

AVERAGE SIZE OF FLOWS
OF
WATER YIELD OF SAN GABRIEL RESERVOIR UNDER "COORDINATED PLAN."
Jan. 1, 1897 to Oct. 1, 1926.

(For yearly values see Table 14, page 162.)

Maximum controlled flow at Azusa 1,900 second-feet. **Maximum flood control reserve 131,000 acre-feet.**

Reservoir emptied of seasonal storage each year.

Natural flow up to 152 second-feet passed for prior rights.

Size of total flow at Azusa in second-feet	**Flood control water passing Azusa** during flood season at rates less than 1,900 second-feet in acre-feet per season				**Seasonally stored water** in acre-feet per season				**Yield in uniformly continuous flow** equalized between seasons by over-year storage in acre-feet per season			
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet capacity[a]	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity[c e]	Maximum flood control reserve or first 131,000 acre-feet capacity[b]	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity[d]	Maximum flood control reserve or first 131,000 acre-feet capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity

0- 250	230	90	30	190	14,640	11,720	11,350	6,060	0	0	0	13,540
250- 500	1,370	470	150	1,340	16,240	27,360	16,590	13,630	0	0	0	1,710
500- 750	1,540	1,120	580	1,380	5,800	14,700	29,830	2,980	0	0	0	240
750–1,000	1,500	1,260	680	1,250	0	0	7,300	0	0	0	0	40
1,000–1,250	1,150	890	330	1,550	70	0	0	0	0	0	0	40
1,250–1,500	1,470	730	670	650	0	0	0	0	0	0	0	10
1,500–1,900	29,170	15,170	5,890	27,090	590	0	0	580	0	0	0	350
Total	36,430	19,730	8,330	33,450	37,340	53,780	65,070	23,250	0	0	0	15,930
Aggregate of natural flow up to 152 second-feet passed for prior rights	24,250	24,250	24,250	24,250	26,620	26,620	26,620	26,620	.....	.....	.....	.....
Evaporation loss from reservoir surface	0	0	0	300	800	1,060	1,170	1,900	.....	.....	.....	.....
Grand total	[a] 60,680	43,980	32,580	[c] 58,000	[b] 64,760	81,460	92,860	[d] 51,770	.....	.....	.....	15,930

[a] The aggregate of the entries in this column is smaller than the corresponding entries in the summary table, page 146, and Tables 12 and 12a, from which it is derived, by an average of about 700 acre-feet per season. This water was released in controlling floods during April, 1906, total amount 19,600 acre-feet, but was included in seasonally stored water in preparing this table.

[b] The aggregate of the entries in this column is larger than the corresponding entries in the summary table, page 146, and Tables 13 and 13a, from which it is derived, by an average of about 700 acre-feet per season. This water was released in controlling floods during April, 1906, total amount 19,600 acre-feet, but was included in seasonally stored water in preparing this table.

[c] The aggregate of the entries in this column is smaller than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in seasonally stored water in preparing this table.

[d] The aggregate of the entries in this column is larger than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in the seasonally stored water in preparing this table.

[e] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7,600 acre-feet less water in storage than at the beginning. This water, the equivalent of about 200 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

AVERAGE SIZE OF FLOWS
OF
WATER YIELD OF SAN GABRIEL RESERVOIR UNDER "COORDINATED PLAN"—Concluded.

Jan. 1, 1897 to Oct. 1, 1926.

(For yearly values see Table 14, page 162.)

Maximum controlled flow at Azusa 1,900 second-feet. **Maximum flood control reserve 131,000 acre-feet.**

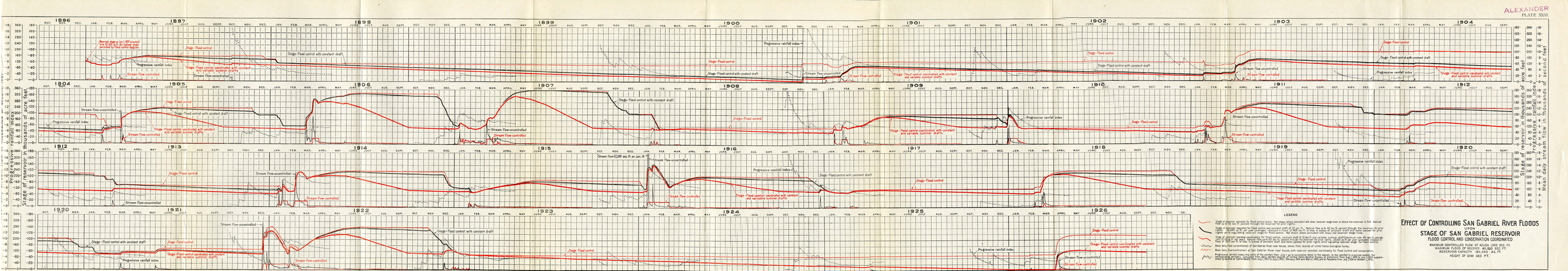
Reservoir emptied of seasonal storage each year.

Natural flow up to 152 second-feet passed for prior rights.

Size of total flow at Azusa in second-feet	Total yield							
	In acre-feet per season				In per cent of average seasonal run-off			
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity[a]	Maximum flood control reserve or first 131,000 acre-feet capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity[a]
0– 250	14,870	11,810	11,380	19,790	11.9	9.4	9.1	15.8
250– 500	17,610	27,830	16,740	16,680	14.0	22.2	13.3	13.3
500– 750	7,340	15,820	30,410	4,600	5.9	12.6	24.2	3.7
750–1,000	1,500	1,260	7,980	1,290	1.2	1.0	6.4	1.0
1,000–1,250	1,220	890	330	1,590	1.0	0.7	0.3	1.3
1,250–1,500	1,470	730	670	660	1.2	0.6	0.5	0.5
1,500–1,900	29,760	15,170	5,890	28,020	23.7	12.1	4.7	22.3
Total	73,770	73,510	73,400	72,630	58.9	58.6	58.5	57.9
Aggregate of natural flow up to 152 second-feet passed for prior rights	50,870	50,870	50,870	50,870	40.5	40.5	40.5	40.5
Evaporation loss from reservoir surface	800	1,060	1,170	2,200	0.6	0.9	1.0	1.8
Grand total	125,440	125,440	125,440	[a]125,700	100.0	100.0	100.0	[a]100.2

[a] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7,600 acre-feet less water in storage than at the beginning. This water, the equivalent of about 200 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

ALEXANDER
PLATE XXVI



Monthly and yearly summaries of the computations from which the foregoing tables were prepared have been assembled, together with summaries of other comparisons made in studying various modes of reservoir operation. The yearly summaries follow herewith but the monthly summaries, because of their bulk, are placed in a separate chapter. Included in these is the test of 180,000 acre-feet reservoir capacity operating as proposed in the "Coordinated Plan" except that, instead of employing the reservoir operating diagram to grade the flood control reserve in accord with current necessities, the maximum amount of 131,000 acre-feet was held empty until April 19th, the close of the flood season. With over-year storage, this change reduced the average yield in seasonal stored water from 22,700 to 3000 acre-feet per season, a reduction of 87 per cent. It also reduced the yield in uniformly continuous flow from 15,900 to 13,000 acre-feet per season. Floods would have been limited to 1900 second-feet just the same.

In addition to the water yield, these computations furnish information upon the reservoir stage under the several conditions of operation. Plate XXVI, "Effect of Controlling San Gabriel River Floods upon the Stage of the San Gabriel Reservoir," delineates the reservoir stage day by day from 1896 to 1927 for three conditions of operation representing three steps in coordinating the several uses of 180,000 acre-feet of reservoir space; first, operating for flood control alone by the reservoir operating diagram, second, operating for flood control in combination with a constant draft from over-year storage, and third, completely coordinating the usefulness of the reservoir space by operating for flood control, a constant draft from over-year storage and a variable summer draft from seasonally stored water.

Plate XXVI assumes that a reservoir of 180,000 acre-feet capacity was in existence in 1896 and operated through subsequent years in accord successively with each of the three conditions of operation above mentioned. The volume of water in storage expressed in acre-feet is shown on every day of the 30-year period by the vertical position on the reservoir space scale, of lines extending across the plate in several rows. The top guide line of each row represents a full reservoir and the bottom line an empty reservoir. The space between each pair of horizontal guide lines represents 20,000 acre-feet.

The light red line delineates the reservoir stage were it operated for flood control alone by releasing water only as required by the reservoir operating diagram. The heavy black line delineates the reservoir stage were it operated for flood control and a constant draft of 22 second-feet from over-year storage. The heavy red line delineates the reservoir stage were it operated coordinately for flood control, a constant draft of 22 second-feet from over-year storage and a variable summer draft from the seasonally stored water. Below the reservoir stage lines in each row is shown in a light black line to a special scale superimposed upon the reservoir stage scale, the unimpaired flow of the river at Azusa and in a light red line, the flow as controlled by the coordination of flood control, seasonal and over-year storage. A line of black dots shows the daily value of the progressive rainfall index used in entering the reservoir operating diagram to determine the necessary flood control reserve.

The following table shows the average size of the total flow passing Azusa for the three steps in coordinating the use of reservoir space described above.

AVERAGE SIZE OF FLOWS OF WATER YIELD FROM SAN GABRIEL RESERVOIR FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Jan. 1, 1897 to Oct. 1, 1926.

(For yearly values, see Table 18, page 186.)

Height of dam 383 feet. **Maximum controlled flow at Azusa 1,900 second-feet.**

Capacity of reservoir 180,000 acre-feet. **Maximum flood control reserve 131,000 acre-feet.**

Natural flow up to 152 second-feet passed for prior rights.

Size of total flow at Azusa in second-feet	**Flood control alone** Water drawn from reservoir only as required by reservoir operating diagram			**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram				**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period, constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram "Coordinated Plan"			
	Flood control water and waste over spillway passing Azusa at rates less than 1,900 second-feet in acre-feet per season[a f]	Seasonally stored water released as a variable summer flow in acre-feet per season	Total in acre-feet per season[a]	Flood control water and waste over spillway passing Azusa at rates less than 1,900 second-feet in acre-feet per season[b g]	Seasonally stored water released as a variable summer flow in acre-feet per season	Constant flow from over-year storage in acre-feet per season	Total in acre-feet per season[b]	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet per season[c d]	Seasonally stored water released as a variable summer flow in acre-feet per season[c]	Constant flow from over-year storage in acre-feet per season	Total in acre-feet per season[b c]
0– 250	740	0	740	300	0	14,860	15,160	190	6,060	13,540	19,790
250– 500	2,870	0	2,870	2,160	0	190	2,350	1,340	13,630	1,710	16,680
500– 750	3,820	0	3,820	3,100	0	140	3,240	1,380	2,980	240	4,600
750–1,000	4,200	0	4,200	3,300	0	100	3,400	1,250	0	40	1,290
1,000–1,250	4,000	0	4,000	3,430	0	80	3,510	1,550	0	40	1,590
1,250–1,500	2,750	0	2,750	2,290	0	40	2,330	650	0	10	660
1,500–1,900	51,660	0	51,660	41,740	0	520	42,260	27,090	580	350	28,020
Total	70,040	0	70,040	56,320	0	15,930	72,250	33,450	23,250	15,930	72,630

Aggregate of natural flow up to 152 second-feet passed for prior rights....	24,250	26,620	50,870	24,250	26,620	.....	50,870	24,250	26,620	.....	50,870
Evaporation loss from reservoir surface..	460	2,480	2,940	390	2,190	.....	2,580	300	1,900	.....	2,200
Grand total.....	[a] 94,750	29,100	[a] 123,850	[b] 80,960	28,810	15,930	[b] 125,700	[cd] 58,000	[e] 51,770	15,930	[c] 125,700

[a] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 47,700 acre-feet more water in storage than at the beginning, the equivalent of about 1,600 acre-feet per season. It should be added to the average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[b] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 7,600 acre-feet less water in storage than at the beginning. This water, the equivalent of about 200 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[c] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 7,600 acre-feet less water in storage than at the beginning. This water, the equivalent of about 200 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

[d] The aggregate of the entries in this column is smaller than the corresponding entries in Tables 16 and 16a, from which it is derived, by an average of about 500 acre-feet per season This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in the seasonally stored water in preparing this table.

[e] The aggregate of the entries in this column is larger than the corresponding entries in Tables 16 and 16a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in the seasonally stored water in preparing this table.

[f] Waste over spillway is included in these entries for year 1907, as follows: May, flow 0–250 second feet, 172 acre-feet; 250–500 second feet, 1728 acre-feet; June, flow 0–250 second feet, 2494 acre-feet; 250–500 second feet, 2844 acre-feet; July, flow 0–250 second feet, 188 acre-feet.

[g] Waste over spillway is included in these entries for year 1907, as follows: June, flow 0–250 second feet, 1244 acre-feet; 250–500 second feet, 2107 acre-feet.

SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

Tables of Yearly Summaries of Water Yield Computed on a Daily Basis.

Showing the effect of coordinating flood control and conservation.
(See Chapter VIII for corresponding monthly summaries.*)

TABLE 12—Yield under "Coordinated Plan," flood control and seasonal storage coordinated. Capacity 180,000 and 240,000 acre-feet.

TABLE 13—Yield under "Coordinated Plan," flood control and seasonal and over-year storage coordinated. Capacity 180,000 and 240,000 acre-feet.

TABLE 14—Average size of flows under "Coordinated Plan." Capacity 180,000 and 240,000 acre-feet.

TABLE 15—Comparison of yield for two methods of flood control. Flood control coordinated with seasonal and over-year storage. Capacity 180,000 acre-feet.

TABLE 16—Comparison of yield for three steps in coordinating the use of reservoir space. Capacity 180,000 acre-feet.

TABLE 17—Comparison of yield operating for flood control and constant draft only. Capacity 180,000 and 240,000 acre-feet.

TABLE 18—Average size of flows for three steps in coordinating the use of reservoir space. Capacity 180,000 acre-feet.

*Monthly summaries not prepared for Tables 14 and 18.

TABLE 12. SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

WATER YIELD UNDER "COORDINATED PLAN"
FLOOD CONTROL AND SEASONAL STORAGE COORDINATED

Yearly Summary of Computations Carried out on a Daily Basis.
(For corresponding monthly summary, see Table 12a, page 360.)

Maximum controlled flow at Azusa 1,900 second-feet. **Maximum flood control reserve 131,000 acre-feet.**
Natural flow up to 152 second-feet passed for prior rights.
Reservoir emptied of seasonal storage each year.

Year	Maximum flood control reserve or first 131,000 acre-feet of capacity					180,000 acre-feet capacity					240,000 acre-feet capacity				
	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet
1897	52,963	4,913	34,488	984	93,348	52,963	0	39,304	1,081	93,348	52,963	0	39,304	1,081	93,348
1898	15,687	0	2,732	190	18,609	15,687	0	2,732	190	18,609	15,687	0	2,732	190	18,609
1899	10,463	0	0	0	10,463	10,463	0	0	0	10,463	10,463	0	0	0	10,463
1900	11,976	0	0	0	11,976	11,976	0	0	0	11,976	11,976	0	0	0	11,976
1901	50,570	32,694	15,717	589	99,570	50,570	0	47,822	1,178	99,570	50,570	0	47,822	1,178	99,570
1902	21,816	0	437	61	22,314	21,816	0	437	61	22,314	21,816	0	437	61	22,314
1903	50,037	6,045	49,747	1,156	106,985	50,037	0	55,685	1,263	106,985	50,037	0	55,685	1,263	106,985
1904	24,180	0	2,482	174	26,836	24,180	0	2,482	174	26,836	24,180	0	2,482	174	26,836
1905	62,587	29,996	70,682	1,450	164,715	62,587	0	100,310	1,818	164,715	62,587	0	100,310	1,818	164,715
1906	67,456	43,937	120,438	2,029	233,860	67,456	2,864	161,113	2,427	233,860	67,456	0	163,981	2,423	233,860
1907	82,808	129,172	138,732	2,178	352,890	82,808	80,172	187,233	2,677	352,890	82,808	20,172	246,672	3,238	352,890

1908	56,444	9,758	6,461	287	72,950	56,444	0	15,887	619	72,950	56,444	0	15,887	619	72,950
1909	72,101	62,243	49,468	1,174	184,986	72,101	13,243	97,859	1,783	184,986	72,101	0	110,956	1,929	184,986
1910	54,518	76,272	2,117	97	133,004	54,518	27,272	50,000	1,214	133,004	54,518	0	76,937	1,549	133,004
1911	70,413	118,339	85,892	1,636	276,280	70,413	69,339	134,347	2,181	276,280	70,413	10,977	192,140	2,750	276,280
1912	47,362	0	25,435	823	73,620	47,362	0	25,435	823	73,620	47,362	0	25,435	823	73,620
1913	40,386	0	9,481	456	50,323	40,386	0	9,481	456	50,323	40,386	0	9,481	456	50,323
1914	72,456	154,577	71,219	1,458	299,710	72,456	105,577	119,650	2,027	299,710	72,456	48,271	176,383	2,600	299,710
1915	73,157	15,828	41,744	1,071	131,800	73,157	0	57,350	1,293	131,800	73,157	0	57,350	1,293	131,800
1916	77,852	152,147	54,093	1,251	285,343	77,852	103,704	101,945	1,842	285,343	77,852	43,704	161,330	2,457	285,343
1917	60,160	9,467	11,487	473	81,587	60,160	0	20,698	729	81,587	60,160	0	20,698	729	81,587
1918	58,741	11,341	65,660	1,398	137,140	58,741	0	76,848	1,551	137,140	58,741	0	76,848	1,551	137,140
1919	37,874	0	0	0	37,874	37,874	0	0	0	37,874	37,874	0	0	0	37,874
1920	60,683	0	51,949	1,229	113,861	60,683	0	51,949	1,229	113,861	60,683	0	51,949	1,229	113,861
1921	54,013	38,907	18,143	649	111,712	54,013	6,295	18,143	649	79,100	54,013	0	18,143	649	72,805
1922	87,587	194,681	93,935	1,700	377,903	87,587	178,450	142,243	2,235	410,515	87,587	124,588	201,811	2,824	416,810
1923	51,298	13,042	1,199	46	65,585	51,298	0	13,714	573	65,585	51,298	0	13,714	573	65,585
1924	25,517	0	360	56	25,933	25,517	0	360	56	25,933	25,517	0	360	56	25,933
1925	21,878	0	1,411	111	23,400	21,878	0	1,411	111	23,400	21,878	0	1,411	111	23,400
*1926	40,320	0	65,743	1,337	107,400	40,320	0	65,743	1,337	107,400	40,320	0	65,743	1,337	107,400
Total	1,513,303	1,103,359	1,091,252	24,063	3,731,977	1,513,303	586,916	1,600,181	31,577	3,731,977	1,513,303	247,712	1,936,001	34,961	3,731,977
Average	50,867	37,088	36,681	809	125,445	50,867	19 729	53,788	1 061	125,445	50,867	8,327	65,076	1,175	125,445

*Partial year, January 1 to October 1.

TABLE 13. SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

WATER YIELD UNDER "COORDINATED PLAN"
FLOOD CONTROL, SEASONAL AND OVER-YEAR STORAGE COORDINATED.

Yearly Summary of Computations Carried out on a Daily Basis.

(For corresponding monthly summary, see Table 13a, page 382.)

Maximum controlled flow at Azusa 1,900 second-feet. **Maximum flood control reserve 131,000 acre-feet.**

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-feet total capacity						240,000 acre-feet total capacity					
	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Total in acre-feet
1897	52,963	4,913	34,488	0	984	93,348	52,963	16,407	16,901	15,922	2,466	104,659	52,963	15,089	0	29,672	3,802	101,526
1898	15,687	0	2,732	0	190	18,609	15,687	0	0	15,922	1,926	33,535	15,687	0	0	29,672	3,170	48,529
1899	10,463	0	0	0	0	10,463	10,463	0	0	15,922	1,448	27,833	10,463	0	0	29,672	2,461	42,596
1900	11,976	0	0	0	0	11,976	11,976	0	0	15,922	796	28,694	11,976	0	0	29,672	1,677	43,325
1901	50,570	32,694	15,717	0	589	99,570	50,570	0	0	15,922	1,846	68,338	50,570	0	0	29,672	2,116	82,358
1902	21,816	0	437	0	61	22,314	21,816	0	0	15,922	1,374	39,112	21,816	0	0	29,672	1,269	52,757
1903	50,037	6,045	49,747	0	1,156	106,985	50,037	0	4,235	15,922	2,293	72,487	50,037	0	0	29,672	1,959	81,668
1904	24,180	0	2,482	0	174	26,836	24,180	0	0	15,965	1,922	42,067	24,180	0	0	29,754	1,168	55,102
1905	62,587	29,996	70,682	0	1,450	164,715	62,587	13,658	54,528	15,922	2,781	149,476	62,587	0	0	29,672	2,931	95,190

1906	67,456	43,937	120,438	0	2,029	233,860	67,456	39,397	107,768	15,922	3,189	233,732	67,456	9,428	82,724	29,672	4,536	193,816
1907	82,808	129,172	138,732	0	2,178	352,890	82,808	127 639	123,335	15,922	3,301	353,005	82,808	127,605	108,051	29,672	4,755	352,891
1908	56,444	9,758	6,461	0	287	72,950	56,444	10,159	0	15,965	2,012	84,580	56,444	11,779	0	29,754	3,216	101,193
1909	72,101	62,243	49,468	0	1,174	184,986	72,101	52,260	32,119	15,922	2.593	174,995	72,101	38,721	15,706	29,672	3,968	160,168
1910	54,518	76,272	2,117	0	97	133,004	54,518	75,162	0	15,922	1,892	147,494	54,518	75,055	0	29,672	3,114	162,359
1911	70,413	118,339	85,892	0	1,636	276,280	70,413	100,816	70,041	15,922	2,916	260,108	70,413	84,954	54,152	29,672	4,309	243,500
1912	47,362	0	25,435	0	823	73,620	47,362	0	7,761	15,965	2,356	73,444	47,362	0	0	29,754	3,658	80,774
1913	40,386	0	9,481	0	456	50,323	40,386	0	0	15,922	2,099	58,407	40,386	0	0	29,672	3,209	73,267
1914	72,456	154,577	71,219	0	1,458	299,710	72,456	145,722	54,901	15,922	2,785	291,786	72,456	123,839	39,467	29,672	4,178	269,612
1915	73,157	15,828	41,744	0	1,071	131,800	73,157	15,984	24,232	15,922	2,514	131,809	73,157	17,290	7,812	29,672	3,869	131,800
1916	77,852	152,147	54,093	0	1,251	285,343	77,852	152,317	36,625	15,965	2,625	285,384	77,852	153,289	20,566	29,754	4,016	285,477
1917	60,160	9,467	11,487	0	473	81,587	60,160	10,464	0	15,922	2,122	88,668	60,160	12,270	0	29,672	3,308	105,410
1918	58,741	11,341	65,660	0	1,398	137,140	58,741	3,595	49,016	15,922	2,741	130,015	58,741	0	20,748	29,672	4,022	113,183
1919	37,874	0	0	0	0	37,874	37,874	0	0	15,922	1,848	55,644	37,874	0	0	29,672	3,150	70,696
1920	60,683	0	51,949	0	1,229	113,861	60,683	0	16,978	15,965	2,454	96,080	60,683	0	0	29,754	3,527	93,964
1921	54,013	38,907	18,143	0	649	111,712	54,013	39,506	606	15,922	2,269	112,316	54,013	20,952	0	29,672	3,225	107,862
1922	87,587	194,681	93,935	0	1,700	377,903	87,587	195,520	77,276	15,922	2,970	379,275	87,587	190,726	61,586	29,672	4,349	373,920
1923	51,298	13,042	1,199	0	46	65,585	51,298	12,056	0	15,922	1,858	81,134	51,298	10,928	0	29,672	3,084	94,982
1924	25,517	0	360	0	56	25,933	25,517	0	0	15,965	1,380	42,862	25,517	0	0	29,754	2,376	57,647
1925	21,878	0	1,411	0	111	23,400	21,878	0	0	15,922	744	38,544	21,878	0	0	29,672	1,601	53,151
[a]1926	40,320	0	65,743	0	1,337	107,400	40,320	0	0	11,909	1,866	54,095	40,320	0	0	22,193	2,054	64,567
Total	1,513,303	1,103,359	1,091,252	0	24,063	3,731,977	1,513,303	1,010,662	676,322	473,905	65,386	3,739,578	1,513,303	891,925	410,812	883,173	94,077	3,793,290
Average	50,867	37,088	36,681	0	809	125,445	50,867	[b]33,972	22,734	15,930	2,198	[b]125,701	50,867	[c]29,981	[c]13,809	[c]29,686	3,162	[c]127,505

[a] Partial year, January 1 to October 1.

[b] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations, this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

[c] These figures contain 61,313 acre-feet total or an average of 2060 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period is less by this amount than on January 1, 1897, the beginning of the period. A supplementary analysis, having the same amount of water in storage at the beginning and at the end of the period, was made to obtain the exact yield for the period. This gave 22,200, 25,900 and 23,300 acre-feet per season, respectively, for the flood control water, seasonally stored water, and uniformly continuous flow instead of 29,981, 13,809 and 29,686 acre-feet, respectively, that are shown herein.

TABLE 14. SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 0-250												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	334	0	0	1,966	34,488	36,002	39,304	16,901	51,458	48,473	52,963	50,358	15,049
1898	0	0	0	0	2,732	2,732	2,732	0	15,687	15,687	15,687	15,687	15,922
1899	0	0	0	0	0	0	0	0	10,463	10,463	10,463	10,463	15,922
1900	0	0	0	0	0	0	0	0	11,976	11,976	11,976	11,976	15,922
1901	491	0	0	0	15,717	43,170	47,822	0	41,389	45,763	50,570	50,570	15,922
1902	0	0	0	0	437	437	437	0	21,816	21,816	21,816	21,816	15,922
1903	319	0	0	0	33,345	36,819	36,823	4,235	35,014	35,899	35,899	50,037	15,922
1904	0	0	0	0	2,482	2,482	2,482	0	24,180	24,180	24,180	24,180	15,965
1905	312	0	0	0	15,912	0	0	20,865	26,053	26,638	26,638	29,862	10,469
1906	0	0	0	0	0	0	0	0	21,922	23,733	24,034	21,924	7,635
1907	813	984	320	1,103	0	0	0	0	19,494	25,222	34,569	20,105	5,280
1908	521	0	0	148	6,461	15,887	15,887	0	53,735	56,444	56,444	53,130	15,484
1909	16	16	0	0	29,885	0	0	21,613	43,763	32,207	34,916	46,321	12,127
1910	443	570	0	310	2,117	42,369	32,809	0	43,970	39,889	36,569	43,969	14,397
1911	0	0	36	79	85,892	0	0	0	59,261	23,992	30,924	22,485	6,413
1912	0	0	0	0	25,435	25,435	25,435	7,761	47,362	47,362	47,362	47,362	15,965
1913	0	0	0	0	9,481	9,481	9,481	0	40,386	40,386	40,386	40,386	15,922
1914	262	570	81	156	0	0	0	15,509	17,576	21,496	29,033	22,308	7,676
1915	403	0	0	199	27,352	18,246	18,979	19,211	54,447	37,123	37,384	59,693	13,960
1916	18	79	79	134	32,598	0	0	29,799	42,928	31,848	36,068	54,632	12,564
1917	823	0	0	558	11,487	20,698	20,698	0	55,310	60,160	60,160	54,615	15,006
1918	0	0	0	0	28,115	0	0	26,724	31,208	25,556	25,556	34,747	12,040
1919	0	0	0	0	0	0	0	0	37,874	37,874	37,874	37,874	15,922
1920	0	0	0	0	33,268	27,878	33,580	16,978	43,615	34,573	43,802	60,683	15,965
1921	342	0	0	16	18,143	18,143	18,143	606	50,697	53,411	54,013	50,396	15,398
1922	412	601	412	298	0	16,660	0	0	24,225	26,778	28,141	23,680	5,104
1923	1,219	0	0	610	1,199	13,714	13,714	0	47,709	51,298	51,298	47,445	15,224
1924	0	0	0	0	360	360	360	0	25,517	25,517	25,517	25,517	15,965
1925	0	0	0	0	1,411	1,411	1,411	0	21,878	21,878	21,878	21,878	15,922
[a]1926	0	0	0	0	17,286	16,852	17,722	0	20,986	20,924	21,049	40,320	11,909
Total	6,728	2,820	928	5,577	435,603	348,776	337,819	180,202	1,041,899	978,566	1,027,169	1,094,419	402,893
Average	226	95	31	188	14,642	11,724	11,355	6,057	35,021	32,893	34,526	36,788	13,543

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 250-500												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	771	0	0	10,201	0	3,302	0	0	903	4,490	0	2,003	785
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	8,201	0	0	0	0	4,652	0	0	4,252	4,807	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	989	0	0	0	16,402	18,866	18,862	0	14,421	14,138	14,138	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	0	0	0	0	54,770	100,310	100,310	33,664	33,520	35,949	35,949	31,219	5,235
1906	0	0	0	0	103,666	19,209	19,674	91,153	34,757	9,042	9,042	35,314	6,804
1907	3,411	3,411	1,142	2,696	20,515	19,650	0	49,281	12,451	11,450	905	23,442	4,100
1908	1,308	0	0	1,286	0	0	0	0	1,505	0	0	1,809	262
1909	4,489	1,246	0	4,553	19,583	97,859	110,956	10,506	22,612	38,088	37,185	20,355	3,011
1910	3,861	3,861	0	3,468	0	7,631	44,128	0	2,709	10,407	17,949	2,712	393
1911	1,152	1,596	373	634	0	94,422	0	70,041	903	23,290	301	37,981	8,070
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	1,541	1,539	293	1,994	71,219	119,650	0	39,392	40,108	40,106	302	35,980	6,195
1915	2,390	0	0	2,170	14,392	39,104	38,371	5,021	15,997	36,034	35,773	10,759	1,570
1916	0	1,262	200	468	21,495	101,945	17,933	6,825	21,662	36,055	2,122	9,958	1,484
1917	7,851	0	0	7,658	0	0	0	0	4,628	0	0	4,863	785
1918	0	0	0	0	0	76,848	76,848	22,293	0	33,185	33,185	23,391	3,795
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	18,681	24,071	18,369	0	17,068	26,110	16,881	0	0
1921	0	0	0	0	0	0	0	0	0	0	0	0	0
1922	1,029	1,071	2,338	955	93,935	37,518	0	77,275	44,976	18,990	1,810	44,977	8,071
1923	3,638	0	0	3,871	0	0	0	0	1,609	0	0	1,874	349
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	48,457	48,891	48,021	0	19,334	19,396	19,271	0	0
Total	40,631	13,986	4,346	39,954	483,115	813,928	493,472	405,451	293,415	361,537	224,813	286,637	50,909
Average	1,366	470	146	1,343	16,239	27,359	16,588	13,629	9,863	12,153	7,557	9,635	1,711

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 500-750												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	1,033	0	0	990	0	0	0	0	301	0	0	301	44
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	10,044	0	0	0	0	0	0	0	2,986	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	968	0	0	0	0	0	0	0	302	0	0	0	0
1906	0	0	0	0	16,772	141,904	144,307	14,756	6,859	34,380	34,380	6,601	960
1907	9,390	9,390	3,856	8,960	118,217	167,583	29,388	74,054	37,287	38,288	10,247	25,999	4,624
1908	0	0	0	1,064	0	0	0	0	0	0	0	301	44
1909	2,358	1,556	0	2,988	0	0	0	0	903	602	0	1,206	175
1910	2,832	2,835	0	2,705	0	0	0	0	903	903	0	904	131
1911	945	5,479	1,146	4,161	0	39,925	192,140	0	301	17,098	37,680	1,507	218
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	3,828	4,071	0	3,673	0	0	176,383	0	1,207	1,204	38,901	1,206	174
1915	1,754	0	0	1,682	0	0	0	0	602	0	0	601	87
1916	0	3,788	6,006	0	0	0	143,397	0	0	1,208	35,442	0	0
1917	793	0	0	2,248	0	0	0	0	222	0	0	682	131
1918	978	0	0	0	37,545	0	0	0	26,630	0	0	0	0
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0
1921	0	0	0	1,107	0	0	0	0	0	0	0	301	44
1922	4,619	6,080	6,141	5,696	0	88,065	201,811	0	1,508	25,841	46,181	1,749	262
1923	6,240	0	0	5,683	0	0	0	0	1,730	0	0	1,729	305
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	45,782	33,199	17,149	40,957	172,534	437,477	887,426	88,810	81,741	119,524	202,831	43,087	7,199
Average	1,539	1,116	577	1,377	5,800	14,705	29,829	2,985	2,748	4,017	6,817	1,448	242

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 750-1,000												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	0	0	0	0	0	0	0	0	0	0	0	0	0
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	6,946	0	0	0	0	0	0	0	1,339	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	1,241	0	0	0	0	0	0	0	301	0	0	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	1,573	0	0	1,520	0	0	0	0	301	0	0	301	44
1906	0	0	0	0	0	0	0	0	0	0	0	0	0
1907	11,494	8,693	1,257	13,220	0	0	217,284	0	2,410	1,808	35,578	2,713	393
1908	2,907	0	0	2,800	0	0	0	0	602	0	0	602	87
1909	0	1,438	0	1,427	0	0	0	0	0	301	0	301	44
1910	5,564	8,347	0	5,393	0	0	0	0	1,207	1,812	0	1,206	174
1911	0	3,834	4,825	0	0	0	0	0	0	903	904	0	0
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	4,068	7,138	0	3,740	0	0	0	0	906	1,505	0	904	131
1915	5,437	0	0	5,204	0	0	0	0	1,207	0	0	1,206	174
1916	1,249	1,235	4,142	0	0	0	0	0	301	302	903	0	0
1917	0	0	0	0	0	0	0	0	0	0	0	0	0
1918	0	0	0	0	0	0	0	0	0	0	0	0	0
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0
1921	0	0	0	0	0	0	0	0	0	0	0	0	0
1922	4,067	6,882	9,875	3,919	0	0	0	0	903	1,510	2,112	904	131
1923	0	0	0	0	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	44,546	37,567	20,099	37,223	0	0	217,284	0	9,477	8,141	39,497	8,137	1,178
Average	1,497	1,263	676	1,251	0	0	7,304	0	318	274	1,328	273	40

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 1,000-1,250												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	0	0	0	0	0	0	0	0	0	0	0	0	0
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	0	0	0	1,850	0	0	0	0	0	0	0	301	44
1906	0	0	0	0	2,139	0	0	0	301	0	0	0	0
1907	18,039	12,375	1,963	25,319	0	0	0	0	2,715	1,812	302	3,616	523
1908	0	0	0	2,136	0	0	0	0	0	0	0	301	44
1909	0	2,116	0	1,679	0	0	0	0	0	301	0	301	44
1910	3,937	5,845	0	1,741	0	0	0	0	604	903	0	301	44
1911	0	1,870	2,118	2,013	0	0	0	0	0	301	302	301	44
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	1,947	2,140	1,833	1,909	0	0	0	0	302	302	302	301	44
1915	5,844	0	0	3,959	0	0	0	0	904	0	0	601	87
1916	0	0	2,148	0	0	0	0	0	0	0	301	0	0
1917	0	0	0	0	0	0	0	0	0	0	0	0	0
1918	0	0	0	3,594	0	0	0	0	0	0	0	603	87
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0
1921	0	0	0	0	0	0	0	0	0	0	0	0	0
1922	2,614	2,065	1,828	0	0	0	0	0	301	301	301	0	0
1923	1,945	0	0	1,892	0	0	0	0	250	0	0	250	44
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34,326	26,411	9,890	46,092	2,139	0	0	0	5,377	3,920	1,508	6,876	1,005
Average	1,154	888	333	1,549	72	0	0	0	181	132	51	231	34

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"
Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.
Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 1,250-1,500												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	0	0	0	0	0	0	0	0	0	0	0	0	0
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	0	0	0	0	0	0	0	0	0	0	0	0	0
1906	0	0	0	0	0	0	0	0	0	0	0	0	0
1907	26,259	6,621	4,622	12,354	0	0	0	0	3,321	906	603	1,507	218
1908	2,235	0	0	0	0	0	0	0	301	0	0	0	0
1909	2,656	0	0	0	0	0	0	0	301	0	0	0	0
1910	0	2,516	0	0	0	0	0	0	0	302	0	0	0
1911	0	0	2,479	0	0	0	0	0	0	0	302	0	0
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	2,286	2,280	0	2,157	0	0	0	0	302	302	0	301	44
1915	0	0	0	0	0	0	0	0	0	0	0	0	0
1916	0	2,556	10,346	0	0	0	0	0	0	301	1,208	0	0
1917	0	0	0	0	0	0	0	0	0	0	0	0	0
1918	10,363	0	0	0	0	0	0	0	903	0	0	0	0
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0
1921	0	2,588	0	0	0	0	0	0	0	301	0	0	0
1922	0	5,069	2,614	4,861	0	0	0	0	0	602	301	603	87
1923	0	0	0	0	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	43,799	21,630	20,061	19,372	0	0	0	0	5,128	2,714	2,414	2,411	349
Average	1,472	727	674	651	0	0	0	0	172	91	81	81	12

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet: 1,500-1,900												
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	2,775	0	0	3,250	0	0	0	0	301	0	0	301	44
1898	0	0	0	0	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0	0	0	0	0
1901	7,012	0	0	0	0	0	0	0	604	0	0	0	0
1902	0	0	0	0	0	0	0	0	0	0	0	0	0
1903	3,496	0	0	0	0	0	0	0	301	0	0	0	0
1904	0	0	0	0	0	0	0	0	0	0	0	0	0
1905	27,143	0	0	10,287	0	0	0	0	2,411	0	0	904	130
1906	24303	2,864	0	23,964	17,495	0	0	17,292	3,617	301	0	3,617	523
1907	59,766	38,698	7,012	63,987	0	0	0	0	5,130	3,322	604	5,426	784
1908	2,787	0	0	2,725	0	0	0	0	301	0	0	301	44
1909	52,724	6,871	0	41,613	0	0	0	0	4,522	602	0	3,617	521
1910	59,635	3,298	0	61,545	0	0	0	0	5,125	302	0	5,426	783
1911	116,242	56,560	0	93,929	0	0	0	0	9,948	4,829	0	8,139	1,177
1912	0	0	0	0	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0	0	0	0	0
1914	140,645	87,839	46,064	132,093	0	0	0	0	12,055	7,541	3,918	11,456	1,658
1915	0	0	0	2,770	0	0	0	0	0	0	0	297	44
1916	150,880	94,784	20,783	151,716	0	0	0	0	12,961	8,138	1,808	13,262	1,917
1917	0	0	0	0	0	0	0	0	0	0	0	0	0
1918	0	0	0	0	0	0	0	0	0	0	0	0	0
1919	0	0	0	0	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0	0	0	0	0
1921	38,565	3,707	0	38,383	0	0	0	0	3,316	301	0	3,316	480
1922	181,940	156,682	101,380	179,792	0	0	0	0	15,674	13,565	8,741	15,674	2,267
1923	0	0	0	0	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	867,913	451,303	175,239	806,054	17,495	0	0	17,292	76,266	38,901	15,071	71,736	10,372
Average	29,174	15,170	5,890	27,095	588	0	0	581	2,564	1,307	507	2,411	348

[a] Partial year, January 1 to October 1.

TABLE 14 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS
OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. Maximum flood control reserve 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Size of total flow at Azusa in second-feet											
	Total											
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet				Seasonally stored water in acre-feet				Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet				Yield in a uniformly continuous flow equalized between seasons by over-year storage in acre-feet
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated	Flood control, seasonal and over-year storage coordinated
	[b]Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	[d f]180,000 acre-feet capacity	[c]Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	[e]180,000 acre-feet capacity	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity	180,000 acre-feet capacity

1897	4,913	0	0	16,407	34,488	39,304	39,304	16,901	52,963	52,963	52,963	52,963	15,922
1898	0	0	0	0	2,732	2,732	2,732	0	15,687	15,687	15,687	15,687	15,922
1899	0	0	0	0	0	0	0	0	10,463	10,463	10,463	10,463	15,922
1900	0	0	0	0	0	0	0	0	11,976	11,976	11,976	11,976	15,922
1901	32,694	0	0	0	15,717	47,822	47,822	0	50,570	50,570	50,570	50,570	15,922
1902	0	0	0	0	437	437	437	0	21,816	21,816	21,816	21,816	15,922
1903	6,045	0	0	0	49,747	55,685	55,685	4,235	50,037	50,037	50,037	50,037	15,922
1904	0	0	0	0	2,482	2,482	2,482	0	24,180	24,180	24,180	24,180	15,965
1905	29,996	0	0	13,657	70,682	100,310	100,310	54,529	62,587	62,587	62,587	62,587	15,922
1906	24,303	2,864	0	23,964	140,072	161,113	163,981	123,201	67,456	67,456	67,456	67,456	15,922
1907	129,172	80,172	20,172	127,639	138,732	187,233	246,672	123,335	82,808	82,808	82,808	82,808	15,922
1908	9,758	0	0	10,159	6,461	15,887	15,887	0	56,444	56,444	56,444	56,444	15,965
1909	62,243	13,243	0	52,260	49,468	97,859	110,956	32,119	72,101	72,101	72,101	72,101	15,922
1910	76,272	27,272	0	75,162	2,117	50,000	76,937	0	54,518	54,518	54,518	54,518	15,922
1911	118,339	69,339	10,977	100,816	85,892	134,347	192,140	70,041	70,413	70,413	70,413	70,413	15,922
1912	0	0	0	0	25,435	25,435	25,435	7,761	47,362	47,362	47,362	47,362	15,965
1913	0	0	0	0	9,481	9,481	9,481	0	40,386	40,386	40,386	40,386	15,922
1914	154,577	105,577	48,271	145,722	71,219	119,650	176,383	54,901	72,456	72,456	72,456	72,456	15,922
1915	15,828	0	0	15,984	41,744	57,350	57,350	24,232	73,157	73,157	73,157	73,157	15,922
1916	152,147	103,704	43,704	152,318	54,093	101,945	161,330	36,624	77,852	77,852	77,852	77,852	15,965
1917	9,467	0	0	10,464	11,487	20,698	20,698	0	60,160	60,160	60,160	60,160	15,922
1918	11,341	0	0	3,594	65,660	76,848	76,848	49,017	58,741	58,741	58,741	58,741	15,922
1919	0	0	0	0	0	0	0	0	37,874	37,874	37,874	37,874	15,922
1920	0	0	0	0	51,949	51,949	51,949	16,978	60,683	60,683	60,683	60,683	15,965
1921	38,907	6,295	0	39,506	18,143	18,143	18,143	606	54,013	54,013	54,013	54,013	15,922
1922	194,681	178,450	124,588	195,521	93,935	142,243	201,811	77,275	87,587	87,587	87,587	87,587	15,922
1923	13,042	0	0	12,056	1,199	13,714	13,714	0	51,298	51,298	51,298	51,298	15,922
1924	0	0	0	0	360	360	360	0	25,517	25,517	25,517	25,517	15,965
1925	0	0	0	0	1,411	1,411	1,411	0	21,878	21,878	21,878	21,878	15,922
[a]1926	0	0	0	0	65,743	65,743	65,743	0	40,320	40,320	40,320	40,320	11,909
Total	1,083,725	586,916	247,712	995,229	1,110,886	1,600,181	1,936,001	691,755	1,513,303	1,513,303	1,513,303	1,513,303	473,905
Average	36,428	19,729	8,327	33,454	37,341	53,788	65,076	23,252	50,867	50,867	50,867	50,867	15,930

[a] Partial year, January 1 to October 1.

[b] The aggregate of the entries in this column is smaller than the corresponding entries in the summary table page **146**, and Tables 12 and 12a, from which it is derived, by an average of about 700 acre-feet per season. This water was released in controlling floods during April, 1906, total amount 19,600 acre-feet, but was included in seasonally stored water in preparing this table.

[c] The aggregate of the entries in this column is larger than the corresponding entries in the summary table page **146** and Tables 12 and 12a, from which it is derived, by an average of about 700 acre-feet per season. This water was released in controlling floods during April, 1906, total amount 19,600 acre-feet, but was included in seasonally stored water in preparing this table.

[d] The aggregate of the entries in this column is smaller than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in seasonally stored water in preparing this table.

[e] The aggregate of the entries in this column is larger than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in the seasonally stored water in preparing this table.

[f] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

TABLE 14 (Concluded). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD UNDER "COORDINATED PLAN"

Yearly Summary of Computations Carried out on a Daily Basis.

Maximum controlled flow at Azusa 1,900 second-feet. **Maximum flood control reserve 131,000 acre-feet.**

Natural flow up to 152 second-feet passed for prior rights.

Reservoir emptied of seasonal storage each year.

Year	Grand total in acre-feet				Year	Grand totalin acre-feet			
	Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated		Flood control and seasonal storage coordinated			Flood control, seasonal and over-year storage coordinated
	Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	180,000 acre-feet capacity		Maximum flood control reserve or first 131,000 acre-feet of capacity	180,000 acre-feet capacity	240,000 acre-feet capacity	[b]180,000 acre-feet capacity
1897	92,364	92,267	92,267	102,193	1914	298,252	297,683	297,110	289,001
1898	18,419	18,419	18,419	31,609	1915	130,729	130,507	130,507	129,295
1899	10,463	10,463	10,463	26,385	1916	284,092	283,501	282,886	282,759
1900	11,976	11,976	11,976	27,898	1917	81,114	80,858	80,858	86,546
1901	98,981	98,392	98,392	66,492	1918	135,742	135,589	135,589	127,274
1902	22,253	22,253	22,253	37,738	1919	37,874	37,874	37,874	53,796
1903	105,829	105,722	105,722	70,194	1920	112,632	112,632	112,632	93,626
1904	26,662	26,662	26,662	40,145	1921	111,063	78,451	72,156	110,047
1905	163,265	162,897	162,897	146,695	1922	376,203	408,280	413,986	376,305
1906	231,831	231,433	231,437	230,543	1923	65,539	65,012	65,012	79,276
1907	350,712	350,213	349,652	349,704	1924	25,877	25,877	25,877	41,482
1908	72,663	72,331	72,331	82,568	1925	23,289	23,289	23,289	37,800
1909	183,812	183,203	183,057	172,402	[a]1926	106,063	106,063	106,063	52,229
1910	132,907	131,790	131,455	145,602					
1911	274,644	274,099	273,530	257,192	Total	3,707,914	3,700,400	3,697,016	3,674,192
1912	72,797	72,797	72,797	71,088	Average	124,636	124,384	124,270	123,503
1913	49,867	49,867	49,867	56,308	Average evaporation	809	1,061	1,175	2,198
					Average total flow	125,445	125,445	125,445	125,701

[a] Partial year, January 1 to October 1.

[b] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

TABLE 15. SAN GABRIEL RESER
COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Yearly Summary of Computations
(For corresponding monthly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 sec.-ft. maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1897	96,270	62,650	52,963	16,407	15,922	16,901	2,466	0
1898	15,687	54,261	15,687	0	15,922	0	1,926	0
1899	10,463	36,413	10,463	0	15,922	0	1,448	0
1900	21,986	19,043	11,976	0	15,922	0	796	0
1901	89,560	12,335	50,570	0	15,922	0	1,846	0
1902	22,314	33,557	21,816	0	15,922	0	1,374	0
1903	106,985	16,759	50,037	0	15,922	4,235	2,293	0
1904	26,836	51,257	24,180	0	15,965	0	1,922	0
1905	164,715	36,026	62,587	13,658	15,922	54,528	2,781	0
1906	241,430	51,265	67,456	39,397	15,922	107,768	3,189	0
1907	345,320	58,963	82,808	127,639	15,922	123,335	3,301	0
1908	72,950	51,278	56,444	10,159	15,965	0	2,012	0
1909	199,540	39,648	72,101	52,260	15,922	32,119	2,593	0
1910	118,450	64,193	54,518	75,162	15,922	0	1,892	0
1911	276,280	35,149	70,413	100,816	15,922	70,041	2,916	0
1912	73,620	51,321	47,362	0	15,965	7,761	2,356	0
1913	50,323	51,497	40,386	0	15,922	0	2,099	0
1914	299,710	43,413	72,456	145,722	15,922	54,901	2,785	0
1915	131,800	51,337	73,157	15,984	15,922	24,232	2,514	0
1916	294,220	51,328	77,852	152,317	15,965	36,625	2,625	0
1917	72,710	60,164	60,160	10,464	15,922	0	2,122	0
1918	137,140	44,206	58,741	3,595	15,922	49,016	2,741	0
1919	38,005	51,331	37,874	0	15,922	0	1,848	0
1920	113,730	33,692	60,683	0	15,965	16,978	2,454	0
1921	186,760	51,342	54,013	39,506	15,922	606	2,269	0
1922	316,690	125,786	87,587	195,520	15,922	77,276	2,970	0
1923	51,750	63,201	51,298	12,056	15,922	0	1,858	0
1924	25,933	33,817	25,517	0	15,965	0	1,380	0
1925	23,400	16,888	21,878	0	15,922	0	744	0
[a]1926	107,400	1,744	40,320	0	11,909	0	1,866	0
Total	3,731,977		1,513,303	[b]1,010,662	473,905	676,322	65,386	0
Average	125,445		50,867	[b]33,972	15,930	22,734	2,198	

[a] Partial year, January 1 to October 1.

[b] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

VOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL

AND OVER-YEAR STORAGE.

Carried out on a Daily Basis.

mary, see Table 15a, page 404.)

Maximum controlled flow at Azusa 1900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 ac.-ft.) in reserve throughout flood season. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 sec.-ft. maintained, other drafts only as required by reservoir operating diagram							
Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year
49,122	52,963	33,933	13,032	0	2,006	0	1897
43,458	15,687	0	13,032	0	1,688	0	1898
28,738	10,463	0	13,032	0	1,263	0	1899
14,443	11,976	0	13,032	0	644	0	1900
10,777	50,570	0	13,032	0	1,854	0	1901
34,881	21,816	0	13,032	0	1,463	0	1902
20,884	50,037	11,429	13,032	4,588	2,186	0	1903
46,597	24,180	0	13,068	0	1,836	0	1904
34,349	62,587	73,010	13,032	1,734	2,140	0	1905
46,561	67,456	136,655	13,032	19,376	2,350	0	1906
49,122	82,808	228,430	13,032	21,229	2,352	0	1907
46,591	56,444	10,356	13,068	0	1,928	0	1908
37,745	72,101	91,415	13,032	2,644	2,165	0	1909
55,928	54,518	68,002	13,032	0	1,911	0	1910
36,915	70,413	176,382	13,032	4,617	2,194	0	1911
46,557	47,362	13,060	13,068	0	2,082	0	1912
44,605	40,386	2,687	13,032	0	1,909	0	1913
36,914	72,456	197,801	13,032	4,554	2,176	0	1914
46,605	73,157	35,855	13,032	7,618	2,201	0	1915
46,542	77,852	198,835	13,068	0	2,028	0	1916
48,979	60,160	8,027	13,032	0	1,946	0	1917
38,524	58,741	60,968	13,032	0	2,000	0	1918
40,923	37,874	0	13,032	0	1,623	0	1919
26,399	60,683	20,118	13,068	0	2,068	0	1920
44,192	54,013	46,345	13,032	352	2,108	0	1921
115,102	87,587	259,909	13,032	19,973	2,328	0	1922
48,963	51,298	0	13,032	0	1,850	0	1923
34,533	25,517	0	13,068	0	1,453	0	1924
20,428	21,878	0	13,032	0	1,010	0	1925
7,908	40,320	11,836	9,747	1,088	1,772	0	[a]1926
	1,513,303	1,685,053	387,891	[c]87,773	56,534	0	Total
	50,867	56,641	13,039	[c]2,950	1,900		Average

[c] In the computations for this table, the period of analysis closed with 1423 acre-feet more water in storage than at the beginning, the equivalent of 48 acre-feet per season. Since in the computations this water was stored in the last year of the period of analysis, the exact yield in seasonally stored water for the period is larger than here shown by this amount.

TABLE 16. SAN GABRIEL RESER

COMPARISON OF WATER YIELD FOR THE USE OF

Yearly Summary of Computations

(For corresponding monthly sum

Natural flow up to 152 second-

Height of dam 383 feet.

Capacity of reservoir 180,000 acre-feet.

Year	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram: Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Flood control partially coordinated. Constant draft of 22 sec.-ft. maintained, required by reservoir: Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet
1897	96,270	62,650	52,963	30,209	2,830	0	62,650	52,963	16 407	15,922
1898	15,687	72,918	15,687	13,484	2,273	0	70,937	15,687	10,849	15,922
1899	10,463	57,161	10,463	0	2,219	0	42,090	10,463	0	15,922
1900	21,986	54,942	11,976	0	2,166	0	24,561	11,976	0	15,922
1901	89,560	62,786	50,570	36,470	2,405	0	17,571	50,570	0	15,922
1902	22,314	62,901	21,816	0	2,357	0	38,663	21,816	0	15,922
1903	106,985	61,042	50,037	18,087	3,100	0	21,716	50,037	0	15,922
1904	26,836	96,803	24,180	0	3,157	0	60,266	24,180	0	15,965
1905	164,715	96,302	62,587	99,337	3,569	0	44,803	62,587	32,989	15,922
1906	241,430	95,524	67,456	201,800	4,497	0	94,565	67,456	184,996	15,922
1907	345,320	63,201	82,808	212,060	4,663	7,426	63,201	82,808	201,165	15,922
1908	72,950	101,564	56,444	62,322	2,245	0	100,648	56,444	59,529	15,965
1909	199,540	53,503	72,101	104,979	3,124	0	39,648	72,101	75,341	15,922
1910	118,450	72,839	54,518	85,557	2,072	0	72,839	54,518	83,808	15,922
1911	276,280	49,142	70,413	153,559	3,871	0	35,149	70,413	124,229	15,922
1912	73,620	97,579	47,362	11,255	3,573	0	97,099	47,362	496	15,965
1913	50,323	109,009	40,386	47,834	2,546	0	103,463	40,386	39,563	15,922
1914	299,710	68,566	72,456	227,682	3,549	0	55,522	72,456	198,812	15,922
1915	131,800	64,589	73,157	31,417	2,967	0	64,589	73,157	29,236	15,922
1916	294,220	88,848	77,852	238,753	3,262	0	75,288	77,852	209,378	15,965
1917	72,710	63,201	60,160	14,791	2,302	0	63,201	60,160	13,501	15,922
1918	137,140	58,658	58,741	61,007	3,529	0	44,206	58,741	31,054	15,922
1919	38,005	72,521	37,874	7,081	2,568	0	72,261	37,874	0	15,922
1920	113,730	63,003	60,683	41,059	3,263	0	54,111	60,683	16,619	15,965
1921	186,760	71,728	54,013	62,355	2,484	0	71,466	54,013	60,199	15,922
1922	316,690	139,636	87,587	301,585	3,953	0	125,786	87,587	271,925	15,922
1923	51,750	63,201	51,298	13,408	2,048	0	63,201	51,298	12,056	15,922
1924	25,933	48,197	25,517	0	2,012	0	33,817	25,517	0	15,965
1925	23,400	46,601	21,878	0	1,984	0	16,888	21,878	0	15,922
[a]1926	107,400	46,139	40,320	0	2,842	0	1,744	40,320	0	11,909
Total	3,731,977		1,513,303	[b]2,076,091	87,430	7,426		1,513,303	[c]1,672,152	473,905
Average	125,445		50,867	[b]69,785	2,939	250		50,867	[c]56,207	15,930

[a] Partial year, January 1 to October 1.

[b] In the computations for this table, the period of analysis closed with 47,727 acre-feet more water in storage than at the beginning, the equivalent of 1604 acre-feet per season. Since in the computations this water was stored in the last year of the period of analysis, the exact yield of flood control water for the period is greater than here shown by this amount.

VOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING RESERVOIR SPACE.

Carried out on a Daily Basis.

mary, see Table 16a, page 426.)

feet passed for prior rights.

Maximum controlled flow at Azusa 1900 second-feet.

Maximum flood control reserve 131,000 acre-feet.

with conservation other drafts only as operating diagram		**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 sec.-ft. maintained, other drafts only as required by reservoir operating diagram							
Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonal storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year
2,691	0	62,650	52,963	16,407	15,922	16,901	2,466	0	1897
2,076	0	54,261	15,687	0	15,922	0	1,926	0	1898
1,607	0	36,413	10,463	0	15,922	0	1,448	0	1899
1,078	0	19,043	11,976	0	15,922	0	796	0	1900
1,976	0	12,335	50,570	0	15,922	0	1,846	0	1901
1,523	0	33,557	21,816	0	15,922	0	1,374	0	1902
2,476	0	16,759	50,037	0	15,922	4,235	2,293	0	1903
2,154	0	51,257	24,180	0	15,965	0	1,922	0	1904
3,455	0	36,026	62,587	13,658	15,922	54,528	2,781	0	1905
4,420	0	51,265	67,456	39,397	15,922	107,768	3,189	0	1906
4,627	3,351	58,963	82,808	127,639	15,922	123,335	3,301	0	1907
2,012	0	51,278	56,444	10,159	15,965	0	2,012	0	1908
2,985	0	39,648	72,101	52,260	15,922	32,119	2,593	0	1909
1,892	0	64,193	54,518	75,162	15,922	0	1,892	0	1910
3,766	0	35,149	70,413	100,816	15,922	70,041	2,916	0	1911
3,433	0	51,321	47,362	0	15,965	7,761	2,356	0	1912
2,393	0	51,497	40,386	0	15,922	0	2,099	0	1913
3,453	0	43,413	72,456	145,722	15,922	54,901	2,785	0	1914
2,786	0	51,337	73,157	15,984	15,922	24,232	2,514	0	1915
3,112	0	51,328	77,852	152,317	15,965	36,625	2,625	0	1916
2,122	0	60,164	60,160	10,464	15,922	0	2,122	0	1917
3,368	0	44,206	58,741	3,595	15,922	49,016	2,741	0	1918
2,359	0	51,331	37,874	0	15,922	0	1,848	0	1919
3,108	0	33,692	60,683	0	15,965	16,978	2,454	0	1920
2,306	0	51,342	54,013	39,506	15,922	606	2,269	0	1921
3,841	0	125,786	87,587	195,520	15,922	77,276	2,970	0	1922
1,858	0	63,201	51,298	12,056	15,922	0	1,858	0	1923
1,380	0	33,817	25,517	0	15,965	0	1,380	0	1924
744	0	16,888	21,878	0	15,922	0	744	0	1925
1,866	0	1,744	40,320	0	11,909	0	1,866	0	[a]1926
76,867	3,351		1,513,303	[c]1,010,662	473,905	676,322	65,386	0	Total
2,584	113		50,867	[c]33,972	15,930	22,734	2,198	0	Average

[c] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

TABLE 17. SAN GABRIEL RESER

COMPARISON OF WATER YIELD FOR OPERATING FOR FLOOD CONTROL

Yearly Summary of Computations

(For corresponding monthly sum

Natural flow up to 152 second-

Maximum controlled flow at Azusa 1900 second-feet.

Year	Run-off at Azusa in acre-feet	Height of dam 383 feet. Capacity of reservoir 180,000 ac.-ft. Constant draft of 22 sec.-ft. maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1897	96,270	62,650	52,963	16,407	15,922	2,691	0
1898	15,687	70,937	15,687	10,849	15,922	2,076	0
1899	10,463	42,090	10,463	0	15,922	1,607	0
1900	21,986	24,561	11,976	0	15,922	1,078	0
1901	89,560	17,571	50,570	0	15,922	1,976	0
1902	22,314	38,663	21,816	0	15,922	1,523	0
1903	106,985	21,716	50,037	0	15,922	2,476	0
1904	26,836	60,266	24,180	0	15,965	2,154	0
1905	164,715	44,803	62,587	32,989	15,922	3,455	0
1906	241,430	94,565	67,456	184,996	15,922	4,420	0
1907	345,320	63,201	82,808	201,165	15,922	4,627	3,351
1908	72,950	100,648	56,444	59,529	15,965	2,012	0
1909	199,540	39,648	72,101	75,341	15,922	2,985	0
1910	118,450	72,839	54,518	83,808	15,922	1,892	0
1911	276,280	35,149	70,413	124,229	15,922	3,766	0
1912	73,620	97,099	47,362	496	15,965	3,433	0
1913	50,323	103,463	40,386	39,563	15,922	2,393	0
1914	299,710	55,522	72,456	198,812	15,922	3,453	0
1915	131,800	64,589	73,157	29,236	15,922	2,786	0
1916	294,220	75,288	77,852	209,378	15,965	3,112	0
1917	72,710	63,201	60,160	13,501	15,922	2,122	0
1918	137,140	44,206	58,741	31,054	15,922	3,368	0
1919	38,005	72,261	37,874	0	15,922	2,359	0
1920	113,730	54,111	60,683	16,619	15,965	3,108	0
1921	186,760	71,466	54,013	60,199	15,922	2,306	0
1922	316,690	125,786	87,587	271,925	15,922	3,841	0
1923	51,750	63,201	51,298	12,056	15,922	1,858	0
1924	25,933	33,817	25,517	0	15,965	1,380	0
1925	23,400	16,888	21,878	0	15,922	744	0
[a]1926	107,400	1,744	40,320	0	11,909	1,866	0
Total	3,731,977		1,513,303	[b]1,672,152	473,905	76,867	3,351
Average	125,445		50,867	[b]56,207	15,930	2,584	113

[a] Partial year, January 1 to October 1.

[b] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

VOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR
AND CONSTANT DRAFT ONLY.

Carried out on a Daily Basis.

mary, see Table 17a, page 448.)

feet passed for prior rights.

Maximum flood control reserve 131,000 acre-feet.

Height of dam 425 feet — **Capacity of reservoir 240,000 ac.-ft.**

Constant draft of 41 sec.-ft. maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of year in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year
122,650	52,963	15,089	29,672	3,802	0	1897
117,394	15,687	0	29,672	3,170	0	1898
84,552	10,463	0	29,672	2,461	0	1899
52,419	11,976	0	29,672	1,677	0	1900
31,080	50,570	0	29,672	2,116	0	1901
38,282	21,816	0	29,672	1,269	0	1902
7,839	50,037	0	29,672	1,959	0	1903
33,156	24,180	0	29,754	1,168	0	1904
4,890	62,587	0	29,672	2,931	0	1905
74,415	67,456	90,216	29,672	5,300	0	1906
123,201	82,808	190,451	29,672	5,733	0	1907
159,857	56,444	57,178	29,754	3,216	0	1908
86,215	72,101	47,055	29,672	4,088	0	1909
132,839	54,518	82,307	29,672	3,114	0	1910
81,678	70,413	96,025	29,672	4,819	0	1911
157,029	47,362	0	29,754	4,471	0	1912
149,062	40,386	24,723	29,672	3,529	0	1913
101,075	72,456	169,521	29,672	4,543	0	1914
124,593	73,157	27,425	29,672	3,903	0	1915
122,236	77,852	181,433	29,754	4,216	0	1916
123,201	60,160	12,270	29,672	3,308	0	1917
90,501	58,741	2,982	29,672	4,212	0	1918
132,034	37,874	0	29,672	3,481	0	1919
99,012	60,683	0	29,754	3,860	0	1920
118,445	54,013	35,443	29,672	3,457	0	1921
182,620	87,587	253,954	29,672	4,896	0	9122
123,201	51,298	10,928	29,672	3,084	0	1923
79,969	25,517	0	29,754	2,376	0	1924
48,255	21,878	0	29,672	1,601	0	1925
18,504	40,320	0	22,193	2,054	0	[a]1926
	1,513,303	1,297,000	[c]883,173	99,814	0	Total
	50,867	[c]43,597	[c]29,686	3,355	0	Average

[c] These figures contain 61,313 acre-feet total or an average of 2060 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. A supplementary analysis, having the same amount of water in storage at the beginning and at the end of the period, was made to obtain the exact yield for the period. This gave 47,900 and 23,300 acre-feet per season, respectively, for the flood control wate rand uniformly continuous flow instead of 43,597 and 29,686 acre-feet, respectively, that are shown herein.

TABLE 18. SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 0-250								
	Flood control alone Water drawn from reservoir only as required by reservoir operating diagram			**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	4,122	0	0	1,966	0	15,049	1,966	16,901	15,049
1898	191	0	0	107	0	15,747	0	0	15,922
1899	0	0	0	0	0	15,922	0	0	15,922
1900	0	0	0	0	0	15,922	0	0	15,922
1901	889	0	0	0	0	15,922	0	0	15,922
1902	0	0	0	0	0	15,922	0	0	15,922
1903	1,808	0	0	0	0	15,922	0	4,235	15,922
1904	0	0	0	0	0	15,965	0	0	15,965
1905	513	0	0	401	0	15,137	0	20,865	10,469
1906	591	0	0	688	0	13,391	0	0	7,635
1907	4,590	0	0	2,251	0	10,950	1,103	0	5,280
1908	62	0	0	23	0	15,179	148	0	15,484
1909	1,409	0	0	88	0	14,003	0	21,613	12,127
1910	445	0	0	310	0	14,307	310	0	14,397
1911	1,342	0	0	261	0	14,046	79	0	6,413
1912	161	0	0	143	0	15,921	0	7,761	15,965
1913	0	0	0	12	0	15,311	0	0	15,922
1914	477	0	0	151	0	12,694	156	15,509	7,676
1915	597	0	0	324	0	15,182	199	19,211	13,960
1916	14	0	0	0	0	12,563	134	29,799	12,564
1917	793	0	0	0	0	15,398	558	0	15,006
1918	209	0	0	78	0	14,831	0	26,724	12,040
1919	137	0	0	0	0	15,922	0	0	15,922
1920	2,341	0	0	1,375	0	15,485	0	16,978	15,965
1921	0	0	0	0	0	15,092	16	606	15,398
1922	307	0	0	225	0	11,342	298	0	5,104
1923	984	0	0	610	0	15,224	610	0	15,224
1924	0	0	0	0	0	15,965	0	0	15,965
1925	0	0	0	0	0	15,922	0	0	15,922
[a]1926	0	0	0	0	0	11,909	0	0	11,909
Total	21,982	0	0	9,013	0	442,145	5,577	180,202	402,893
Average	739	0	0	303	0	14,862	188	6,057	13,543

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 250-500								
	Flood control alone Water drawn from reservoir only as required by reservoir operating diagram			**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	12,490	0	0	10,201	0	785	10,201	0	785
1898	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	8,976	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	952	0	0	1,699	0	174	0	33,564	5,235
1906	2,815	0	0	2,679	0	174	0	91,153	6,804
1907	10,817	0	0	7,472	0	1,090	2,696	49,281	4,100
1908	0	0	0	566	0	44	1,286	0	262
1909	2,624	0	0	4,553	0	524	4,553	10,506	3,011
1910	3,861	0	0	3,468	0	393	3,468	0	393
1911	1,156	0	0	634	0	87	634	70,041	8,070
1912	0	0	0	353	0	44	0	0	0
1913	0	0	0	1,191	0	131	0	0	0
1914	4,524	0	0	5,633	0	480	1,994	39,392	6,195
1915	2,581	0	0	2,186	0	218	2,170	5,021	1,570
1916	3,074	0	0	2,304	0	174	468	6,825	1,484
1917	8,843	0	0	8,589	0	262	7,658	0	785
1918	2,197	0	0	2,149	0	175	0	22,293	3,795
1919	1,586	0	0	0	0	0	0	0	0
1920	11,700	0	0	3,424	0	218	0	0	0
1921	0	0	0	352	0	44	0	0	0
1922	2,899	0	0	2,714	0	218	955	77,275	8,071
1923	4,220	0	0	3,871	0	349	3,871	0	349
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	85,315	0	0	64,338	0	5,584	39,954	405,451	50,909
Average	2,868	0	0	2,162	0	188	1,343	13,629	1,711

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 500-750								
	Flood control alone Water drawn from reservoir only as required by reservoir operating diagram			**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	3,366	0	0	990	0	44	990	0	44
1898	0	0	0	1,316	0	44	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	11,032	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	2,133	0	0	1,345	0	44	0	0	0
1906	3,195	0	0	3,177	0	131	0	14,756	960
1907	14,447	0	0	13,749	0	654	8,960	74,054	4,624
1908	0	0	0	0	0	0	1,064	0	44
1909	3,735	0	0	6,253	0	305	2,988	0	175
1910	2,833	0	0	2,705	0	131	2,705	0	131
1911	5,594	0	0	5,907	0	305	4,161	0	218
1912	0	0	0	0	0	0	0	0	0
1913	823	0	0	0	0	0	0	0	0
1914	4,869	0	0	5,780	0	262	3,673	0	174
1915	1,816	0	0	2,200	0	87	1,682	0	87
1916	15,131	0	0	14,527	0	611	0	0	0
1917	5,155	0	0	4,912	0	262	2,248	0	131
1918	13,094	0	0	11,619	0	480	0	0	0
1919	5,358	0	0	0	0	0	0	0	0
1920	8,181	0	0	3,402	0	131	0	0	0
1921	878	0	0	0	0	0	1,107	0	44
1922	5,753	0	0	8,547	0	392	5,696	0	262
1923	6,225	0	0	5,683	0	305	5,683	0	305
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	113,618	0	0	92,112	0	4,188	40,957	88,810	7,199
Average	3,819	0	0	3,096	0	141	1,377	2,985	242

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 750-1,000 — Flood control alone (Water drawn from reservoir only as required by reservoir operating diagram)			Flood control partially coordinated with conservation (Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)			Flood control completely coordinated with conservation (Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	1,783	0	0	0	0	0	0	0	0
1898	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	5,590	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	3,360	0	0	10,971	0	305	1,520	0	44
1906	3,183	0	0	4,145	0	131	0	0	0
1907	17,511	0	0	16,833	0	524	13,220	0	393
1908	0	0	0	0	0	0	2,800	0	87
1909	11,714	0	0	10,091	0	305	1,427	0	44
1910	4,034	0	0	3,903	0	131	5,393	0	174
1911	1,563	0	0	0	0	0	0	0	0
1912	0	0	0	0	0	0	0	0	0
1913	1,501	0	0	0	0	0	0	0	0
1914	0	0	0	2,504	0	87	3,740	0	131
1915	6,824	0	0	5,204	0	174	5,204	0	174
1916	16,279	0	0	9,467	0	305	0	0	0
1917	0	0	0	0	0	0	0	0	0
1918	16,235	0	0	7,715	0	218	0	0	0
1919	0	0	0	0	0	0	0	0	0
1920	9,715	0	0	1,546	0	44	0	0	0
1921	1,436	0	0	1,215	0	44	0	0	0
1922	24,377	0	0	24,627	0	742	3,919	0	131
1923	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	125,105	0	0	98,221	0	3,010	37,223	0	1,178
Average	4,205	0	0	3,302	0	101	1,251	0	40

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 1,000-1,250 — Flood control alone (Water drawn from reservoir only as required by reservoir operating diagram)			Flood control partially coordinated with conservation (Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)			Flood control completely coordinated with conservation (Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	2,181	0	0	0	0	0	0	0	0
1898	2,199	0	0	2,136	0	44	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	0	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	8,014	0	0	1,923	0	44	1,850	0	44
1906	2,182	0	0	2,238	0	44	0	0	0
1907	42,477	0	0	41,522	0	916	25,319	0	523
1908	0	0	0	0	0	0	2,136	0	44
1909	9,501	0	0	9,302	0	218	1,679	0	44
1910	1,802	0	0	1,758	0	44	1,741	0	44
1911	6,102	0	0	2,013	0	44	2,013	0	44
1912	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0
1914	0	0	0	5,845	0	131	1,909	0	44
1915	2,059	0	0	2,014	0	43	3,959	0	87
1916	6,170	0	0	4,061	0	87	0	0	0
1917	0	0	0	0	0	0	0	0	0
1918	11,795	0	0	9,493	0	218	3,594	0	87
1919	0	0	0	0	0	0	0	0	0
1920	2,182	0	0	0	0	0	0	0	0
1921	0	0	0	0	0	0	0	0	0
1922	20,396	0	0	17,755	0	392	0	0	0
1923	1,979	0	0	1,892	0	44	1,892	0	44
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	119,039	0	0	101,952	0	2,269	46,092	0	1,005
Average	4,001	0	0	3,427	0	76	1,549	0	34

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 1,250-1,500								
	Flood control alone Water drawn from reservoir only as required by reservoir operating diagram			**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Constant flow from over-year storage in acre-feet
1897	0	0	0	0	0	0	0	0	0
1898	0	0	0	0	0	0	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	0	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	2,255	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	0	0	0	0	0	0	0	0	0
1906	0	0	0	2,957	0	44	0	0	0
1907	46,603	0	0	43,615	0	785	12,354	0	218
1908	2,576	0	0	0	0	0	0	0	0
1909	2,404	0	0	0	0	0	0	0	0
1910	2,435	0	0	2,391	0	44	0	0	0
1911	0	0	0	0	0	0	0	0	0
1912	0	0	0	0	0	0	0	0	0
1913	0	0	0	0	0	0	0	0	0
1914	2,284	0	0	4,890	0	87	2,157	0	44
1915	0	0	0	0	0	0	0	0	0
1916	8,806	0	0	2,334	0	44	0	0	0
1917	0	0	0	0	0	0	0	0	0
1918	0	0	0	0	0	0	0	0	0
1919	0	0	0	0	0	0	0	0	0
1920	0	0	0	0	0	0	0	0	0
1921	0	0	0	0	0	0	0	0	0
1922	14,287	0	0	11,906	0	218	4,861	0	87
1923	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	81,650	0	0	68,093	0	1,222	19,372	0	349
Average	2,745	0	0	2,289	0	41	651	0	12

[a] Partial year, January 1 to October 1.

TABLE 18 (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.
Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: 1,500-1,900 — Flood control alone (Water drawn from reservoir only as required by reservoir operating diagram)			Flood control partially coordinated with conservation (Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)			Flood control completely coordinated with conservation (Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram)		
	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre feet	Constant flow from over year storage in acre feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre feet	Constant flow from over-year storage in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre feet	Constant flow from over year storage in acre-feet
1897	6,267	0	0	3,250	0	44	3,250	0	44
1898	11,094	0	0	7,290	0	87	0	0	0
1899	0	0	0	0	0	0	0	0	0
1900	0	0	0	0	0	0	0	0	0
1901	9,983	0	0	0	0	0	0	0	0
1902	0	0	0	0	0	0	0	0	0
1903	14,024	0	0	0	0	0	0	0	0
1904	0	0	0	0	0	0	0	0	0
1905	84,365	0	0	16,650	0	218	10,287	0	130
1906	189,834	0	0	169,112	0	2,007	23,964	17,292	523
1907	83,041	0	0	78,774	0	1,003	63,987	0	784
1908	59,684	0	0	58,940	0	742	2,725	0	44
1909	73,592	0	0	45,054	0	567	41,613	0	521
1910	70,147	0	0	69,273	0	872	61,545	0	783
1911	137,802	0	0	115,414	0	1,440	93,929	0	1,177
1912	11,094	0	0	0	0	0	0	0	0
1913	45,510	0	0	38,360	0	480	0	0	0
1914	215,528	0	0	174,009	0	2,181	132,093	0	1,658
1915	17,540	0	0	17,308	0	218	2,770	0	44
1916	189,279	0	0	176,685	0	2,181	151,716	0	1,917
1917	0	0	0	0	0	0	0	0	0
1918	17,477	0	0	0	0	0	0	0	0
1919	0	0	0	0	0	0	0	0	0
1920	6,940	0	0	6,872	0	87	0	0	0
1921	60,041	0	0	58,632	0	742	38,383	0	480
1922	233,566	0	0	206,151	0	2,618	179,792	0	2,267
1923	0	0	0	0	0	0	0	0	0
1924	0	0	0	0	0	0	0	0	0
1925	0	0	0	0	0	0	0	0	0
[a]1926	0	0	0	0	0	0	0	0	0
Total	1,536,808	0	0	1,241,774	0	15,487	806,054	17,292	10,372
Average	51,658	0	0	41,741	0	521	27,095	581	348

[a] Partial year, January 1 to October 1.

TABLE 18. (Continued). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.

Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet: Total, 0–1900											
	Flood Control Alone Water drawn from reservoir only as required by reservoir operating diagram				**Flood control partially coordinated with conservation** Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram				**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period, constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram			
	[b]Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet	Constant flow from over-year storage in acre-feet	[c]Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water released as a variable summer flow in acre-feet	Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet	Constant flow from over-year storage in acre-feet	[d e]Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	[f]Seasonally stored water released as a variable summer flow in acre-feet	Aggregate of natural flow up to 152 second-feet passed for prior rights in acre-feet	Constant flow from over-year storage in acre-feet
1897	30,209	0	52,963	0	16,407	0	52,963	15,922	16,407	16,901	52,963	15,922
1898	13,484	0	15,687	0	10,849	0	15,687	15,922	0	0	15,687	15,922
1899	0	0	10,463	0	0	0	10,463	15,922	0	0	10,463	15,922
1900	0	0	11,976	0	0	0	11,976	15,922	0	0	11,976	15,922

1901	36,470	0	50,570	0	0	0	50,570	15,922	0	0	50,570	15,922
1902	0	0	21,816	0	0	0	21,816	15,922	0	0	21,816	15,922
1903	18,087	0	50,037	0	0	0	50,037	15,922	0	4,235	50,037	15,922
1904	0	0	24,180	0	0	0	24,180	15,965	0	0	24,180	15,965
1905	99,337	0	62,587	0	32,989	0	62,587	15,922	13,657	54,529	62,587	15,922
1906	201,800	0	67,456	0	184,996	0	67,456	15,922	23,964	123,201	67,456	15,922
1907	219,486	0	82,808	0	204,516	0	82,808	15,922	127,639	123,335	82,808	15,922
1908	62,322	0	56,444	0	59,529	0	56,444	15,965	10,159	0	56,444	15,965
1909	104,979	0	72,101	0	75,341	0	72,101	15,922	52,260	32,119	72,101	15,922
1910	85,557	0	54,518	0	83,808	0	54,518	15,922	75,162	0	54,518	15,922
1911	153,559	0	70,413	0	124,229	0	70,413	15,922	100,816	70,041	70,413	15,922
1912	11,255	0	47,362	0	496	0	47,362	15,965	0	7,761	47,362	15,965
1913	47,834	0	40,386	0	39,563	0	40,386	15,922	0	0	40,386	15,922
1914	227,682	0	72,456	0	198,812	0	72,456	15,922	145,722	54,901	72,456	15,922
1915	31,417	0	73,157	0	29,236	0	73,157	15,922	15,984	24,232	73,157	15,922
1916	238,753	0	77,852	0	209,378	0	77,852	15,965	152,318	36,624	77,852	15,965
1917	14,791	0	60,160	0	13,501	0	60,160	15,922	10,464	0	60,160	15,922
1918	61,007	0	58,741	0	31,054	0	58,741	15,922	3,594	49,017	58,741	15,922
1919	7,081	0	37,874	0	0	0	37,874	15,922	0	0	37,874	15,922
1920	41,059	0	60,683	0	16,619	0	60,683	15,965	0	16,978	60,683	15,965
1921	62,355	0	54,013	0	60,199	0	54,013	15,922	39,506	606	54,013	15,922
1922	301,585	0	87,587	0	271,925	0	87,587	15,922	195,521	77,275	87,587	15,922
1923	13,408	0	51,298	0	12,056	0	51,298	15,922	12,056	0	51,298	15,922
1924	0	0	25,517	0	0	0	25,517	15,965	0	0	25,517	15,965
9125	0	0	21,878	0	0	0	21,878	15,922	0	0	21,878	15,922
[e]1926	0	0	40,320	0	0	0	40,320	11,909	0	0	40,320	11,909
Total	2,083,517	0	1,513,303	0	1,675,503	0	1,513,303	473,905	995,229	691,755	1,513,303	473,905
Average	[b]70,035	0	50,867	0	[c]56,320	0	50,867	15,930	[de]33,454	[f]23,252	50,867	15,930

[a] Partial year, January 1 to October 1.

[b] Entries in this column taken from Tables 16 and 16a. In the computation for these tables, the period closed with 47,727 acre-feet more water in storage than at the beginning, the equivalent of 1,604 acre-feet per season. It should be added to the average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[c] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[d] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

[e] The aggregate of the entries in this column is smaller than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in seasonally stored water in preparing this table.

[f] The aggregate of the entries in this column is larger than the corresponding entries in Tables 13 and 13a, from which it is derived, by an average of about 500 acre-feet per season. This water, 15,400 acre-feet total, was released in controlling floods during April, 1906, but was included in seasonally stored water in preparing this table.

TABLE 18. (Concluded). SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

AVERAGE SIZE OF FLOWS OF WATER YIELD FOR THREE STEPS IN COORDINATING THE USE OF RESERVOIR SPACE.

Height of dam, 383 feet. Maximum controlled flow at Azusa, 1,900 second-feet.

Capacity of reservoir, 180,000 acre-feet. Maximum flood control reserve, 131,000 acre-feet.

Natural flow up to 152 second-feet passed for prior rights.

Year	Size of total flow at Azusa in second-feet — Grand total, 0–1900			Year	Size of total flow at Azusa in second-feet — Grand total, 0–1900		
	Flood control alone [b]Water drawn from reservoir only as required by reservoir operating diagram, in acre-feet	**Flood control partially coordinated with conservation** [c]Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram, in acre-feet	**Flood control completely coordinated with conservation** [d]Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period, constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram, in acre-feet		**Flood control alone** [b]Water drawn from reservoir only as required by reservoir operating diagram, in acre-feet	**Flood control partially coordinated with conservation** [c]Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram, in acre-feet	**Flood control completely coordinated with conservation** [d]Reservoir emptied each summer to a level that would maintain a constant draft of 22 second-feet through critical period, constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram, in acre-feet
1897	83,172	85,292	102,193	1914	300,138	287,190	289.001
1898	29,171	42,458	31,609	1915	104,574	118,315	129,295
1899	10,463	26,385	26,385	1916	316,605	303,195	282,759
1900	11,976	27,898	27,898	1917	74,951	89,583	86,546
1901	87,040	66,492	66,492	1918	119,748	105,717	127,274
1902	21,816	37,738	37,738	1919	44,955	53,796	53,796

1903	68,124	65,959	70,194	1920	101,742	93,267	93,626
1904	24,180	40,145	40,145	1921	116,368	130,134	110,047
1905	161,924	111,498	146,695	1922	389,172	375,434	376,305
1906	269,256	268,374	230,543	1923	64,706	79,276	79,276
1907	302,294	303,246	349,704	1924	25,517	41,482	41,482
1908	118,766	131,938	82,568	1925	21,878	37,800	37,800
1909	177,080	163,364	172,402	[a]1926	40,320	52,229	52,229
1910	140,075	154,248	145,602				
1911	223,972	210,564	257,192	Total	3,596,820	3,662,711	3,674,192
1912	58,617	63,823	71,088	Average	120,902	123,117	123,503
1913	88,220	95,871	56,308	Average evaporation	2,939	2,584	2,198
				Average total flow	123,841	125,701	125,701

[a] Partial year, January 1 to October 1.

[b] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 47,727 acre-feet more water in storage than at the beginning, the equivalent of 1604 acre-feet per season. It should be added to the average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[c] Entries in this column taken from Tables 16 and 16a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from average yield in flood control water to obtain the exact yield of the period. This was not done in preparing this table.

[d] Entries in this column taken from Tables 13 and 13a. In the computations for these tables, the period closed with 7601 acre-feet less water in storage than at the beginning. This water, the equivalent of 256 acre-feet per season, entered storage prior to the beginning of the period and was released as flood control water during the first flood season. It should, therefore, be deducted from the average yield in flood control water to obtain the exact yield for the period. This was not done in preparing this table.

Performance of the four illustrative reservoir operating diagrams in controlling floods when coordinated with conservation.

The last section of Chapter V describes the performance of the four illustrative reservoir operating diagrams in controlling floods. Tests are tabulated of their application to the records of all important floods on their respective streams. It was shown that reservoir operation in accord with these diagrams would provide more space than needed to detain the excess water of all floods of record and that the average space to spare while controlling all the large floods of record would have been about half the maximum reserve. In these computations, it was assumed that no water was released from the reservoir except as required by the diagrams. It may be observed in reviewing Plates XXIII to XXVI, inclusive, on which is delineated the reservoir stage while so controlling floods, together with the stage while controlling floods coordinately with conservation as described in this chapter, that at times the reservoir is needlessly full of water when operating for flood control alone, but when flood control is coordinated with conservation, it may be observed that the draft for useful purposes lowers the reservoir level much of the time below that required for flood control only. At these times the space available for detaining flood water is increased over that resulting from the application of the diagram not coordinated with conservation. Although this extra empty space is variable in the time and amount of its occurrence, nevertheless, it is useful in detaining some flood water.

Tables of unused reservoir space in controlling the floods of record when flood control and conservation are coordinated as described in this chapter, are prepared in parallel to those of Chapter V which tabulates the unused space in controlling the same floods by the same reservoirs and by the same reservoir operating diagrams but independently of conservation. A comparison of these tables shows that coordination with conservation as herein described for the Kennett reservoir on the Sacramento River did not alter the minimum space to spare of 53,500 acre-feet on March 20, 1907, but did increase the average space to spare in controlling all the floods of record from 52 to 85 per cent of the maximum flood control reserve. Coordination with conservation in the Pardee reservoir on the Mokelumne River, as described herein, increased the minimum space to spare in controlling the rain-water floods from zero to 6600 acre-feet and the average from 42 to 68 per cent of the maximum flood control reserve. It had no effect, however, on the unused space in controlling snow-water floods. On the San Joaquin River, the coordination of flood control and conservation in the Temperance Flat reservoir, as described herein, increased the minimum unused space in controlling the rain-water floods from zero to 74,500 acre-feet and the average from 37 to 370 per cent of the maximum flood control reserve. It did not increase the minimum unused space in controlling the snow-water floods of record but did raise the average unused space from 53 to 111 per cent of the maximum space required. On the San Gabriel River, coordination of flood control with seasonal storage and a constant draft, as described herein, increased the minimum unused space from 12,700 to 32,600 acre-feet and the average unused space while regulating all the floods of record from 54 to 69 per cent of the maximum flood control reserve.

KENNETT RESERVOIR ON SACRAMENTO RIVER.

UNUSED SPACE WHILE CONTROLLING ALL FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM, 1895-1926.

Reservoir Operated Coordinately for Irrigation with Incidental Power, and Flood Control.

Height of dam 420 feet. **Capacity of reservoir 2,940,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 125,000 second-feet maximum near Red Bluff		
			Reservoir space not used in controlling flood	
Date	Mean daily flow near Red Bluff in second-feet	Date reservoir nearest full	In acre-feet	In per cent of maximum space required for flood control (454,000 acre-feet)
Feb. 3, 1909	254,000	Feb. 4, 1909	188,800	42
Feb. 2, 1915	249,000	Feb. 2, 1915	200,900	44
Mar. 20, 1907	196,000	Mar. 21, 1907	53,500	12
Jan. 16, 1909	188,000	Jan. 18, 1909	191,400	42
Feb. 16, 1904	188,000	Feb. 16, 1904	357,700	79
Jan. 21, 1909	177,000	Jan. 21, 1909	150,700	33
Feb. 25, 1917	176,000	Feb. 25, 1917	761,400	168
Feb. 21, 1914	160,000	Feb. 21, 1914	119,600	26
Jan. 1, 1914	151,000	Jan. 2, 1914	926,300	204
Feb. 24, 1902	151,000	Feb. 26, 1902	289,100	64
Mar. 8, 1904	147,000	Mar. 8, 1904	332,400	73
Feb. 10, 1902	140,000	Feb. 12, 1902	528,400	116
Mar. 31, 1906	137,000	Mar. 31, 1906	105,500	23
Jan. 19, 1906	136,000	Jan. 19, 1906	1,158,800	255
Feb. 4, 1907	134,000	Feb. 4, 1907	433,500	95
Jan. 25, 1903	131,000	Jan. 25, 1903	431,700	95
Mar. 7, 1911	130,000	Mar. 7, 1911	368,400	81
Jan. 27, 1896	128,000	Jan. 27, 1896	341,500	75
Average.....	.....	.....	385,500	85

PARDEE RESERVOIR ON MOKELUMNE RIVER.

UNUSED SPACE WHILE CONTROLLING TWENTY LARGEST RAIN WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM, 1904-1926.

Reservoir Operated Coordinately for Municipal Supply with Incidental Power, and Flood Control.

Height of dam 345 feet. **Capacity of reservoir 222,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 5,300 second-feet maximum near Clements		
			Reservoir space not used in controlling flood	
Date	Mean daily flow near Clements in second-feet	Date reservoir nearest full	In acre-feet	In per cent of maximum space required for flood control (92,000 acre-feet)
Jan. 30, 1911	16,700	Feb. 1, 1911	35,200	38
Mar. 19, 1907	15,310	Mar. 27, 1907	7,100	8
Jan. 26, 1914	11,100	Jan. 27, 1914	68,900	75
Jan. 14, 1909	10,400	Jan. 17, 1909	19,500	21
Feb. 21, 1914	9,850	Feb. 21, 1914	82,700	90
Feb. 6, 1925	9,700	Feb. 6, 1925	167,800	182
Jan. 1, 1914	9,250	Jan. 1, 1914	82,000	89
Jan. 21, 1909	8,400	Jan. 22, 1909	8,500	9
Mar. 20, 1916	8,040	Mar. 21, 1916	64,400	70
Feb. 2, 1907	7,860	Feb. 4, 1907	79,300	86
Mar. 31, 1906	7,750	April 1, 1906	49,600	54
Mar. 23, 1907	7,610	Mar. 27, 1907	7,100	8
Jan. 22, 1914	7,470	Jan. 22, 1914	78,600	85
Jan. 18, 1921	7,350	Jan. 18, 1921	75,700	82
Mar. 7, 1911	7,210	Mar. 11, 1911	70,900	77
Nov. 21, 1909	7,200	Nov. 21, 1909	68,300	74
Feb. 11, 1919	7,060	Feb. 11, 1919	90,400	98
Jan. 19, 1906	6,960	Jan. 19, 1906	76,400	83
Mar. 12, 1918	6,940	Mar. 12, 1918	109,600	119
April 16, 1925	6,910	April 17, 1925	6,600	7
Average			62,400	68

PARDEE RESERVOIR ON MOKELUMNE RIVER.

UNUSED SPACE WHILE CONTROLLING ALL SNOW WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM, 1904-1926.

Reservoir Operated Coordinately for Municipal Supply with Incidental Power, and Flood Control.

Height of dam 345 feet. **Capacity of reservoir 222,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 7,100 second-feet maximum near Clements		
			Reservoir space not used in controlling flood	
Date	Mean daily flow near Clements in second-feet	Date reservoir nearest full	In acre-feet	In per cent of maximum space required for flood control (13,000 acre-feet)
June 12, 1906	8,740	June 13, 1906	1,900	15
June 18, 1911	8,030	June 18, 1911	3,300	25
June 3, 1922	7,970	June 5, 1922	2,600	20
June 12, 1911	7,960	June 12, 1911	3,100	24
June 6, 1911	7,880	June 6, 1911	4,000	31
May 31, 1922	7,770	June 1, 1922	6,700	52
June 1, 1915	7,750	June 1, 1915	10,000	77
May 18, 1922	7,670	May 19, 1922	1,800	14
June 16, 1906	7,600	June 17, 1906	4,500	35
June 10, 1917	7,550	June 10, 1917	2,900	22
May 24, 1911	7,500	May 24, 1911	800	6
July 4, 1906	7,480	July 4, 1906	1,100	8
Average			3,600	28

TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

UNUSED SPACE WHILE CONTROLLING ALL RAIN WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM, 1907-1926.

Reservoir Operated Coordinately for Irrigation with Incidental Power, and Flood Control.

Height of dam 595 feet. **Capacity of reservoir 1,071,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 10,700 second-feet maximum near Friant		
			Reservoir space not used in controlling flood	
Date	Mean daily flow near Friant in second-feet	Date reservoir nearest full	In acre-feet	In per cent of maximum space required for flood control (133,000 acre-feet)
Jan. 31, 1911	38,800	Feb. 1, 1911	538,000	405
Dec. 31, 1909	27,900	Jan. 1, 1910	260,300	196
Jan. 14, 1909	26,800	Jan. 15, 1909	853,400	642
Dec. 10, 1909	26,800	Dec. 10, 1909	418,100	314
Jan. 26, 1914	24,700	Jan. 26, 1914	811,700	610
Jan. 21, 1909	18,900	Jan. 22, 1909	751,400	565
Mar. 8, 1911	18,800	Mar. 8, 1911	344,700	259
Mar. 10, 1911	13,600	Mar. 10, 1911	310,200	233
Feb. 12, 1909	12,500	Feb. 12, 1909	631,800	475
Feb. 21, 1917	11,700	Feb. 21, 1917	321,700	242
April 6, 1911	11,600	April 6, 1911	141,900	107
Jan. 18, 1916	11,000	Jan. 18, 1916	414,500	312
Mar. 21, 1916	11,000	Mar. 21, 1916	74,500	56
Oct. 2, 1918	10,900	Oct. 2, 1918	775,000	583
Jan. 25, 1911	10,700	Jan. 25, 1911	735,900	553
Average			492,200	370

TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

UNUSED SPACE WHILE CONTROLLING ALL SNOW WATER FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM 1907-1926.

Reservoir Operated Coordinately for Irrigation with Incidental Power, and Flood Control.

Height of dam 595 feet. **Capacity of reservoir 1,071,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 14,200 second-feet maximum near Friant		
			Reservoir space not used in controlling flood	
Date	Mean daily flow near Friant in second-feet	Date reservoir nearest full	In acre-feet	In per cent of maximum space required for flood control (177,000 acre-feet)
June 13, 1911	23,100	June 23, 1911	21,100	12
June 4, 1909	22,800	June 8, 1909	89,100	50
June 16, 1911	21,500	June 23, 1911	21,100	12
July 7, 1911	19,500	July 7, 1911	57,600	33
June 5, 1922	16,700	June 8, 1922	417,100	236
May 22, 1911	16,200	May 23, 1911	134,600	76
June 6, 1911	16,200	June 8, 1911	165,500	94
May 8, 1909	16,200	May 8, 1909	308,800	174
June 2, 1914	15,700	June 2, 1914	167,500	95
June 5, 1912	15,300	June 5, 1912	526,400	297
June 15, 1909	14,900	June 15, 1909	95,000	54
June 27, 1911	14,700	June 28, 1911	38,200	22
May 31, 1922	14,700	June 1, 1922	575,000	325
June 24, 1909	14,600	June 24, 1909	129,300	73
Average			196,200	111

SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.
UNUSED SPACE WHILE CONTROLLING TWENTY LARGEST FLOODS OF RECORD BY RESERVOIR OPERATING DIAGRAM, 1895-1926.

Reservoir Operated Coordinately for Flood Control, Seasonal and Over-year Storage.

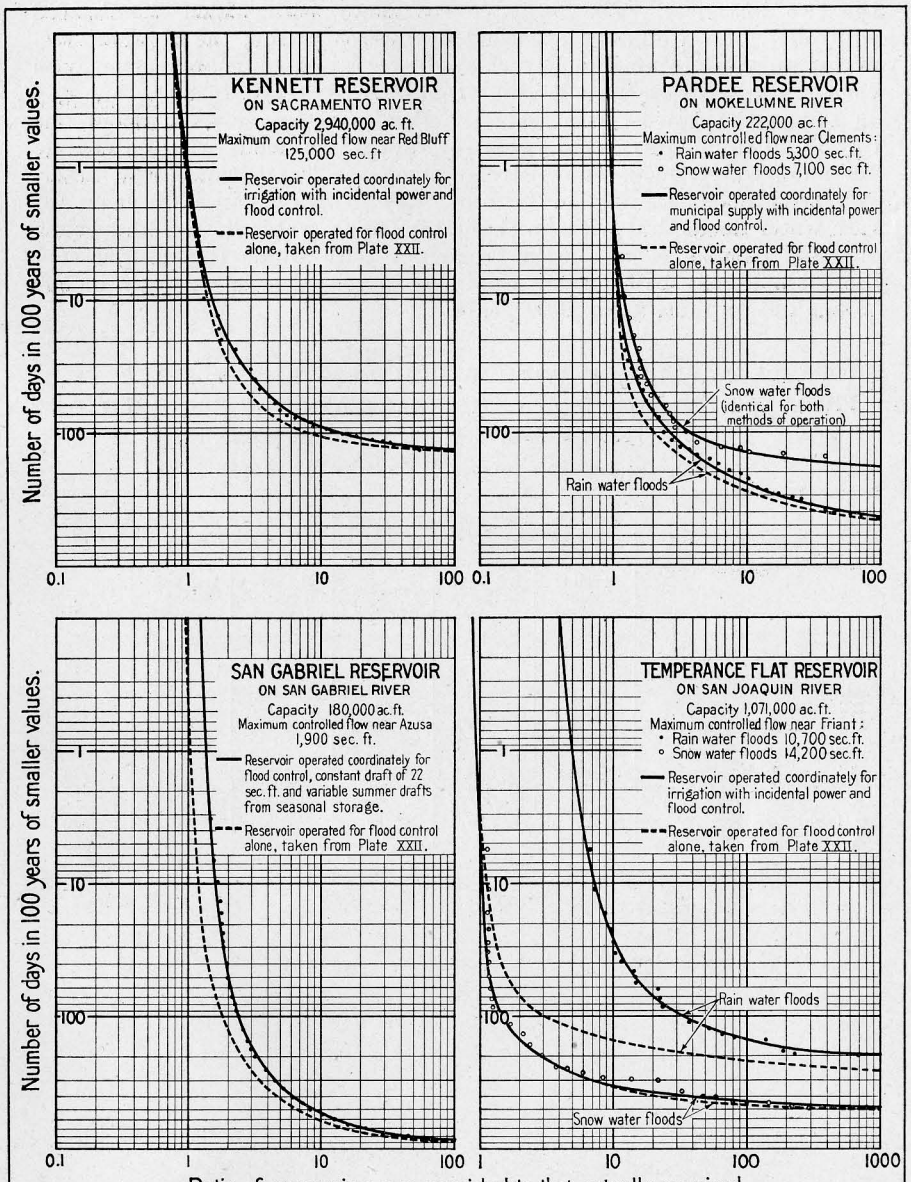
Height of dam 383 feet. **Capacity of reservoir 180,000 acre-feet.**

Maximum flood flow—uncontrolled		Flow controlled to 1,900 second-feet maximum near Azusa		
Date	Mean daily flow near Azusa in second-feet	Date reservoir nearest full	Reservoir space not used in controlling flood	
			In acre-feet	In per cent of maximum space required for flood control (131,000 acre-feet)
Jan. 18, 1916	22,300	Jan. 20, 1916	50,800	39
Dec. 19, 1921	16,000	Dec. 25, 1921	71,800	55
Jan. 1, 1910	12,500	Jan. 3, 1910	89,000	68
Feb. 20, 1914	11,800	Mar. 1, 1914	64,500	49
Mar. 12, 1905	11,130	Mar. 14, 1905	94,000	72
Mar. 26, 1906	9,430	Mar. 29, 1906	32,600	25
Mar. 10, 1911	9,160	Mar. 14, 1911	71,400	54
Jan. 26, 1914	9,150	Jan. 27, 1914	111,600	85
Feb. 9, 1922	8,200	Feb. 13, 1922	104,300	80
Mar. 12, 1906	8,020	Mar. 13, 1906	103,400	79
Jan. 27, 1916	7,940	Jan. 30, 1916	42,600	33
Feb. 7, 1909	7,100	Feb. 8, 1909	118,100	90
Mar. 5, 1907	6,810	Mar. 11, 1907	89,900	69
April 1, 1903	5,920	April 2, 1903	137,700	105
Dec. 27, 1921	5,900	Dec. 29, 1921	53,700	41
Jan. 29, 1911	5,260	Jan. 29, 1911	126,600	97
Jan. 18, 1914	5,110	Jan. 18, 1914	125,600	96
Mar. 11, 1918	5,030	Mar. 14, 1918	91,600	70
Jar. 10, 1907	4,670	Jan. 11, 1907	110,900	85
Jan. 31, 1911	4,220	Jan. 31, 1911	122,400	93
Average			90,600	69

The full tests are expressed graphically on Plate XXVII, "Performance of Reservoir Operating Diagrams in Controlling Floods of Record Coordinately with Conservation." The ratio of the empty reservoir space while controlling floods coordinately with conservation as described herein, to that actually necessary for control of the remainder of the flood was computed for every day of stream flow record on each of the four illustrative streams. The ratios on each stream were arranged in order of increasing magnitude and the number smaller than each successive size counted. These counts were increased by proportion to the number had the stream flow records been 100 years in length, and plotted on Plate XXVII. Smooth curves were drawn which indicate the probable frequency with which the empty space on hand at any time will approach the exact amount that should be on hand to insure the desired flood regulation. Superimposed on these are dashed-line curves transposed from Plate XXII, p. 96. These indicate the corresponding relations in controlling floods when not coordinated with conservation.

Comparison is made in the following table of the probable number of days in 100 years on which empty space equal to or greater than the exact amount required for controlling floods would be provided in

PLATE XXVII.



PERFORMANCE OF RESERVOIR OPERATING DIAGRAMS IN CONTROLLING FLOODS OF RECORD COORDINATELY WITH CONSERVATION

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RATIO OF RESERVOIR SPACE PROVIDED BY APPLICATION OF DIAGRAM TO THAT ACTUALLY REQUIRED FOR CONTROLLING FLOODS OF RECORD IS SMALLER THAN INDICATED.

the two instances. The probable frequency with which the desired controlled flow would be exceeded downstream from the Kennett reservoir on the Sacramento River, would be raised by coordination with conservation as described herein, from about one day in 80 to one day in 100 years; downstream from the Pardee reservoir from about one day in 40 to one day in 50 years for rain-water floods with no change for snow-water floods; downstream from the Temperance Flat reservoir from about one day in 30 to one day in more than 1000 years for rain-water floods, but with no change for snow-water floods; and below the San Gabriel reservoir the frequency with which the desired controlled flow may be exceeded would be increased from one day in 500 to one day in more than 1000 years.

PROBABLE FREQUENCY WITH WHICH LESS EMPTY SPACE THAN FROM ONE TO TWO TIMES THE EXACT AMOUNT REQUIRED TO CONTROL FLOODS WILL BE PROVIDED.

(Frequency in number of days in 100 years).

Reservoir as described herein	Flood control **coordinated** with conservation as described in Chapter VI			Flood control as described in Chapter V, **not coordinated** with conservation		
	Equal to that required	Half again that required	Twice that required	Equal to that required	Half again that required	Twice that required
Kennett	1	9	20	1.2	12	30
Pardee—						
Rain-water floods	2.0	40	70	2.5	60	100
Snow-water floods	2.5	24	50	2.5	24	50
Temperance Flat—						
Rain-water floods	Less than 0.1	Less than 0.1	Less than 0.1	3.2	43	70
Snow-water floods	3.2	100	150	3.2	100	150
San Gabriel	Less than 0.1	40	50	0.5	50	120

CHAPTER VII.

CONCLUSIONS.

Reliability of analyses.

The system of flood analysis herein described, illustrated, and tested is entirely empirical. Although it is in accord with theoretic considerations, nevertheless, it does not rest upon hypothesis but rather is deduced directly from the past behavior of floods as shown by the records of their measurement. But one assumption is employed, namely, that whatever relation that may exist between the time of year, the occasion and the size of flood occurrence, should be contained within existing stream-flow data. In order to discover this relation, the usual distinction between flood and normal flow is omitted. The relation between time of year, occasion and size of occurrence is sought for flows of all magnitudes contained in the measured record with the expectancy that this relation, when found, may be extended to disclose the circumstances under which flows of extraordinary size may occur, flows larger than are contained within the stream flow records or are evidenced by high water marks or dimensions of existing flood channels. In seeking this relation interest is not centered in average occurrences as in many engineering investigations, but rather in the limiting conditions of flood occurrence. The safety of lives and property require that works for flood protection be designed for exceptional rather than average conditions, otherwise, the flood menace would not be removed. Therefore, the analyses take the form of discussions of the frequency with which various size flows occur at different times of the year and with different amounts of seasonal precipitation up to the time of their occurrence.

The limiting conditions of flood occurrence about which knowledge is desired, are the circumstances under which the very infrequent floods occur. The limits in time of year and in the amount of previous rainfall with which extraordinary stream discharge occurs, are sought through the development of curves expressing the average frequency of past occurrences. It was found by trial that the data expressing the relation between size of flow and average frequency of its occurrence plot on fairly smooth curves of similar shape for all California streams on which continuous measurements have been made. While most of the data from which these curves are developed concern ordinary events, as they happen less frequently they approach the extraordinary. By the extension of these curves beyond the limits of the plotted data, the frequency may be anticipated of events so extraordinary that not even a single one is contained within the period of record. By this system of graphical analysis, estimate is made of

what the records would disclose were they many times longer than they actually are.*

The inclusion in these analyses of all data on stream discharge without distinction between flood and normal flow multiplies many times the number of data available to guide the drafting of curves of relationship. In a record of stream flow, say thirty years long, there may be from three to six thousand entries of daily flow while the entries customarily regarded as floods may be limited to perhaps from fifteen to thirty. Thus, in the system of analyses herein employed, a large volume of data defines with considerable certainty that part of the curves of relationship pertaining to usual occurrences so that the trend of the curves is established as they approach the zones of infrequent occurrence into which they are extended.

Whether or not stream discharge follows sufficiently definite rules to warrant the close consideration herein given was seriously questioned at the time the work was started. For this reason, the first effort held to a comparatively simple scheme of analysis. Working with an appreciation that the subject is not one favorable for exactness, two efforts were made before the subject could be adequately gauged. While a casual review of the work as finally completed is not entirely convincing that the great volume of detail with which the subject has been pursued, is warranted, yet, to those who have taken part in the intricate comparisons, it became evident before proceeding very far, that much of the apparent scattering of plotted points on the diagrams is the result of the small amount of data on infrequent flows contained in the comparatively short period of stream flow record in California, rather than of inconsistencies in relationship. The relationship under study pertains only to the average frequency of occurrence without regard to the sequence of events, so that, in plotting the data, frequencies were assigned necessarily based upon the number of times events occurred within the period of measured record. The infrequent events that

* Inasmuch as this entire work is an analysis of the historical trend of flood occurrence, as disclosed by the period of measured stream flow record, it is of interest to discover if possible to what extent discordant events may be expected to occur. In reviewing this possibility among rainfall data that antedate stream flow records by some 30 or 40 years, it was observed that the seasons 1883–4 and 1889–90 in southern California were very unusual. Both had more than double normal precipitation while the largest season during the period of measured run-off had barely 50 per cent more than normal precipitation. Also the season 1883–4, as disclosed by the records at Los Angeles, was unusual in having a storm of 2.32 inches in two days during the fore part of April, while the season 1889–90 was extremely unusual in the volume of fall precipitation, it aggregating by January 1, 1890, 62 per cent in excess of the total for a normal season. A detail study of the daily precipitation of these two seasons shows that, had the reservoir operating diagram for the San Gabriel River been in use, there might have been technical failure in its operation by the reservoir filling and some water passing over the spillway to augment the controlled flow below the reservoir, however, no reason was found to suppose that this quantity would have been large enough to be serious. It is evident from studying the records that both of these seasons had unusual features that depart materially from the trend of the period of measured run-off so that some modification of the reservoir operating diagram for the San Gabriel River, as herein presented, would probably be required if it were desired that the operation of the diagram be technically perfect in these two seasons and run-off records were at hand to work with.

Run-off data collected on the four illustrative streams since the close of the analyses contained in this bulletin have also been reviewed for discordant events. It was found that all floods, including that of March 25–27, 1928, would have been controlled as anticipated. The flood of March 25–27, 1928, on the Mokelumne River, however, exceeded the once-in-50-year value which, by construction, the diagram is not expected to control. Therefore, the empty space provided by the diagram fails to control this flood under direct test. Nevertheless, with flood control and conservation coordinated as described herein, this flood would have been controlled to the specified maximum flow by reason of the additional empty space provided by the drawdown resulting from normal conservation draft.

occur but once or twice within the period of record, are thus accorded an average standing that may or may not be actually theirs. It is apparent that the occurrence of these infrequent events within the years during which stream flow measurements happened to be made, is much a matter of circumstance since there appears to be no orderly sequence in the size of stream flow. When longer records of stream flow become available, no doubt many of these events will be found to pertain to quite different average intervals than those herein assigned. With this viewpoint in mind, positions on the diagrams were found for the curves and parts of curves representing infrequent events that are logical in relation to the plotted data but that appear in places to be out of sympathy with some of them. Whether or not the interpretations are correct can not be foretold. Greater length of stream flow record alone can furnish the means of improving these interpretations of the data. In the meantime the results of the analyses should be employed with judgment.

The four reservoir operating diagrams, constructed as a conclusion of the analyses described herein, are tested against the entire period of stream-flow record on their respective streams at the close of Chapters V and VI and are found to be entirely adequate for controlling all floods of record. In fact, for the most part, more than half the space provided by the diagrams for detaining excess flood water is seldom used in these tests. Even the largest floods of record do not require the entire reserve to detain their volume of excessive flow. Although in engineering practice, test against the period of record is often deemed sufficient to determine the reliability of performance of proposed control works, nevertheless, it is thought that a particular advantage of the system of analysis herein described is that it affords the means of designing flood control works not only adequate for all occurrences of historical record but adequate, to the degree selected, for future expectancies as disclosed by the trend of the historical record. It is of interest to note, for instance, in connection with the reservoir operating diagram for controlling floods on the San Gabriel River when employed in the "Coordinated Plan," that only three-fifths of the 131,000 acre-feet of maximum flood control reserve is filled while controlling the largest flood of record to 1900 second-feet, and that only one-third of this maximum reserve is filled on an average in so controlling the twenty largest recorded floods. This reservoir operating diagram was designed to control floods larger than have occurred within the period of record. For this reason the floods of record do not fill the entire reserve. A safety factor either greater or less than indicated by the above figures could have been introduced in the diagram at the time of its construction if it were thought desirable.

In response to the question as to what would happen if several large floods should follow one another, the largest flood of record in each calendar month from December to April on the San Gabriel River was selected and they were assumed to follow one another, each occurring on its actual calendar date under the conditions of recorded precipitation but transposed to a hypothetical year. The transposition was made from one year to the other on the day before the first rapid increase in flow of the next flood. By test against this series of floods,

the San Gabriel diagram was thus found to be adequate to control in succession the floods of December, 1921, January, 1916, February, 1914, March, 1905, and April, 1926.

It may be concluded, therefore, that the reliability of the system of analyses herein described is essentially dependent upon the extent to which the future will repeat the past. If it does and the years of stream flow record at hand disclose the past correctly, then the deductions of these analyses are reliable. If it does not, the deductions involve the same error that is contained in all other hydraulic estimates of common use. The foundation of all engineering rests upon the expectancy of a repetition of past events under like circumstances in the future. Many millions of dollars are spent annually and whole cities are erected upon this assumption. Without it practical engineering could not progress. The nineteen to thirty-one years of stream flow measurement upon which the illustrations of this volume are based, furnish a longer record than is available in many instances for hydraulic design. The lack of data often makes it necessary to base hydraulic design on rather brief stream flow records and sometimes none at all. Because these illustrations are based upon the longest records of stream flow in the state, it is believed that they have a stronger claim for accuracy than most work of the kind. Therefore, the analyses of this volume are presented as illustrative of principles relating to the control of floods by reservoirs adequately reliable in their essential features for practical application, if judgment is employed. Although the reservoir operating diagrams are presented as a culmination to these analyses, nevertheless, it is not intended that their features should be applied indiscriminately. They are presented as illustrations and their features should be adjusted to the necessities of each specific instance in order to secure good results.

Accuracy of analyses.

Essentially speaking, the accuracy of the analyses contained herein is dependent upon the correctness of the rainfall and stream gaging records employed. It is commonly known that the cost of gaging streams with exactness is prohibitive for general work. On the other hand, experience in California indicates that for the most part, the records of the United States Geological Survey that have been used exclusively in this work, are substantially correct. To seriously affect the analyses there would have to be an error in either the observations of rainfall or stream flow continuing through years of time, or in the records of the larger floods that cast the greater influence in the extension of the curves of the several diagrams. This volume is prepared with full acceptance of the stream gaging and rainfall records as published or in preparation for publication by the federal bureaus. It has been left to the judgment of whoever may utilize its contents, to introduce such safety factor in this respect as may be deemed desirable under the circumstances at the time of use. Attention has been placed on producing a work that would make this possible.

Effect of length of stream flow record upon the accuracy of deductions.

In reviewing the analyses described in this volume, it may seem rather bold to attempt to predict the vast future from the trend of

occurrences during the past 15 to 30 years, yet, there appears to be no alternative, if such knowledge is desired, until sufficient time has elapsed from the beginning of systematic records for the accumulation of more data. Systematic measurements of California streams started in 1895, only thirty-two years ago. It was some time, however, before many streams were included in the program, so that there are now only a few that have been measured for more than twenty years. Fortunately, as closer settlement and larger property values urge greater accuracy in flood analysis than can be attained at present, the experience of additional years will be at hand for more perfect analyses than can be attained with present information. In the meantime, judgment must be employed in the application of the best analyses possible of available data.

In order to throw some light upon the extent to which the length of stream flow record affects the required reservoir space for controlling floods indicated by these analyses, Plate XXVIII, "Effect of Omission of the First Half of the Years of Record that Contains Five of the Largest Floods on Indicated Reservoir Space Required to Control Floods on Sacramento River near Red Bluff," has been prepared. It illustrates the variance in deductions that may be made from two records, one half the length of the other and containing only the lesser floods. The analysis shown in black is taken from Plate X of Chapter IV. It employs the entire thirty years of record on the Sacramento River. Superimposed in red is an analysis of the last fifteen years, similar in all respects to the first except that it employs only the half of the record subsequent to the historic flood years of 1907 and 1909.

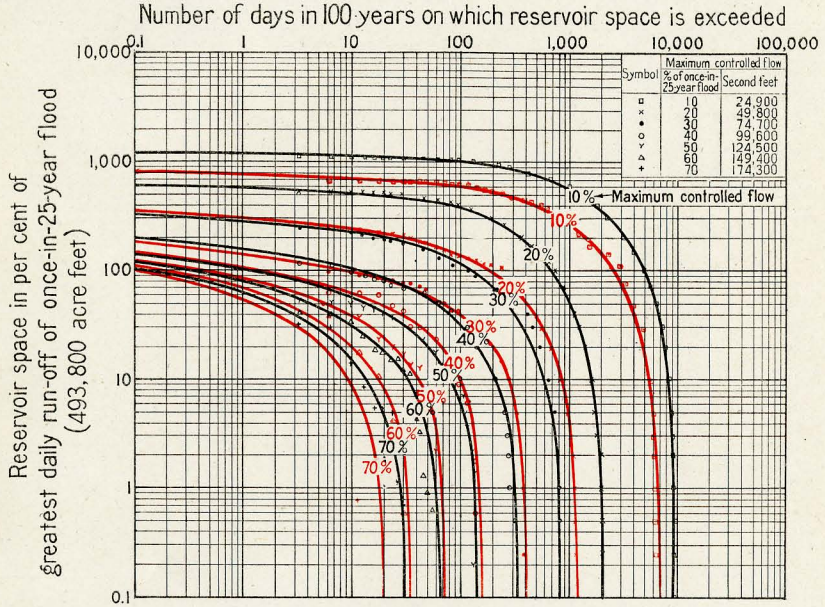
It may be observed, in the part of the plate relating to the data used in constructing Plate XVIII, "Reservoir Operating Diagram for Controlling Floods on the Sacramento River," that the difference in the maximum flood control reserve determined by these two analyses, is 15 per cent.

Geographical limitations of system of analysis.

Since the entire analysis herein presented is empirical and has been developed and tested entirely from data on California streams, it is not known to what extent it may be successfully applied in other localities. No doubt the definite limits to the flood season found in these analyses bear some relation to the sharp demarcation between the wet and dry seasons, one of the distinctive features of California climate. Since this distinct wet and dry season is the reason for conserving flood waters in California, it seems probable that the double use of the same reservoir space for both flood control and conservation would not be of such economic importance if climatic conditions were different. Therefore, it can not be said, without extended inquiry which has not been made, to what extent the system of analyses herein described applies to localities of less marked wet and dry seasons than California. The discussion herein presented is of California conditions.

Future possibilities of improving proposals for control of floods by reservoirs.

The proposals for controlling floods by reservoirs described herein all pertain to single reservoirs. At the time of preparing this work, a large program of reservoir construction is in its inception in California.



EFFECT OF OMISSION
OF THE
FIRST HALF OF THE YEARS OF RECORD
THAT CONTAINS FIVE OF THE LARGEST FLOODS
ON
INDICATED RESERVOIR SPACE REQUIRED TO CONTROL FLOODS
ON SACRAMENTO RIVER NEAR RED BLUFF

BLACK CURVES – ANALYSIS OF RECORDS 1895 TO 1925
RED CURVES – ANALYSIS OF RECORDS 1910 TO 1925 (FLOODS OF 1904, 1907 AND 1909 OMITTED)

CURVES SHOW NUMBER OF DAYS IN 100 YEARS ON WHICH RESERVOIR SPACE GREATER THAN INDICATED IS NEEDED TO CONTROL FLOODS TO SPECIFIED MAXIMUM FLOW.

Maximum controlled flow expressed in per cent of greatest daily rate of flow of a once-in-25-year flood

Since this program must necessarily be constructed progressively, the possibility of coordinating flood control by reservoirs and conservation is illustrated herein in its relation to the first installment of this large reservoir construction program. The examples worked out demonstrate that the first units of this large reservoir construction program may be used to control floods without interference with conservation values. However, as time goes on and more than one large reservoir is constructed on each stream, the flood control reserve may be divided among several reservoirs instead of being allocated entirely to one as in the illustrations herein. In doing this, either a greater degree of flood control may be effected by enlarging the total reserve or the possibility of interference with conservation may be made even more remote than in the proposals herein described and tested by dividing the reserve without enlargement among several reservoirs.

The proposals for the control of floods by reservoirs may be still further improved as years pass by, since stream flow data covering longer periods of time will be at hand. The added data will permit new analyses to be made that will offer greater assurance of accuracy than is possible at present and through closer study made possible by additional data, no doubt improvements may be devised in the construction of the reservoir operating diagrams. It is certain that much improvement may be made in the part of the diagrams pertaining to snow-water floods.

In the analysis herein, the part of the diagrams pertaining to snow-water floods is constructed using indices of rainfall. Since snow-water floods pertain more to the amount of snow-on-the-ground at any time, rather than upon the total of previous seasonal precipitation, it is evident that, were data of snow-on-the-ground available, superior results could be obtained. This is indicated on Plate XXIV, p. 119, and Plate XXV, p. 131, which show the effect on reservoir stage of controlling floods on the Mokelumne and San Joaquin rivers by the reservoir operating diagrams described in Chapter V. In reviewing these plates, it is noticeable in many instances, that space is held in reserve for flood control during the latter part of June and the first part of July, when, by the indications of subsequent stream flow, the snow in the mountains must have been too far melted to produce floods. Since these reservations of reservoir space are held nearly to the close of the run-off season, they result in the reservoir failing to fill to the point that it otherwise would, had space not been reserved for flood control, and cause a slightly reduced yield thereby. While in these two instances the differences in reservoir yield with and without flood control are small, nevertheless, it is believed that a noticeable improvement could be made in the part of the work relating to snow-water floods, if data relating to snow-on-the-ground were available. It is believed that superior results could be obtained by constructing the part of the reservoir operating diagram relating to snow-water floods upon indices of snow-on-the-ground instead of upon indices of precipitation. The rainfall indices apparently indicate the general character of the season fairly well so far as rain-water floods are concerned, but, in failing to incorporate the effect of weather conditions subsequent to precipitation upon the amount of unmelted snow remaining on the ground, lead to the unnecessary reservation of reservoir space for the control of snow-

water floods almost up to the close of the run-off season. If indices of snow-on-the-ground at some suitable mountain station were used both in constructing and applying the part of the reservoir operating diagrams relating to snow-water floods, the Pardee and Temperance Flat reservoirs undoubtedly would have filled to the same point each year both with and without flood control and there would not have been even the slight reduction in reservoir yield with the inclusion of flood control that is noted in the tests of the reservoir operating diagrams on these two streams. (See pp. 121 and 130.)

Indices of snow-on-the-ground could not be used in constructing the reservoir operating diagrams for the Mokelumne and San Joaquin rivers because records suitable for this purpose are not available. So far as known, the only records of snow-on-the-ground of any length are at points in the Sacramento River drainage basin. Since snow melts earlier in the season in the Sacramento than in the San Joaquin basin, these records are not adapted for use on the Mokelumne and San Joaquin rivers.

CHAPTER VIII.

TABLES OF MONTHLY SUMMARIES OF WATER AND POWER YIELD OF RESERVOIRS ON THE FOUR ILLUSTRATIVE STREAMS.

Yield computed on a daily basis to show the effect of inclusion of the flood control feature upon the yield of the "Coordinated Plan."

KENNETT RESERVOIR ON SACRAMENTO RIVER.

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Table No.		*Page*
	Assumptions employed in computing water and power yield	216
1a.	Operating primarily for power generation with incidental irrigation. With and without flood control by reservoir operating diagram	218
2a.	Operating primarily for irrigation with incidental power generation. With and without flood control by reservoir operating diagram	234
3a.	Operating primarily for irrigation. Comparison for two methods of flood control	250
4a.	Operating primarily for power generation with incidental irrigation. Comparison for two methods of flood control	266
5a.	Summary of power yield. With and without two methods of flood control	282

PARDEE RESERVOIR ON MOKELUMNE RIVER.

Height of dam 345 feet. Capacity of reservoir 222,000 acre-feet.

	Assumptions employed in computing water and power yield	298
6a.	Yield with and without flood control by reservoir operating diagram	300
7a.	Comparison of yield for two methods of flood control	312
8a.	Summary of yield in water and power with and without flood control	324

TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

	Assumptions employed in computing water and power yield	331
9a.	Yield with and without flood control by reservoir operating diagram	332
10a.	Comparison of yield for two methods of flood control	342
11a.	Summary of yield in water and power	352

SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER.

Heights of dams 383 and 425 feet. Capacity of reservoirs 180,000 and 240,000 acre-feet.

	Assumptions employed in computing water yield	358
12a.	Yield under "Coordinated Plan." Flood control and seasonal storage coordinated. Capacity 180,000 and 240,000 acre-feet	360
13a.	Yield under "Coordinated Plan." Flood control and seasonal and over-year storage coordinated. Capacity 180,000 and 240,000 acre-feet	382
15a.	Comparison of yield for two methods of flood control. Flood control coordinated with seasonal and over-year storage. Capacity 180,000 acre-feet	404
16a.	Comparison of yield for three steps in coordinating the use of reservoir space. Capacity 180,000 acre-feet	426
17a.	Comparison of yield operating for flood control and constant draft only. Capacity 180,000 and 240,000 acre-feet	448

ASSUMPTIONS EMPLOYED IN COMPUTING WATER AND POWER YIELD OF KENNETT RESERVOIR ON SACRAMENTO RIVER ON DAILY BASIS.

1. Water supply at dam site is the flow at the Red Bluff gaging station of the United States Geological Survey unimpaired by upstream diversions, less 25.9 per cent which is estimated to originate on the average on the drainage area between the dam site and gaging station, and less the unimpaired flow of the Pit River at Bieber. No deductions are made for prior rights downstream from the dam.

2. Daily stream flow at the dam site on any day within a month bears the same relation to the monthly mean at the dam site as the measured mean daily discharge of the same date at the Red Bluff gaging station of the United States Geological Survey bears to the corresponding measured monthly mean at this station.

3. The reservoir is full on June 1, 1895, the opening date of the estimates. Run-off index of season 1894–1895 is 124. The reservoir fills in 1925 with a run-off index of 81.

4. The net evaporation from the reservoir surface equals 3.5 feet depth per annum, divided among the months as follows:

Month	*Depth in feet*	*Per cent of seasonal total*
April	0.32	9.2
May	0.44	12.6
June	0.52	15.0
July	0.62	17.8
August	0.58	16.6
September	0.45	12.7
October	0.34	9.6
November	0.23	6.5
	3.50	100.0

5. The total seasonal demand for irrigation water is divided among the months as follows:

Month	*Demand in per cent of total seasonal use*
January	0
February	0
March	1
April	5
May	16
June	20
July	22
August	20
September	12
October	4
November	0
December	0
Total	100

6. The seasonal irrigation yield is that which can be obtained during the period with a deficiency on the average not oftener than one year in ten.

7. Power is generated at a plant near the base of the dam with a power factor of 0.80 and load factors as noted.

8. Primary power yield is the energy that can be generated without fail through every season from 1871 to 1926, divided among the months as follows:

Month	*Electric power consumption in per cent of annual total (state-wide average)*
January	7.3
February	6.9
March	7.8
April	7.9
May	8.8
June	9.0
July	9.4
August	9.5
September	8.7
October	8.5
November	8.0
December	8.2
Total	100.00

9. The secondary power yield is the energy that can be generated intermittently by the installed capacity of the power plant in addition to the primary output.

10. The overall plant efficiency is 75.0 per cent at full reservoir level, increases to 77.4 per cent at 0.8 depth and then decreases to 75.0 per cent at 0.6 depth of a full reservoir.

11. The elevation of the tail race rises 26 feet when 100,000 second-feet are passing the dam, 17 feet when 50,000 second-feet are passing, 10 feet when 25,000 second-feet are passing and corresponding amounts for other flows.

TABLE 1a. KENNETT RESER

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1896										
Jan.	1,980,000	2,256,000	238,000	98,000	0	960,000	389	97,400	40,500	137,900
Feb.	474,000	2,940,000	218,000	173,000	0	83,000	408	98,400	78,000	176,400
Mar.	738,000	2,940,000	245,000	215,000	0	278,000	410	104,200	91,100	195,300
April	891,000	2,940,000	249,000	231,000	7,000	404,000	408	109,000	101,000	210,000
May	1,194,000	2,940,000	279,000	219,000	10,000	686,000	407	117,500	92,500	210,000
June	536,000	2,940,000	283,000	196,000	12,000	80,000	410	124,200	85,800	210,000
July	313,000	2,905,000	298,000	151,000	14,000	0	407	125,400	63,700	189,100
Aug.	268,000	2,755,000	304,000	102,000	13,000	0	400	126,700	42,500	169,200
Sept.	258,000	2,604,000	282,000	101,000	10,000	0	394	120,000	42,800	162,800
Oct.	262,000	2,469,000	278,000	75,000	7,000	0	388	113,400	30,500	143,900
Nov.	472,000	2,371,000	264,000	161,000	5,000	0	385	110,300	66,800	177,100
Dec.	920,000	2,413,000	267,000	246,000	0	0	392	109,400	100,600	210,000
Total or average	8,306,000		3,205,000	1,968,000	78,000	2,491,000	400	113,000	69,500	182,500
1897										
Jan.	577,000	2,820,000	229,000	129,000	0	99,000	412	97,400	55,000	152,400
Feb.	1,338,000	2,940,000	218,000	231,000	0	889,000	408	101,900	108,100	210,000
Mar.	737,000	2,940,000	247,000	251,000	0	239,000	407	104,200	105,800	210,000
April	858,000	2,940,000	249,000	231,000	7,000	371,000	408	109,000	101,000	210,000
May	554,000	2,940,000	276,000	195,000	10,000	73,000	411	117,500	82,500	200,000
June	310,000	2,940,000	283,000	73,000	12,000	0	410	124,200	32,100	156,300
July	275,000	2,882,000	298,000	90,000	14,000	0	407	125,400	37,900	163,300
Aug.	254,000	2,755,000	305,000	87,000	13,000	0	400	126,700	33,200	162,900
Sept.	247,000	2,604,000	282,000	90,000	10,000	0	394	120,000	38,200	158,200
Oct.	262,000	2,469,000	278,000	75,000	7,000	0	388	113,400	30,500	143,900
Nov.	274,000	2,371,000	265,000	97,000	5,000	0	382	110,300	40,300	150,600
Dec.	366,000	2,278,000	274,000	113,000	0	0	380	109,400	45,200	154,600
Total or average	6,052,000		3,204,000	1,662,000	78,000	1,671,000	401	113,400	59,100	172,500
1898										
Jan.	257,000	2,257,000	243,000	0	0	0	380	97,400	0	97,400
Feb.	478,000	2,271,000	226,000	0	0	0	388	101,900	0	101,900
Mar.	380,000	2,523,000	248,000	0	0	0	397	104,200	0	104,200
April	274,000	2,655,000	253,000	0	7,000	0	400	109,000	0	109,000
May	300,000	2,669,000	281,000	0	10,000	0	401	117,500	0	117,500
June	304,000	2,678,000	287,000	0	11,000	0	401	124,200	0	124,200
July	237,000	2,684,000	301,000	0	14,000	0	400	125,400	0	125,400
Aug.	225,000	2,606,000	307,000	0	12,000	0	396	126,700	0	126,700
Sept.	198,000	2,512,000	284,000	0	9,000	0	390	120,000	0	120,000
Oct.	221,000	2,417,000	279,000	0	7,000	0	386	113,400	0	113,400
Nov.	217,000	2,352,000	265,000	21,000	5,000	0	383	110,300	8,800	119,100
Dec.	217,000	2,278,000	274,000	0	0	0	380	109,400	0	109,400
Total or average	3,308,000		3,248,000	21,000	75,000	0	392	113,400	700	114,100
1899										
Jan.	605,000	2,221,000	239,000	0	0	0	388	97,400	0	97,400
Feb.	253,000	2,587,000	222,000	0	0	0	398	101,900	0	101,900
Mar.	900,000	2,618,000	249,000	65,000	0	264,000	404	104,200	27,300	131,500
April	456,000	2,940,000	247,000	174,000	7,000	28,000	411	109,000	76,300	185,300
May	330,000	2,940,000	276,000	44,000	10,000	0	412	117,500	18,800	136,300
June	302,000	2,940,000	282,000	59,000	12,000	7,000	411	124,200	25,700	149,900
July	240,000	2,882,000	298,000	55,000	14,000	0	407	125,400	23,100	148,500
Aug.	224,000	2,755,000	304,000	58,000	13,000	0	400	126,700	24,200	150,900
Sept.	197,000	2,604,000	282,000	40,000	10,000	0	394	120,000	16,900	136,900
Oct.	252,000	2,469,000	278,000	65,000	7,000	0	388	113,400	26,500	139,900
Nov.	645,000	2,371,000	264,000	187,000	5,000	0	386	110,300	77,900	188,200
Dec.	646,000	2,560,000	265,000	243,000	0	0	398	109,400	100,600	210,000
Total or average	5,050,000		3,206,000	990,000	78,000	299,000	400	113,400	34,900	148,300

*Total primary power production in February of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1896
2,256,000	242,000	118,000	0	1,367,000	0	383	97,400	47,200	144,600	Jan.
2,509,000	231,000	51,000	0	50,000	0	396	98,400	22,300	120,700	Feb.
2,651,000	247,000	49,000	0	0	153,000	405	104,200	20,400	124,600	Mar.
2,940,000	249,000	231,000	7,000	0	404,000	408	109,000	101,000	210,000	April
2,940,000	279,000	219,000	10,000	0	686,000	407	117,500	92,500	210,000	May
2,940,000	283,000	196,000	12,000	0	80,000	410	124,200	85,800	210,000	June
2,905,000	298,000	151,000	14,000	0	0	407	125,400	63,700	189,100	July
2,755,000	304,000	102,000	13,000	0	0	400	126,700	42,500	169,200	Aug.
2,604,000	282,000	101,000	10,000	0	0	394	120,000	42,800	162,800	Sept.
2,469,000	278,000	75,000	7,000	0	0	388	113,400	30,500	143,900	Oct.
2,371,000	264,000	161,000	5,000	0	0	385	110,300	66,800	177,100	Nov.
2,413,000	268,000	247,000	0	223,000	0	390	109,400	100,600	210,000	Dec.
	3,225,000	1,701,000	78,000	1,640,000	1,323,000	398	113,000	59,700	172,700	Total or average
										1897
2,595,000	238,000	174,000	0	252,000	0	392	97,400	71,000	168,400	Jan.
2,508,000	228,000	242,000	0	846,000	0	385	101,900	108,100	210,000	Feb.
2,530,000	251,000	130,000	0	75,000	0	398	104,200	53,200	157,400	Mar.
2,811,000	249,000	186,000	7,000	2,000	285,000	408	109,000	81,400	190,400	April
2,940,000	276,000	195,000	10,000	0	73,000	411	117,500	82,500	200,000	May
2,940,000	283,000	73,000	12,000	0	0	410	124,200	32,100	156,300	June
2,882,000	298,000	90,000	14,000	0	0	407	125,400	37,900	163,300	July
2,755,000	305,000	87,000	13,000	0	0	400	126,700	36,200	162,900	Aug.
2,604,000	282,000	90,000	10,000	0	0	394	120,000	38,200	158,200	Sept.
2,469,000	278,000	75,000	7,000	0	0	388	113,400	30,500	143,900	Oct.
2,371,000	265,000	97,000	5,000	0	0	382	110,300	40,300	150,600	Nov.
2,278,000	274,000	113,000	0	0	0	380	109,400	45,200	154,600	Dec.
	3,227,000	1,552,000	78,000	1,175,000	358,000	396	113,400	54,300	167,700	Total or average
										1898
2,257,000	243,000	0	0	0	0	380	97,400	0	97,400	Jan.
2,271,000	226,000	0	0	0	0	388	101,900	0	101,900	Feb.
2,523,000	248,000	0	0	0	0	397	104,200	0	104,200	Mar.
2,655,000	253,000	0	7,000	0	0	400	109,000	0	109,000	April
2,669,000	281,000	0	10,000	0	0	401	117,500	0	117,500	May
2,678,000	287,000	0	11,000	0	0	401	124,200	0	124,200	June
2,684,000	301,000	0	14,000	0	0	400	125,400	0	125,400	July
2,696,000	307,000	0	12,000	0	0	396	126,700	0	126,700	Aug.
2,512,000	284,000	0	9,000	0	0	390	120,000	0	120,000	Sept.
2,417,000	279,000	0	7,000	0	0	386	113,400	0	113,400	Oct.
2,352,000	265,000	21,000	5,000	0	0	383	110,300	8,800	119,100	Nov.
2,278,000	274,000	0	0	0	0	380	109,400	0	109,400	Dec.
	3,248,000	21,000	75,000	0	0	392	113,400	700	114,100	Total or average
										1899
2,221,000	241,000	45,000	0	2,000	0	387	97,400	18,400	115,800	Jan.
2,538,000	223,000	0	0	0	0	396	101,900	0	101,900	Feb.
2,568,000	249,000	57,000	0	278,000	0	399	104,200	23,900	128,100	Mar.
2,884,000	246,000	140,000	7,000	0	7,000	412	109,000	61,500	170,500	April
2,940,000	276,000	44,000	10,000	0	0	412	117,500	18,800	136,300	May
2,940,000	282,000	59,000	12,000	0	7,000	411	124,200	25,700	149,900	June
2,882,000	298,000	55,000	14,000	0	0	407	125,400	23,100	148,500	July
2,755,000	304,000	58,000	13,000	0	0	400	126,700	24,200	150,900	Aug.
2,604,000	282,000	40,000	10,000	0	0	394	120,000	16,900	136,900	Sept.
2,469,000	278,000	65,000	7,000	0	0	388	113,400	26,500	139,900	Oct.
2,371,000	264,000	187,000	5,000	0	0	386	110,300	77,900	188,200	Nov.
2,560,000	266,000	244,000	0	108,000	0	396	109,400	100,600	210,000	Dec.
	3,209,000	994,000	78,000	388,000	14,000	399	113,400	35,000	148,400	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR

BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Esti-mated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evapora-tion in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1900										
Jan.	1,299,000	2,698,000	232,000	247,000	0	578,000	405	97,400	103,500	200,900
Feb.	391,000	2,940,000	217,000	134,000	0	40,000	410	101,900	62,500	164,400
Mar.	912,000	2,940,000	245,000	242,000	0	425,000	410	104,200	102,400	206,600
April	457,000	2,940,000	246,000	183,000	7,000	21,000	412	109,000	80,300	189,300
May	413,000	2,940,000	276,000	110,000	10,000	17,000	412	117,500	46,600	164,100
June	247,000	2,940,000	282,000	11,000	12,000	0	412	124,200	4,900	129 100
July	219,000	2,882,000	297,000	35,000	14,000	0	408	125,400	14,800	140,200
Aug.	208,000	2,755,000	303,000	43,000	13,000	0	402	126,700	17,900	144,600
Sept.	201,000	2,604,000	282,000	44,000	10,000	0	394	120,000	18,800	138,800
Oct.	508,000	2,469,000	278,000	121 000	7,000	0	388	113,400	49,200	162,600
Nov.	368,000	2,371,000	264,000	145,000	5,000	0	384	110,300	59,700	170,000
Dec.	697,000	2,325,000	271,000	222,000	0	0	384	109,400	89,000	198,400
Total or average	5,720,000		3,193,000	1,537,000	78,000	1,081,000	402	113,400	54,200	167,600
1901										
Jan.	895,000	2,529,000	230,000	95,000	0	159,000	406	97,400	39,900	137,300
Feb.	1,304,000	2,940,000	218,000	223,000	0	863,000	408	101,900	104,200	206,100
Mar.	749,000	2,940,000	247,000	246,000	0	256,000	407	104,200	103,800	208,000
April	382,000	2,940,000	246,000	123,000	7,000	6,000	412	109,000	54,000	163,000
May	411,000	2,940,000	276,000	120,000	10,000	5,000	412	117,500	51,100	168,600
June	240,000	2,940,000	282,000	4,000	12,000	0	412	124,200	1,800	126,000
July	218,000	2,882,000	297,000	34,000	14,000	0	408	125,400	14,200	139,600
Aug.	206,000	2,755,000	303,000	41,000	13,000	0	402	126,700	17,100	143,800
Sept.	200,000	2,604,000	282,000	43,000	10,000	0	394	120,000	18,200	138,200
Oct.	215,000	2,469,000	278,000	28,000	7,000	0	388	113,400	11,400	124,800
Nov.	354,000	2,371,000	265,000	103,000	5,000	0	383	110,300	42,500	152,800
Dec.	550,000	2,352,000	272,000	252,000	0	0	383	109,400	100,600	210,000
Total or average	5,724,000		3,196,000	1,312,000	78,000	1,289,000	401	113,400	46,300	159,700
1902										
Jan.	227,000	2,378,000	240,000	0	0	0	386	97,400	0	97,400
Feb.	2,782,000	2,365,000	224,000	153,000	0	1,830,000	392	101,900	69,300	171,200
Mar.	1,115,000	2,940,000	248,000	253,000	0	614,000	404	104,200	105,800	210,000
April	891,000	2,940,000	249,000	232,000	7,000	403,000	408	109,000	101,000	210,000
May	765,000	2,940,000	278,000	216,000	10,000	261,000	409	117,500	91,400	208,900
June	407,000	2,940,000	282,000	164,000	12,000	7,000	410	124,200	71,700	195,900
July	254,000	2,882,000	298,000	69,000	14,000	0	406	125,400	29,000	154,400
Aug.	234,000	2,755,000	304,000	68,000	13,000	0	400	126,700	28,400	155,100
Sept.	184,000	2,604,000	282,000	27,000	10,000	0	394	120,000	11,400	131,400
Oct.	235,000	2,469,000	278,000	48,000	7,000	0	388	113,400	19,500	132,900
Nov.	829,000	2,371,000	258,000	190,000	5,000	0	396	110,300	81,100	191,400
Dec.	762,000	2,747,000	260,000	239,000	0	70,000	407	109,400	100,600	210,000
Total or average	8,685,000		3,201,000	1,659,000	78,000	3,185,000	400	113,400	58,900	172,300
1903										
Jan.	1,113,000	2,940,000	230,000	214,000	0	669,000	409	97,400	90,300	187,700
Feb.	633,000	2,940,000	218,000	231,000	0	184,000	408	101,900	108,100	210,000
Mar.	1,339,000	2,940,000	246,000	252,000	0	841,000	408	104,200	105,800	210,000
April	765,000	2,940,000	250,000	232,000	7,000	276,000	407	109,000	101,000	210,000
May	458,000	2,940,000	276,000	152,000	10,000	20,000	412	117,500	64,700	182,200
June	278,000	2,940,000	282,000	42,000	12,000	0	412	124,200	18,300	142,500
July	231,000	2,882,000	297,000	47,000	14,000	0	408	125,400	19,800	145,200
Aug.	204,000	2,755,000	303,000	39,000	13,000	0	402	126,700	16,300	143,000
Sept.	174,000	2,604,000	282,000	17,000	10,000	0	394	120,000	7,200	127,200
Oct.	199,000	2,469,000	278,000	12,000	7,000	0	388	113,400	4,800	118,200
Nov.	924,000	2,371,000	261,000	156,000	5,000	0	390	110,300	65,600	175,900
Dec.	530,000	2,873,000	259,000	238,000	0	0	408	109,400	100,600	210,000
Total or average	6,848,000		3,182,000	1,632,000	78,000	1,990,000	404	113,400	58,200	171,600

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1900
2,588,000	240,000	274,000	0	883,000	0	388	97,400	110,900	208,300	Jan.
2,490,000	224,000	49,000	0	29,000	0	394	101,900	22,000	123,900	Feb.
2,579,000	250,000	107,000	0	316,000	0	400	104,200	43,800	148,000	Mar.
2,818,000	247,000	77,000	7,000	0	4,000	411	109,000	33,900	142,900	April
2,940,000	276,000	110,000	10,000	0	17,000	412	117,500	46,600	164,100	May
2,940,000	282,000	11,000	12,000	0	0	412	124,200	4,900	129,100	June
2,882,000	297,000	35,000	14,000	0	0	408	125,400	14,800	140,200	July
2,755,000	303,000	43,000	13,000	0	0	402	126,700	17,900	144,600	Aug.
2,604,000	282,000	44,000	10,000	0	0	394	120,000	18,800	138,800	Sept.
2,469,000	278,000	121,000	7,000	0	0	388	113,400	49,200	162,600	Oct.
2,371,000	264,000	145,000	5,000	0	0	384	110,300	59,700	170,000	Nov.
2,325,000	271,000	222,000	0	0	0	384	109,400	89,000	198,400	Dec.
	3,214,000	1,238,000	78,000	1,228,000	21,000	398	113,400	42,900	156,300	Total or average
										1901
2,529,000	239,000	251,000	0	446,000	0	389	97,400	101,600	199,000	Jan.
2,488,000	227,000	223,000	0	801,000	0	386	101,900	99,400	201,300	Feb.
2,541,000	251,000	128,000	0	155,000	0	398	104,200	52,400	156,600	Mar.
2,756,000	249,000	0	7,000	0	0	408	109,000	0	109,000	April
2,882,000	276,000	67,000	10,000	0	0	412	117,500	28,500	146,000	May
2,940,000	282,000	4,000	12,000	0	0	412	124,200	1,800	126,000	June
2,882,000	297,000	34,000	14,000	0	0	408	125,400	14,200	139,600	July
2,755,000	303,000	41,000	13,000	0	0	402	126,700	17,100	143,800	Aug.
2,604,000	282,000	43,000	10,000	0	0	394	120,000	18,200	138,200	Sept.
2,469,000	278,000	28,000	7,000	0	0	388	113,400	11,400	124,800	Oct.
2,371,000	265,000	103,000	5,000	0	0	383	110,300	42,500	152,800	Nov.
2,352,000	272,000	252,000	0	0	0	383	109,400	100,600	210,000	Dec.
	3,221,000	1,174,000	78,000	1,402,000	0	397	113,400	40,400	153,800	Total or average
										1902
2,378,000	240,000	0	0	0	0	386	97,400	0	97,400	Jan.
2,365,000	230,000	176,000	0	2,175,000	0	381	101,900	77,100	179,000	Feb.
2,566,000	251,000	183,000	0	409,000	0	398	104,200	75,300	179,500	Mar.
2,838,000	249,000	187,000	7,000	0	346,000	408	109,000	81,500	190,500	April
2,940,000	278,000	216,000	10,000	0	261,000	409	117,500	91,400	208,900	May
2,940,000	282,000	164,000	12,000	0	7,000	410	124,200	71,700	195,900	June
2,882,000	298,000	69,000	14,000	0	0	406	125,400	29,000	154,400	July
2,755,000	304,000	68,000	13,000	0	0	400	126,700	28,400	155,100	Aug.
2,604,000	282,000	27,000	10,000	0	0	394	120,000	11,400	131,400	Sept.
2,469,000	278,000	48,000	7,000	0	0	388	113,400	19,500	132,900	Oct.
2,371,000	258,000	190,000	5,000	0	0	396	110,300	81,100	191,400	Nov.
2,747,000	264,000	241,000	0	352,000	0	400	109,400	100,600	210,000	Dec.
	3,214,000	1,569,000	78,000	2,936,000	614,000	398	113,400	55,300	168,700	Total or average
										1903
2,652,000	240,000	264,000	0	772,000	0	388	97,400	106,900	204,300	Jan.
2,489,000	226,000	222,000	0	126,000	0	390	101,900	100,100	202,000	Feb.
2,548,000	253,000	242,000	0	580,000	0	394	104,200	99,600	203,800	Mar.
2,812,000	249,000	225,000	7,000	46,000	110,000	408	109,000	98,100	207,100	April
2,940,000	276,000	152,000	10,000	0	20,000	412	117,500	64,700	182,200	May
2,940,000	282,000	42,000	12,000	0	0	412	124,200	18,300	142,500	June
2,882,000	297,000	47,000	14,000	0	0	408	125,400	19,800	145,200	July
2,755,000	303,000	39,000	13,000	0	0	402	126,700	16,300	143,000	Aug.
2,604,000	282,000	17,000	10,000	0	0	394	120,000	7,200	127,200	Sept.
2,469,000	278,000	12,000	7,000	0	0	388	113,400	4,800	118,200	Oct.
2,371,000	261,000	156,000	5,000	0	0	390	110,300	65,600	175,900	Nov.
2,873,000	263,000	229,000	0	310,000		400	109,400	95,300	204,700	Dec.
	3,210,000	1,647,000	78,000	1,834,000	130,000	399	113,400	57,800	171,200	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1904										
Jan.	473,000	2,906,000	229,000	188,000	0	22,000	412	97,400	80,000	177,400
Feb.	1,742,000	2,940,000	217,000	204,000	0	1,321,000	410	98,400	92,400	190,800
Mar.	2,877,000	2,940,000	248,000	254,000	0	2,375,000	403	104,200	105,800	210,000
April	1,467,000	2,940,000	252,000	235,000	7,000	973,000	402	109,000	101,000	210,000
May	914,000	2,940,000	279,000	220,000	10,000	405,000	406	117,500	92,500	210,000
June	505,000	2,940,000	283,000	196,000	12,000	48,000	410	124,200	85,800	210,000
July	377,000	2,906,000	298,000	201,000	14,000	0	406	125,400	84,600	210,000
Aug.	282,000	2,770,000	304,000	131,000	13,000	0	400	126,700	54,600	181,300
Sept.	271,000	2,604,000	282,000	114,000	10,000	0	393	120,000	48,300	168,300
Oct.	491,000	2,469,000	276,000	201,000	7,000	0	391	113,400	81,900	195,300
Nov.	379,000	2,476,000	263,000	241,000	5,000	0	386	110,300	99,700	210,000
Dec.	600,000	2,346,000	273,000	252,000	0	0	381	109,400	100,600	210,000
Total or average	10,378,000		3,204,000	2,437,000	78,000	5,144,000	400	113,000	85,600	198,600
1905										
Jan.	1,371,000	2,421,000	234,000	87,000	0	531,000	400	97,400	36,300	133,700
Feb.	1,027,000	2,940,000	218,000	231,000	0	578,000	408	101,900	108,100	210,000
Mar.	1,335,000	2,940,000	247,000	252,000	0	836,000	406	104,200	105,800	210,000
April	753,000	2,940,000	250,000	232,000	7,000	264,000	407	109,000	101,000	210,000
May	560,000	2,940,000	276,000	207,000	10,000	67,000	411	117,500	87,600	205,100
June	365,000	2,940,000	283,000	128,000	12,000	0	410	124,200	56,100	180,300
July	269,000	2,882,000	298,000	84,000	14,000	0	407	125,400	35,500	160,900
Aug.	236,000	2,755,000	304,000	70,000	13,000	0	400	126,700	29,200	155,900
Sept.	208,000	2,604,000	282,000	51,000	10,000	0	394	120,000	21,700	141,700
Oct.	221,000	2,469,000	278,000	34,000	7,000	0	388	113,400	13,800	127,200
Nov.	229,000	2,371,000	264,000	53,000	5,000	0	384	110,300	21,900	132,200
Dec.	249,000	2,278,000	270,000	0	0	0	380	109,400	0	109,400
Total or average	6,823,000		3,204,000	1,429,000	78,000	2,276,000	400	113,400	51,000	164.400
1906										
Jan.	851,000	2,257,000	237,000	0	0	0	393	97,400	0	97,400
Feb.	872,000	2,871,000	217,000	139,000	0	447,000	409	101,900	64,700	166,600
Mar.	1,646,000	2,940,000	247,000	252,000	0	1,147,000	406	104,200	105,800	210,000
April	995,000	2,940,000	250,000	233,000	7,000	505,000	406	109,000	101,000	210,000
May	817,000	2,940,000	278,000	220,000	10,000	309,000	408	117,500	92,500	210,000
June	756,000	2,940,000	284,000	196,000	12,000	265,000	409	124,200	85,800	210,000
July	362,000	2,939,000	297,000	201,000	14,000	0	408	125,400	84,600	210,000
Aug.	280,000	2,789,000	304,000	148,000	13,000	0	400	126,700	61,700	188,400
Sept.	247,000	2,604,000	283,000	89,000	10,000	0	394	120,000	37,800	157,800
Oct.	251,000	2,469,000	278,000	64,000	7,000	0	388	113,400	26,100	139,500
Nov.	256,000	2,371,000	265,000	79,000	5,000	0	383	110,300	32,800	143,100
Dec.	648,000	2,278,000	272,000	186,000	0	0	382	109,400	74,300	183,700
Total or average	7,981,000		3,212,000	1,807,000	78,000	2,673,000	399	113,400	63,900	177,300
1907										
Jan.	936,000	2,468,000	231,000	44,000	0	189,000	406	97,400	18,500	115,900
Feb.	1,636,000	2,940,000	218,000	231,000	0	1,187,000	408	101,900	108,100	210,000
Mar.	2,115,000	2,940,000	249,000	254,000	0	1,612,000	402	104,200	105,800	210,000
April	1,250,000	2,940,000	251,000	234,000	7,000	758,000	404	109,000	101,000	210,000
May	646,000	2,940,000	278,000	219,000	10,000	139,000	408	117,500	92,500	210,000
June	421,000	2,940,000	282,000	179,000	12,000	6,000	410	124,200	78,200	202,400
July	334,000	2,882,000	298,000	149,000	14,000	0	406	125,400	62,600	188,000
Aug.	291,000	2,755,000	304,000	125,000	13,000	0	400	126,700	52,000	178,700
Sept.	252,000	2,604,000	282,000	95,000	10,000	0	394	120,000	40,300	160,300
Oct.	261,000	2,469,000	278,000	74,000	7,000	0	388	113,400	30,100	143,500
Nov.	256,000	2,371,000	264,000	80,000	5,000	0	384	110,300	33,300	143,600
Dec.	479,000	2,278,000	273,000	138,000	0	0	380	109,400	55,100	164,500
Total or average	8,877,000		3,208,000	1,822,000	78,000	3,891,000	399	113,400	64,500	177,900

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1904
2,601,000	238,000	232,000	0	83,000	0	392	97,400	94,500	191,900	Jan.
2,521,000	236,000	165,000	0	1,332,000	0	386	98,400	70,500	168,900	Feb.
2,530,000	256,000	262,000	0	2,031,000	0	387	104,200	105,800	210,000	Mar.
2,858,000	250,000	234,000	7,000	146,000	748,000	405	109,000	101,000	210,000	April
2,940,000	279,000	220,000	10,000	0	405,000	406	117,500	92,500	210,000	May
2,940,000	283,000	196,000	12,000	0	48,000	410	124,200	85,800	210,000	June
2,906,000	298,000	201,000	14,000	0	0	406	125,400	84,600	210,000	July
2,770,000	304,000	131,000	13,000	0	0	400	126,700	54,600	181,300	Aug.
2,604,000	282,000	114,000	10,000	0	0	393	120,000	48,300	168,300	Sept.
2,469,000	276,000	201,000	7,000	0	0	391	113,400	81,900	195,300	Oct.
2,476,000	263,000	241,000	5,000	0	0	386	110,300	99,700	210,000	Nov.
2,346,000	273,000	252,000	0	0	0	381	109,400	100,600	210,000	Dec.
	3,238,000	2,449,000	78,000	3,592,000	1,201,000	395	113,000	85,100	198,100	Total or average
										1905
2,421,000	238,000	179,000	0	743,000	0	391	97,400	72,600	170,000	Jan.
2,632,000	224,000	229,000	0	607,000	0	393	101,900	103,600	205,500	Feb.
2,539,030	251,000	238,000	0	524,000	0	398	104,200	98,400	202,600	Mar.
2,921,000	249,000	231,000	7,000	29,000	218,000	408	109,000	101,000	210,000	April
2,940,000	276,000	207,000	10,000	0	67,000	411	117,500	87,600	205,100	May
2,940,000	283,000	128,000	12,000	0	0	410	124,200	56,100	180,300	June
2,882,000	298,000	84,000	14,000	0	0	407	125,400	35,500	160,900	July
2,755,000	304,000	70,000	13,000	0	0	400	126,700	29,200	155,900	Aug.
2,604,000	282,000	51,000	10,000	0	0	394	120,000	21,700	141,700	Sept.
2,469,000	278,000	34,000	7,000	0	0	388	113,400	13,800	127,200	Oct.
2,371,000	264,000	53,000	5,000	0	0	384	110,300	21,900	132,200	Nov.
2,278,000	270,000	0	0	0	0	380	109,400	0	109,400	Dec.
	3,217,000	1,504,000	78,000	1,903,000	285,000	397	113,400	53,100	166,500	Total or average
										1906
2,257,000	239,000	52,000	0	109,000	0	390	97,400	21,600	119,000	Jan.
2,708,000	222,000	141,000	0	611,000	0	398	101,900	63,700	165,600	Feb.
2,606,000	253,000	241,000	0	924,000	0	394	104,200	98,900	203,100	Mar.
2,834,000	249,000	232,000	7,000	136,000	235,000	408	109,000	101,000	210,000	April
2,940,000	278,000	220,000	10,000	0	309,000	408	117,500	92,500	210,000	May
2,940,000	284,000	196,000	12,000	0	265,000	409	124,200	85,800	210,000	June
2,939,000	297,000	201,000	14,000	0	0	408	125,400	84,600	210,000	July
2,789,000	304,000	148,000	13,000	0	0	400	126,700	61,700	188,400	Aug.
2,604,000	283,000	89,000	10,000	0	0	394	120,000	37,800	157,800	Sept.
2,469,000	278,000	64,000	7,000	0	0	388	113,400	26,100	139,500	Oct.
2,371,000	265,000	79,000	5,000	0	0	383	110,300	32,800	143,100	Nov.
2,278,000	272,000	186,000	0	0	0	382	109,400	74,300	183,700	Dec.
	3,224,000	1,849,000	78,000	1,780,000	839,000	397	113,400	65,100	178,500	Total or average
										1907
2,468,000	239,000	247,000	0	430,000	0	389	97,400	100,300	197,700	Jan.
2,488,000	229,000	243,000	0	1,122,000	0	384	101,900	108,100	210,000	Feb.
2,530,000	254,000	259,000	0	1,314,000	0	392	104,200	105,800	210,000	Mar.
2,818,000	249,000	234,000	7,000	178,000	460,000	406	109,000	101,000	210,000	April
2,940,000	278,000	219,000	10,000	0	139,000	408	117,500	92,500	210,000	May
2,940,000	282,000	179,000	12,000	0	6,000	410	124,200	78,200	202,400	June
2,882,000	298,000	149,000	14,000	0	0	406	125,400	62,600	188,000	July
2,755,000	304,000	125,000	13,000	0	0	400	126,700	52,000	178,700	Aug.
2,604,000	282,000	95,000	10,000	0	0	394	120,000	40,300	160,300	Sept.
2,469,000	278,000	74,000	7,000	0	0	388	113,400	30,100	143,500	Oct.
2,371,000	264,000	80,000	5,000	0	0	384	110,300	33,300	143,600	Nov.
2,278,000	273,000	138,000	0	0	0	380	109,400	55,100	164,500	Dec.
	3,230,000	2,042,000	78,000	3,044,000	605,000	395	113,400	71,400	184,800	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1908										
Jan.	904,000	2,346,000	234,000	48,000	0	28,000	400	97,400	20,200	117,600
Feb.	970,000	2,940,000	217,000	246,000	0	507,000	409	98,400	111,600	210,000
Mar.	669,000	2,940,000	246,000	251,000	0	172,000	408	104,200	105,800	210,000
April	527,000	2,940,000	247,000	225,000	7,000	48,000	411	109,000	98,100	207,100
May	492,000	2,940,000	276,000	187,000	10,000	19,000	411	117,500	79,600	197,100
June	340,000	2,940,000	283,000	103,000	12,000	0	410	124,200	45,100	169,300
July	260,000	2,882,000	298,000	75,000	14,000	0	407	125,400	31,600	157,000
Aug.	229,000	2,755,000	304,000	63,000	13,000	0	400	126,700	26,200	152,900
Sept.	205,000	2,604,000	282,000	48,000	10,000	0	394	120,000	20,400	140,400
Oct.	235,000	2,469,000	278,000	48,000	7,000	0	388	113,400	19,500	132,900
Nov.	257,000	2,371,000	264,000	81,000	5,000	0	384	110,300	33,800	144,100
Dec.	267,000	2,278,000	273,000	15,000	0	0	380	109,400	5,900	115,300
Total or average	5,355,000		3,202,000	1,390,000	78,000	774,000	400	113,000	49,500	162,500
1909										
Jan.	3,260,000	2,257,000	236,000	185,000	0	2,156,000	396	97,400	76,200	173,600
Feb.	2,526,000	2,940,000	221,000	235,000	0	2,070,000	400	101,900	108,100	210,000
Mar.	977,000	2,940,000	248,000	253,000	0	476,000	404	104,200	105,800	210,000
April	756,000	2,940,000	249,000	231,000	7,000	269,000	408	109,000	101,000	210,000
May	581,000	2,940,000	276,000	216,000	10,000	79,000	410	117,500	91,500	209,000
June	410,000	2,940,000	282,000	171,000	12,000	3,000	410	124,200	74,900	199,100
July	308,000	2,882,000	298,000	123,000	14,000	0	406	125,400	51,700	177,100
Aug.	264,000	2,755,000	304,000	98,000	13,000	0	400	126,700	40,900	167,600
Sept.	246,000	2,604,000	282,000	89,000	10,000	0	394	120,000	37,800	157,800
Oct.	284,000	2,469,000	278,000	97,000	7,000	0	388	113,400	39,400	152,800
Nov.	538,000	2,371,000	264,000	174,000	5,000	0	384	110,300	72,500	182,800
Dec.	721,000	2,466,000	265,000	244,000	0	0	396	109,400	100,600	210,000
Total or average	10,871,000		3,203,000	2,116,000	78,000	5,053,000	400	113,400	74,800	188,200
1910										
Jan.	708,000	2,678,000	231,000	69,000	000	146,000	407	97,400	29,000	126,400
Feb.	847,000	2,940,000	217,000	230,000	0	400,000	410	101,900	108,100	210,000
Mar.	1,239,000	2,940,000	247,000	251,000	0	741,000	407	104,200	105,800	210,000
April	665,000	2,940,000	249,000	232,000	7,000	177,000	408	109,000	101,000	210,000
May	415,000	2,940,000	276,000	128,000	10,000	1,000	412	117,500	54,400	171,900
June	282,000	2,940,000	282,000	46,000	12,000	0	412	124,200	20,100	144,300
July	254,000	2,882,000	297,000	70,000	14,000	0	408	125,400	29,400	154,800
Aug.	236,000	2,755,000	304,000	70,000	13,000	0	400	126,700	29,200	155,900
Sept.	214,000	2,604,000	282,000	57,000	10,000	0	394	120,000	24,200	144,200
Oct.	231,000	2,469,000	278,000	44,000	7,000	0	388	113,400	17,900	131,300
Nov.	274,000	2,371,000	265,000	97,000	5,000	0	383	110,300	40,300	150,600
Dec.	436,000	2,278,000	273,000	184,000	0	0	380	109,400	73,400	182,800
Total or average	5,801,000		3,201,000	1,478,000	78,000	1,465,000	401	113,400	52,300	165,700
1911										
Jan.	700,000	2,257,000	240,000	0	0	0	385	97,400	0	97,400
Feb.	848,000	2,717,000	217,000	187,000	0	221,000	409	101,900	88,100	190,000
Mar.	1,278,000	2,940,000	246,000	248,000	0	784,000	408	104,200	104,400	208,600
April	962,000	2,940,000	250,000	232,000	7,000	473,000	406	109,000	101,000	210,000
May	671,000	2,940,000	278,000	219,000	10,000	164,000	408	117,500	92,500	210,000
June	431,000	2,940,000	282,000	182,000	12,000	13,000	410	124,200	79,600	203,800
July	287,000	2,882,000	298,000	102,000	14,000	0	406	125,400	42,900	168,300
Aug.	244,000	2,755,000	304,000	78,000	13,000	0	400	126,700	32,500	159,200
Sept	231,000	2,604,000	282,000	74,000	10,000	0	394	120,000	30,700	150,700
Oct.	246,000	2,469,000	278,000	59,000	7,000	0	388	113,400	24,100	137,500
Nov.	241,000	2,371,000	264,000	65,000	5,000	0	384	110,300	26,900	137,200
Dec.	244,000	2,278,000	273,000	0	0	0	380	109,400	0	109,400
Total or average	6,383,000		3,212,000	1,446,000	78,000	1,655,000	398	113,400	51,500	164,900

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1908
2,346,000	237,000	94,000	0	264,000	0	394	97,400	38,300	135,700	Jan.
2,655,000	234,000	210,000	0	629,000	0	388	98,400	90,800	189,200	Feb.
2,552,000	250,000	88,000	0	37,000	0	401	104,200	36,300	140,500	Mar.
2,846,000	247,000	134,000	7,000	0	45,000	411	109,000	58,300	167,300	April
2,940,000	276,000	187,000	10,000	0	19,000	411	117,500	79,600	197,100	May
2,940,000	283,000	103,000	12,000	0	0	410	124,200	45,100	169,300	June
2,882,000	298,000	75,000	14,000	0	0	407	125,400	31,600	157,000	July
2,755,000	304,000	63,000	13,000	0	0	400	126,700	26,200	152,900	Aug.
2,604,000	282,000	48,000	10,000	0	0	394	120,000	20,400	140,400	Sept.
2,469,000	278,000	48,000	7,000	0	0	388	113,400	19,500	132,900	Oct.
2,371,000	264,000	81,000	5,000	0	0	384	110,300	33,800	144,100	Nov.
2,278,000	273,000	15,000	0	0	0	380	109,400	5,900	115,300	Dec.
	3,226,000	1,146,000	78,000	930,000	64,000	398	113,000	40,200	153,200	Total or average
										1909
2,257,000	242,000	218,000	0	2,551,000	0	383	97,400	87,100	184,500	Jan.
2,506,000	227,000	242,000	0	1,938,000	0	386	101,900	108,100	210,000	Feb.
2,625,000	249,000	197,000	0	247,000	0	401	104,200	81,700	185,900	Mar.
2,909,000	249,000	229,000	7,000	10,000	230,000	409	109,000	100,100	209,100	April
2,940,000	276,000	216,000	10,000	0	79,000	410	117,500	91,500	209,000	May
2,940,000	282,000	171,000	12,000	0	3,000	410	124,200	74,900	199,100	June
2,882,000	298,000	123,000	14,000	0	0	406	125,400	51,700	177,100	July
2,755,000	304,000	98,000	13,000	0	0	400	126,700	40,900	167,600	Aug.
2,604,000	282,000	89,000	10,000	0	0	394	120,000	37,800	157,800	Sept.
2,469,000	278,000	97,000	7,000	0	0	388	113,400	39,400	152,800	Oct.
2,371,000	264,000	174,000	5,000	0	0	384	110,300	72,500	182,800	Nov.
2,466,000	266,000	245,000	0	39,000	0	395	109,400	100,600	210,000	Dec.
	3,217,000	2,099,000	78,000	4,785,000	312,000	397	113,400	73,600	187,000	Total or average
										1910
2,637,000	235,000	139,000	0	327,000	0	398	97,400	57,000	154,400	Jan.
2,644,000	221,000	138,000	0	358,000	0	399	101,900	62,900	164,800	Feb.
2,774,000	247,000	239,000	0	351,000	236,000	406	104,200	100,400	204,600	Mar.
2,940,000	249,000	232,000	7,000	0	177,000	408	109,000	101,000	210,000	April
2,940,000	276,000	128,000	10,000	0	1,000	412	117,500	54,400	171,900	May
2,940,000	282,000	46,000	12,000	0	0	412	124,200	20,100	144,300	June
2,882,000	297,000	70,000	14,000	0	0	408	125,400	29,400	154,800	July
2,755,000	304,000	70,000	13,000	0	0	400	126,700	29,200	155,900	Aug.
2,604,000	282,000	57,000	10,000	0	0	394	120,000	24,200	144,200	Sept.
2,469,000	278,000	44,000	7,000	0	0	388	113,400	17,900	131,300	Oct.
2,371,000	265,000	97,000	5,000	0	0	383	110,300	40,300	150,600	Nov.
2,278,000	274,000	183,000	0	0	0	380	109,400	73,000	182,400	Dec.
	3,210,000	1,443,000	78,000	1,036,000	414,000	399	113,400	50,800	164,200	Total or average
										1911
2,257,000	241,000	18,000	0	193,000	0	384	97,400	7,300	104,700	Jan.
2,505,000	226,000	168,000	0	377,000	0	389	101,900	75,000	176,900	Feb.
2,582,000	253,000	246,000	0	548,000	0	395	104,200	100,900	205,100	Mar.
2,813,000	249,000	232,000	7,000	99,000	248,000	407	109,000	101,000	210,000	April
2,940,000	278,000	219,000	10,000	0	164,000	408	117,500	92,500	210,000	May
2,940,000	282,000	182,000	12,000	0	13,000	410	124,200	79,600	203,800	June
2,882,000	298,000	102,000	14,000	0	0	406	125,400	42,900	168,300	July
2,755,000	304,000	78,000	13,000	0	0	400	126,700	32,500	159,200	Aug.
2,604,000	282,000	74,000	10,000	0	0	394	120,000	30,700	150,700	Sept.
2,469,000	278,000	59,000	7,000	0	0	388	113,400	24,100	137,500	Oct.
2,371,000	264,000	65,000	5,000	0	0	384	110,300	26,900	137,200	Nov.
2,278,000	273,000	0	0	0	0	380	109,400	0	109,400	Dec.
	3,228,000	1,443,000	78,000	1,217,000	425,000	396	113,400	50,800	164,200	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Esti-mated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evapora-tion in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1912										
Jan.	517,000	2,249,000	239,000	0	0	0	388	97,400	0	97,400
Feb.	396,000	2,527,000	221,000	0	0	0	399	98,400	0	98,400
Mar.	635,000	2,702,000	246,000	118,000	0	33,000	409	104,200	50,300	154,500
April	487,000	2,940,000	247,000	182,000	7,000	51,000	411	109,000	80,000	189,000
May	714,000	2,940,000	277,000	217,000	10,000	210,000	410	117,500	91,900	209,400
June	405,000	2,940,000	282,000	158,000	12,000	11,000	411	124,200	69,000	193,200
July	274,000	2,882,000	298,000	89,000	14,000	0	406	125,400	37,500	162,900
Aug.	238,000	2,755,000	304,000	72,000	13,000	0	400	126,700	30,000	156,700
Sept.	242,000	2,604,000	282,000	85,000	10,000	0	394	120,000	36,000	156,000
Oct.	226,000	2,469,000	278,000	39,000	7,000	0	388	113,400	15,900	129,300
Nov.	432,000	2,371,000	264,000	210,000	5,000	0	385	110,300	87,100	197,400
Dec.	369,000	2,324,000	273,000	163,000	0	0	380	109,400	64,500	173,900
Total or average	4,935,000		3,211,000	1,333,000	78,000	305,000	398	113,000	46,900	159,900
1913										
Jan.	763,000	2,257,000	237,000	0	0	0	392	97,400	0	97,400
Feb.	387,000	2,783,000	216,000	14,000	0	0	411	101,900	6,400	108,300
Mar.	441,000	2,940,000	243,000	179,000	0	19,000	413	104,200	76,200	180,400
April	685,000	2,940,000	247,000	231,000	7,000	200,000	411	109,000	101,000	210,000
May	521,000	2,940,000	276,000	201,000	10,000	34,000	411	117,500	85,500	203,000
June	321,000	2,940,000	283,000	84,000	12,000	0	410	124,200	36,800	161,000
July	263,000	2,882,000	298,000	78,000	14,000	0	407	125,400	32,800	158,200
Aug.	232,000	2,755,000	304,000	66,000	13,000	0	400	126,700	27,600	154,300
Sept.	190,000	2,604,000	282,000	33,000	10,000	0	394	120,000	14,000	134,000
Oct.	202,000	2,469,000	278,000	15,000	7,000	0	388	113,400	6,000	119,400
Nov.	316,000	2,371,000	265,000	105,000	5,000	0	383	110,300	43,600	153,900
Dec.	696,000	2,312,000	272,000	183,000	0	0	381	109,400	72,900	182,300
Total or average	5,017,000		3,201,000	1,189,000	78,000	253,000	400	113,400	42,100	155,500
1914										
Jan.	2,797,000	2,553,000	233,000	255,000	0	1,922,000	401	97,400	105,500	202,900
Feb.	1,359,000	2,940,000	220,000	234,000	0	905,000	402	101,900	108,100	210,000
Mar.	987,000	2,940,000	247,000	252,000	0	488,000	406	104,200	105,800	210,000
April	1,137,000	2,940,000	250,000	232,000	7,000	648,000	407	109,000	101,000	210,000
May	703,000	2,940,000	278,000	220,000	10,000	195,000	408	117,500	92,500	210,000
June	452,000	2,940,000	283,000	196,000	12,000	13,000	410	124,200	85,800	210,000
July	309,000	2,888,000	298,000	130,000	14,000	0	406	125,400	54,800	180,200
Aug.	248,000	2,755,000	304,000	82,000	13,000	0	400	126,700	34,100	160,800
Sept.	225,000	2,604,000	282,000	68,000	10,000	0	394	120,000	28,800	148,800
Oct.	269,000	2,469,000	278,000	82,000	7,000	0	388	113,400	33,200	146,600
Nov.	252,000	2,371,000	265,000	75,000	5,000	0	383	110,300	31,100	141,400
Dec.	347,000	2,278,000	273,000	95,000	0	0	380	109,400	37,900	147,300
Total or average	9,085,000		3,211,000	1,921,000	78,000	4,171,000	399	113,400	68,000	181,400
1915										
Jan.	895,000	2,257,000	237,000	0	0	0	394	97,400	0	97,400
Feb.	2,298,000	2,915,000	221,000	235,000	0	1,817,000	400	101,900	108,100	210,000
Mar.	1,264,000	2,940,000	248,000	254,000	0	762,000	403	104,200	105,800	210,000
April	1,159,000	2,940,000	250,000	233,000	7,000	669,000	406	109,000	101,000	210,000
May	1,256,000	2,940,000	279,000	220,000	10,000	747,000	406	117,500	92,500	210,000
June	572,000	2,940,000	283,000	195,000	12,000	99,000	410	124,200	85,800	210,000
July	343,000	2,923,000	298,000	199,000	14,000	0	406	125,400	83,900	209,300
Aug.	266,000	2,755,000	304,000	100,000	13,000	0	400	126,700	41,700	168,400
Sept.	215,000	2,604,000	282,000	58,000	10,000	0	394	120,000	24,700	144,700
Oct.	233,000	2,469,000	278,000	46,000	7,000	0	388	113,400	18,700	132,100
Nov.	254,000	2,371,000	264,000	78,000	5,000	0	383	110,300	32,400	142,700
Dec.	699,000	2,278,000	270,000	235,000	0	0	387	109,400	94,900	204,300
Total or average	9,454,000		3,214,000	1,853,000	78,000	4,094,000	398	113,400	65,500	178,900

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1912
2,249,000	239,000	0	0	0	0	388	97,400	0	97,400	Jan.
2,527,000	221,000	0	0	0	0	399	98,400	0	98,400	Feb.
2,702,000	246,000	118,000	0	0	33,000	409	104,200	50,300	154,500	Mar.
2,940,000	247,000	182,000	7,000	0	51,000	411	109,000	80,000	189,000	April
2,940,000	277,000	217,000	10,000	0	210,000	410	117,500	91,900	209,400	May
2,940,000	282,000	158,000	12,000	0	11,000	411	124,200	69,000	193,200	June
2,882,000	298,000	89,000	14,000	0	0	406	125,400	37,500	162,900	July
2,755,000	304,000	72,000	13,000	0	0	400	126,700	30,000	156,700	Aug.
2,604,000	282,000	85,000	10,000	0	0	394	120,000	36,000	156,000	Sept.
2,469,000	278,000	39,000	7,000	0	0	388	113,400	15,900	129,300	Oct.
2,371,000	264,000	210,000	5,000	0	0	385	110,300	87,100	197,400	Nov.
2,324,000	273,000	163,000	0	0	0	380	109,400	64,500	173,900	Dec.
	3,211,000	1,333,000	78,000	0	305,000	398	113,000	46,900	159,900	Total or average
										1913
2,257,000	240,000	111,000	0	137,000	0	386	97,400	45,000	142,400	Jan.
2,532,000	222,000	17,000	0	0	0	399	101,900	7,600	109,500	Feb.
2,680,000	247,000	0	0	0	0	406	104,200	0	104,200	Mar.
2,874,000	249,000	200,000	7,000	0	163,000	409	109,000	87,600	196,600	April
2,940,000	276,000	201,000	10,000	0	34,000	411	117,500	85,500	203,000	May
2,940,000	283,000	84,000	12,000	0	0	410	124,200	36,800	161,000	June
2,882,000	298,000	78,000	14,000	0	0	407	125,400	32,800	158,200	July
2,755,000	304,000	66,000	13,000	0	0	400	126,700	27,600	154,300	Aug.
2,604,000	282,000	33,000	10,000	0	0	394	120,000	14,000	134,000	Sept.
2,469,000	278,000	15,000	7,000	0	0	388	113,400	6,000	119,400	Oct.
2,371,000	265,000	105,000	5,000	0	0	383	110,300	43,600	153,900	Nov.
2,312,000	272,000	183,000	0	0	0	381	109,400	72,900	182,300	Dec.
	3,216,000	1,093,000	78,000	137,000	197,000	398	113,400	38,500	151,900	Total or average
										1914
2,553,000	238,000	258,000	0	2,075,000	0	392	97,400	105,200	202,600	Jan.
2,779,000	224,000	237,000	0	903,000	0	394	101,900	108,100	210,000	Feb.
2,774,000	249,000	240,000	0	374,000	0	402	104,200	99,600	203,800	Mar.
2,898,000	249,000	231,000	7,000	6,000	602,000	407	109,000	100,700	209,700	April
2,940,000	278,000	220,000	10,000	0	195,000	408	117,500	92,500	210,000	May
2,940,000	283,000	196,000	12,000	0	13,000	410	124,200	85,800	210,000	June
2,888,000	298,000	130,000	14,000	0	0	406	125,400	54,800	180,200	July
2,755,000	304,000	82,000	13,000	0	0	400	126,700	34,100	160,800	Aug.
2,604,000	282,000	68,000	10,000	0	0	394	120,000	28,800	148,800	Sept.
2,469,000	278,000	82,000	7,000	0	0	388	113,400	33,200	146,600	Oct.
2,371,000	265,000	75,000	5,000	0	0	383	110,300	31,100	141,400	Nov.
2,278,000	273,000	95,000	0	0	0	380	109,400	37,900	147,300	Dec.
	3,221,000	1,914,000	78,000	3,358,000	810,000	397	113,400	67,400	180,800	Total or average
										1915
2,257,000	239,000	101,000	0	324,000	0	388	97,400	40,900	138,300	Jan.
2,488,000	228,000	242,000	0	1,625,000	0	386	101,900	108,100	210,000	Feb.
2,691,000	250,000	256,000	0	522,000	0	399	104,200	105,800	210,000	Mar.
2,927,000	249,000	234,000	7,000	38,000	618,000	405	109,000	101,000	210,000	April
2,940,000	279,000	220,000	10,000	0	747,000	406	117,500	92,500	210,000	May
2,940,000	283,000	195,000	12,000	0	99,000	410	124,200	85,800	210,000	June
2,923,000	298,000	199,000	14,000	0	0	406	125,400	83,900	209,300	July
2,755,000	304,000	100,000	13,000	0	0	400	126,700	41,700	168,400	Aug.
2,604,000	282,000	58,000	10,000	0	0	394	120,000	24,700	144,700	Sept.
2,469,000	278,000	46,000	7,000	0	0	388	113,400	18,700	132,100	Oct.
2,371,000	264,000	78,000	5,000	0	0	384	110,300	32,400	142,700	Nov.
2,278,000	270,000	235,000	0	0	0	387	109,400	94,900	204,300	Dec.
	3,224,000	1,964,000	78,000	2,509,000	1,464,000	396	113,400	69,000	182,400	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1916										
Jan.	1,166,000	2,472,000	232,000	78,000	0	388,000	403	97,400	32,700	130,100
Feb.	1,616,000	2,940,000	219,000	248,000	0	1,149,000	406	98,400	111,600	210,000
Mar.	1,215,000	2,940,000	248,000	252,000	0	715,000	404	104,200	105,800	210,000
April	678,000	2,940,000	251,000	230,000	7,000	190,000	408	109,000	100,300	209,300
May	485,000	2,940,000	276,000	173,000	10,000	26,000	412	117,500	73,500	191,000
June	353,000	2,940,000	283,000	116,000	12,000	0	410	124,200	50,800	175,000
July	316,000	2,882,000	298,000	131,000	14,000	0	407	125,400	55,200	180,600
Aug.	244,000	2,755,000	304,000	78,000	13,000	0	400	126,700	32,500	159,200
Sept.	213,000	2,604,000	282,000	56,000	10,000	0	394	120,000	23,800	143,800
Oct.	236,000	2,469,000	278,000	49,000	7,000	0	388	113,400	19,900	133,300
Nov.	242,000	2,371,000	264,000	66,000	5,000	0	384	110,300	27,500	137,800
Dec.	363,000	2,278,000	273,000	111,000	0	0	380	109,400	44,500	153,900
Total or average	7,127,000		3,208,000	1,588,000	78,000	2,468,000	400	113,000	56,300	169,000
1917										
Jan.	312,000	2,257,000	242,000	0	0	0	382	97,400	0	97,400
Feb.	760,000	2,327,000	226,000	0	0	0	388	101,900	0	101,900
Mar.	459,000	2,861,000	243,000	126,000	0	11,000	412	104,200	53,500	157,700
April	906,000	2,940,000	248,000	231,000	7,000	420,000	410	109,000	101,000	210,000
May	580,000	2,940,000	276,000	210,000	10,000	84,000	411	117,500	89,000	206,500
June	329,000	2,940,000	283,000	92,000	12,000	0	410	124,200	40,300	164,500
July	238,000	2,882,000	297,000	54,000	14,000	0	402	125,400	22,700	148,100
Aug.	214,000	2,755,000	303,000	49,000	13,000	0	402	126,700	20,400	147,100
Sept.	185,000	2,604,000	282,000	28,000	10,000	0	394	120,000	11,900	131,900
Oct.	200,000	2,469,000	278,000	13,000	7,000	0	388	113,400	5,400	118,800
Nov.	224,000	2,371,000	264,000	48,000	5,000	0	384	110,300	20,000	130,300
Dec.	298,000	2,278,000	273,000	46,000	0	0	380	109,400	18,400	127,800
Total or average	4,705,000		3,215,000	897,000	78,000	515,000	397	113,400	32,000	145,400
1918										
Jan.	249,000	2,257,000	243,000	0	0	0	380	97,400	0	97,400
Feb.	399,000	2,263,000	229,000	0	0	0	383	101,900	0	101,900
Mar.	772,000	2,433,000	251,000	8,000	0	6,000	398	104,200	3,400	107,600
April	556,000	2,940,000	247,000	208,000	7,000	94,000	411	109,000	91,100	200,100
May	314,000	2,940,000	276,000	28,000	10,000	0	412	117,500	12,000	129,500
June	232,000	2,940,000	282,000	0	12,000	0	412	124,200	0	124,200
July	200,000	2,878,000	297,000	12,000	14,000	0	408	125,400	5,100	130,500
Aug.	192,000	2,755,000	303,000	27,000	13,000	0	402	126,700	11,200	137,900
Sept.	186,000	2,604,000	282,000	29,000	10,000	0	394	120,000	12,400	132,400
Oct.	258,000	2,469,000	278,000	71,000	7,000	0	388	113,400	28,900	142,300
Nov.	246,000	2,371,000	264,000	70,000	5,000	0	384	110,300	29,000	139,300
Dec.	258,000	2,278,000	270,000	9,000	0	0	380	109,400	3,600	113,000
Total or average	3,862,000		3,222,000	462,000	78,000	100,000	396	113,400	16,300	129,700
1919										
Jan.	587,000	2 257,000	240,000	0	0	0	387	97,400	0	97,400
Feb.	1,163,000	2,604,000	219,000	150,000	0	458,000	404	101,900	69,300	171,200
Mar.	959,000	2,940,000	246,000	251,000	0	462,000	408	104,200	105,800	210,000
April	752,000	2,940,000	249,000	231,000	7,000	265,000	408	109,000	101,000	210,000
May	438,000	2,940,000	277,000	151,000	10,000	0	410	117,500	64,100	181,600
June	252,000	2,940,000	282,000	16,000	12,000	0	412	124,200	7,100	131,300
July	219,000	2,882,000	297,000	35,000	14,000	0	408	125,400	14,800	140,200
Aug.	199,000	2,755,000	303,000	34,000	13,000	0	402	126,700	14,200	140,900
Sept.	168,000	2,604,000	282,000	11,000	10,000	0	394	120,000	4,600	124,600
Oct.	203,000	2,469,000	278,000	16,000	7,000	0	388	113,400	6,500	119,900
Nov.	186,000	2,371,000	264,000	10,000	5,000	0	384	110,300	4,200	114,500
Dec.	180,000	2,278,000	274,000	0	0	0	378	109,400	0	109,400
Total or average	5,306,000		3,211,000	905,000	78,000	1,185,000	399	113,400	32,400	145,800

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1916
2,472,000	240,000	225,000	0	681,000	0	388	97,400	90,700	188,100	Jan.
2,492,000	237,000	252,000	0	1,077,000	0	384	98,400	107,900	206,300	Feb.
2,542,000	252,000	236,000	0	391,000	0	396	104,200	97,000	201,200	Mar.
2,878,000	249,000	211,000	7,000	0	149,000	410	109,000	92,400	201,400	April
2,940,000	276,000	173,000	10,000	0	26,000	412	117,500	73,500	191,000	May
2,940,000	283,000	116,000	12,000	0	0	410	124,200	50,800	175,000	June
2,882,000	298,000	131,000	14,000	0	0	407	125,400	55,200	180,600	July
2,755,000	304,000	78,000	13,000	0	0	400	126,700	32,500	159,200	Aug.
2,604,000	282,000	56,000	10,000	0	0	394	120,000	23,800	143,800	Sept.
2,469,000	278,000	49,000	7,000	0	0	388	113,400	19,900	133,300	Oct.
2,371,000	264,000	66,000	5,000	0	0	384	110,300	27,500	137,800	Nov.
2,278,000	273,000	111,000	0	0	0	380	109,400	44,500	153,900	Dec.
	3,236,000	1,704,000	78,000	2,149,000	175,000	396	113,000	59,500	172,500	Total or average
										1917
2,257,000	242,000	0	0	0	0	382	97,400	0	97,400	Jan.
2,327,000	226,000	26,000	0	178,000	0	387	101,900	11,600	113,500	Feb.
2,657,000	247,000	8,000	0	0	0	406	104,200	3,500	107,700	Mar.
2,861,000	249,000	196,000	7,000	0	375,000	408	109,000	85,600	194,600	April
2,940,000	276,000	210,000	10,000	0	84,000	411	117,500	89,000	206,500	May
2,940,000	283,000	92,000	12,000	0	0	410	124,200	40,300	164,500	June
2,882,000	297,000	54,000	14,000	0	0	408	125,400	22,700	148,100	July
2,755,000	303,000	49,000	13,000	0	0	402	126,700	20,400	147,100	Aug.
2,604,000	282,000	28,000	10,000	0	0	394	120,000	11,900	131,900	Sept.
2,469,000	278,000	13,000	7,000	0	0	388	113,400	5,400	118,800	Oct.
2,371,000	264,000	48,000	5,000	0	0	384	110,300	20,000	130,300	Nov.
2,278,000	273,000	46,000	0	0	0	380	109,400	18,400	127,800	Dec.
	3,220,000	770,000	78,000	178,000	459,000	397	113,400	27,400	140,800	Total or average
										1918
2,257,000	243,000	0	0	0	0	380	97,400	0	97,400	Jan.
2,263,000	229,000	0	0	0	0	383	101,900	0	101,900	Feb.
2,433,000	251,000	8,000	0	0	6,000	398	104,200	3,400	107,600	Mar.
2,940,000	247,000	208,000	7,000	0	94,000	411	109,000	91,100	200,100	April
2,940,000	276,000	28,000	10,000	0	0	412	117,500	12,000	129,500	May
2,940,000	288,000	0	12,000	0	0	412	124,200	0	124,200	June
2,878,000	297,000	12,000	14,000	0	0	408	125,400	5,100	130,500	July
2,755,000	303,000	27,000	13,000	0	0	402	126,700	11,200	137,900	Aug.
2,604,000	282,000	29,000	10,000	0	0	394	120,000	12,400	132,400	Sept.
2,469,000	278,000	71,000	7,000	0	0	388	113,400	28,900	142,300	Oct.
2,371,000	264,000	70,000	5,000	0	0	384	110,300	29,000	139,300	Nov.
2,278,000	270,000	9,000	0	0	0	380	109,400	3,600	113,000	Dec.
	3,222,000	462,000	78,000	0	100,000	396	113,400	16,300	129,700	Total or average
										1919
2,257,000	240,000	71,000	0	34,000	0	385	97,400	29,000	126,400	Jan.
2,499,000	226,000	222,000	0	671,000	0	387	101,900	99,600	201,500	Feb.
2,543,000	251,000	230,000	0	196,000	0	397	104,200	95,200	199,400	Mar.
2,825,000	249,000	224,000	7,000	18,000	139,000	409	109,000	97,600	206,600	April
2,940,000	277,000	151,000	10,000	0	0	410	117,500	64,100	181,600	May
2,940,000	282,000	16,000	12,000	0	0	412	124,200	7,100	131,300	June
2,882,000	297,000	35,000	14,000	0	0	408	125,400	14,800	140,200	July
2,755,000	303,000	34,000	13,000	0	0	402	126,700	14,200	140,900	Aug.
2,604,000	282,000	11,000	10,000	0	0	394	120,000	4,600	124,600	Sept.
2,469,000	278,000	16,000	7,000	0	0	388	113,400	6,500	119,900	Oct.
2,371,000	264,000	10,000	5,000	0	0	384	110,300	4,200	114,500	Nov.
2,278,000	274,000	0	0	0	0	378	109,400	0	109,400	Dec.
	3,223,000	1,020,000	78,000	919,000	139,000	396	113,400	36,000	149,400	Total or average

TABLE 1a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1920										
Jan.	207,000	2,184,000	245,000	0	0	0	375	97,400	0	97,400
Feb.	176,000	2,146,000	233,000	0	0	0	372	98,400	0	98,400
Mar.	372,000	2,089,000	263,000	0	0	0	374	104,200	0	104,200
April	493,000	2,198,000	262,000	0	6,000	0	383	109,000	0	109,000
May	286,000	2,423,000	288,000	0	9,000	0	388	117,500	0	117,500
June	216,000	2,412,000	296,000	0	10,000	0	386	124,200	0	124,200
July	192,000	2,322,000	312,000	0	12,000	0	380	125,400	0	125,400
Aug.	176,000	2,190,000	321,000	0	11,000	0	372	126,700	0	126,700
Sept.	140,000	2,034,000	301,000	0	8,000	0	363	120,000	0	120,000
Oct.	180,000	1,865,000	301,000	0	6,000	0	354	113,400	0	113,400
Nov.	896,000	1,738,000	286,000	25,000	4,000	0	359	110,300	10,400	120,700
Dec.	1,121,000	2,319,000	265,000	244,000	0	0	397	109,400	100,600	210,000
Total or average	4,455,000		3,373,000	269,000	66,000	0	376	113,000	9,400	122,400
1921										
Jan.	1,492,000	2,931,000	232,000	279,000	0	981,000	404	97,400	112,600	210,000
Feb.	1,035,000	2,940,000	219,000	232,000	0	584,000	406	101,900	108,100	210,000
Mar.	982,000	2,940,000	246,000	252,000	0	484,000	408	104,200	105,800	210,000
April	559,000	2,940,000	247,000	227,000	7,000	78,000	410	109,000	99,000	208,000
May	493,000	2,940,000	276,000	195,000	10,000	12,000	411	117,500	83,200	200,700
June	316,000	2,940,000	283,000	79,000	12,000	0	410	124,200	34,600	158,800
July	220,000	2,882,000	297,000	36,000	14,000	0	408	125,400	15,200	140,600
Aug.	192,000	2,755,000	303,000	27,000	13,000	0	402	126,700	11,200	137,900
Sept.	175,000	2,604,000	282,000	18,000	10,000	0	394	120,000	7,800	127,800
Oct.	196,000	2,469,000	277,000	0	7,000	0	389	113,400	0	113,400
Nov.	205,000	2,381,000	264,000	39,000	5,000	0	384	110,300	16,300	126,600
Dec.	390,000	2,278,000	273,000	72,000	0	0	381	109,400	28,900	138,300
Total or average	6,255,000		3,199,000	1,447,000	78,000	2,139,000	400	113,400	51,600	165,000
1922										
Jan.	300,000	2,323,000	240,000	0	0	0	387	97,400	0	97,400
Feb.	679,000	2,383,000	224,000	0	0	0	394	101,900	0	101,900
Mar.	567,000	2,838,000	244,000	142,000	0	79,000	411	104,200	60,100	164,300
April	604,000	2,940,000	248,000	214,000	7,000	135,000	410	109,000	93,600	202,600
May	577,000	2,940,000	276,000	209,000	10,000	82,000	411	117,500	88,300	205,800
June	317,000	2,940,000	283,000	80,000	12,000	0	410	124,200	35,000	159,200
July	203,000	2,882,000	297,000	19,000	14,000	0	408	125,400	7,900	133,300
Aug.	182,000	2,755,000	303,000	17,000	13,000	0	402	126,700	7,100	133,800
Sept.	161,000	2,604,000	282,000	4,000	10,000	0	394	120,000	1,700	121,700
Oct.	208,000	2,469,000	278,000	21,000	7,000	0	388	113,400	8,600	122,000
Nov.	244,000	2,371,000	264,000	68,000	5,000	0	384	110,300	28,300	138,600
Dec.	462,000	2,278,000	273,000	139,000	0	0	380	109,400	55,100	164,500
Total or average	4,504,000		3,212,000	913,000	78,000	296,000	398	113,400	32,300	145,700
1923										
Jan.	467,000	2,328,000	240,000	130,000	0	0	385	97,400	52,400	149,800
Feb.	297,000	2,425,000	225,000	0	0	0	390	101,900	0	101,900
Mar.	287,000	2,497,000	253,000	0	0	0	393	104,200	0	104,200
April	632,000	2,581,000	250,000	0	7,000	0	405	109,000	0	109,000
May	322,000	2,906,000	275,000	3,000	10,000	0	412	117,500	1,300	118,800
June	236,000	2,940,000	282,000	0	12,000	0	412	124,200	0	124,200
July	184,000	2,882,000	297,000	0	14,000	0	408	125,400	0	125,400
Aug.	165,000	2,755,000	303,000	0	13,000	0	402	126,700	0	126,700
Sept.	157,000	2,604,000	282,000	0	10,000	0	394	120,000	0	120,000
Oct.	187,000	2,469,000	278,000	0	7,000	0	388	113,400	0	113,400
Nov.	176,000	2,371,000	264,000	0	5,000	0	384	110,300	0	110,300
Dec.	184,000	2,278,000	274,000	0	0	0	379	109,400	0	109,400
Total or average	3,294,000		3,223,000	133,000	78,000	0	398	113,400	4,600	118,000

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1920
2,184,000	245,000	0	0	0	0	375	97,400	0	97,400	Jan.
2,146,000	233,000	0	0	0	0	372	98,400	0	98,400	Feb.
2,089,000	263,000	0	0	0	0	374	104,200	0	104,200	Mar.
2,198,000	262,000	0	6,000	0	0	383	109,000	0	109,000	April
2,423,000	288,000	0	9,000	0	0	388	117,500	0	117,500	May
2,412,000	296,000	0	10,000	0	0	386	124,200	0	124,200	June
2,322,000	312,000	0	12,000	0	0	380	125,400	0	125,400	July
2,190,000	321,000	0	11,000	0	0	372	126,700	0	126,700	Aug.
2,034,000	301,000	0	8,000	0	0	363	120,000	0	120,000	Sept.
1,865,000	301,000	0	6,000	0	0	354	113,400	0	113,400	Oct.
1,738,000	286,000	25,000	4,000	0	0	359	110,300	10,400	120,700	Nov.
2,319,000	266,000	245,000	0	202,000	0	395	109,400	100,600	210,000	Dec.
	3,374,000	270,000	66,000	202,000	0	375	113,000	9,400	122,400	Total or average
										1921
2,727,000	239,000	277,000	0	1,050,000	0	390	97,400	112,600	210,000	Jan.
2,653,000	226,000	240,000	0	660,000	0	390	101,900	108,100	210,000	Feb.
2,562,000	252,000	244,000	0	226,000	0	396	104,200	100,900	205,100	Mar.
2,822,000	246,000	164,000	7,000	0	24,000	411	109,000	71,900	180,900	April
2,940,000	276,000	195,000	10,000	0	12,000	411	117,500	83,200	200,700	May
2,940,000	283,000	79,000	12,000	0	0	410	124,200	34,600	158,800	June
2,882,000	297,000	36,000	14,000	0	0	408	125,400	15,200	140,600	July
2,755,000	303,000	27,000	13,000	0	0	402	126,700	11,200	137,900	Aug.
2,604,000	282,000	18,000	10,000	0	0	394	120,000	7,800	127,800	Sept.
2,469,000	277,000	0	7,000	0	0	389	113,400	0	113,400	Oct.
2,381,000	264,000	39,000	5,000	0	0	384	110,300	16,300	126,600	Nov.
2,278,000	273,000	72,000	0	0	0	381	109,400	28,900	138,300	Dec.
	3,218,000	1,391,000	78,000	1,936,000	36,000	397	113,400	48,900	162,300	Total or average
										1922
2,323,000	240,000	0	0	0	0	387	97,400	0	97,400	Jan.
2,383,000	225,000	44,000	0	136,000	0	392	101,900	19,900	121,800	Feb.
2,657,000	246,000	17,000	0	0	21,000	407	104,200	7,300	111,500	Mar.
2,940,000	248,000	214,000	7,000	0	135,000	410	109,000	93,600	202,600	April
2,940,000	276,000	209,000	10,000	0	82,000	411	117,500	88,300	205,800	May
2,940,000	283,000	80,000	12,000	0	0	410	124,200	35,000	159,200	June
2,882,000	297,000	19,000	14,000	0	0	408	125,400	7,900	133,300	July
2,755,000	303,000	17,000	13,000	0	0	402	126,700	7,100	133,800	Aug.
2,604,000	282,000	4,000	10,000	0	0	394	120,000	1,700	121,700	Sept.
2,469,000	278,000	21,000	7,000	0	0	388	113,400	8,600	122,000	Oct.
2,371,000	264,000	68,000	5,000	0	0	384	110,300	28,300	138,600	Nov.
2,278,000	273,000	139,000	0	0	0	380	109,400	55,100	164,500	Dec.
	3,215,000	832,000	78,000	136,000	238,000	398	113,400	29,400	142,800	Total or average
										1923
2,328,000	240,000	130,000	0	0	0	385	97,400	52,400	149,800	Jan.
2,425,000	225,000	0	0	0	0	390	101,900	0	101,900	Feb.
2,497,000	253,000	0	0	0	0	393	104,200	0	104,200	Mar.
2,531,000	250,000	0	7,000	0	0	405	109,000	0	109,000	April
2,906,000	275,000	3,000	10,000	0	0	412	117,500	1,300	118,800	May
2,940,000	282,000	0	12,000	0	0	412	124,200	0	124,200	June
2,882,000	297,000	0	14,000	0	0	408	125,400	0	125,400	July
2,755,000	303,000	0	13,000	0	0	402	126,700	0	126,700	Aug.
2,604,000	282,000	0	10,000	0	0	394	120,000	0	120,000	Sept.
2,469,000	278,000	0	7,000	0	0	388	113,400	0	113,400	Oct.
2,371,000	264,000	0	5,000	0	0	384	110,300	0	110,300	Nov.
2,278,000	274,000	0	0	0	0	379	109,400	0	109,400	Dec.
	3,223,000	133,000	78,000	0	0	398	113,400	4,600	118,000	Total or average

TABLE 1a (Concluded). KENNETT
WATER AND POWER YIELD, OPERATING PRIMARILY FOR
BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary				*Primary	Secondary	Total
1924										
Jan.	203,000	2,188,000	245,000	0	0	0	376	97,400	0	97,400
Feb.	332,000	2,146,000	231,000	0	0	0	378	98,400	0	98,400
Mar.	200,000	2,247,000	260,000	0	0	0	379	104,200	0	104,200
April	176,000	2,187,000	266,000	0	6,000	0	374	109,000	0	109,000
May	155,000	2,091,000	301,000	0	8,000	0	367	117,500	0	117,500
June	141,000	1,937,000	315,000	0	9,000	0	358	124,200	0	124,200
July	140,000	1,754,000	341,000	0	10,000	0	345	125,400	0	125,400
Aug.	140,000	1,543,000	360,000	0	8,000	0	330	126,700	0	126,700
Sept.	128,000	1,315,000	349,000	0	6,000	0	312	120,000	0	120,000
Oct.	178,000	1,088,000	363,000	0	4,000	0	293	113,400	0	113,400
Nov.	317,000	899,000	356,000	0	2,000	0	282	110,300	0	110,300
Dec.	321,000	858,000	372,000	0	0	0	277	109,400	0	109,400
Total or average	2,431,000		3,759,000	0	53,000	0	339	113,000	0	113,000
1925										
Jan.	301,000	807,000	336,000	0	0	0	273	97,400	0	97,400
Feb.	1,769,000	772,000	264,000	0	0	0	326	101,900	0	101,900
Mar.	563,000	2,277,000	255,000	0	0	0	389	104,200	0	104,200
April	926,000	2,585,000	250,000	124,000	7,000	190,000	403	109,000	53,800	162,800
May	474,000	2,940,000	276,000	167,000	10,000	21,000	412	117,500	70,800	188,300
June	276,000	2,940,000	282,000	40,000	12,000	0	411	124,200	17,500	141,700
July	173,000	2,882,000	297,000	0	14,000	0	408	125,400	0	125,400
Aug.	167,000	2,744,000	304,000	0	13,000	0	400	126,700	0	126,700
Sept.	163,000	2,594,000	282,000	0	10,000	0	394	120,000	0	120,000
Oct.	181,000	2,465,000	278,000	0	7,000	0	388	113,400	0	113,400
Nov.	192,000	2,361,000	264,000	6,000	5,000	0	384	110,300	2,500	112,800
Dec.	235,000	2,278,000	273,000	0	0	0	380	109,400	0	109,400
Total or average	5,420,000		3,361,000	337,000	78,000	211,000	381	113,400	12,100	125,500
Total for 30-year period, 1896-1926	**188,012,000**		**97,101,000**	**37,953,000**	**2,300,000**	**50,674,000**				
Average for 30-year period, 1896-1926	**6,267,000**		**3,236,000**	**1,265,000**	**77,000**	**1,689,000**	**395.8**	**113,400**	**44,800**	**158,200**

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

POWER GENERATION WITH INCIDENTAL IRRIGATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 1, page 108.)

Installed capacity of power plant 400,000 k.v.a. P. F. = 0.80

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1924
2,188,000	245,000	0	0	0	0	376	97,400	0	97,400	Jan.
2,146,000	231,000	0	0	0	0	378	98,400	0	98,400	Feb.
2,247,000	260,000	0	0	0	0	379	104,200	0	104,200	Mar.
2,187,000	266,000	0	6,000	0	0	374	109,000	0	109,000	April
2,091,000	301,000	0	8,000	0	0	367	117,500	0	117,500	May
1,937,000	315,000	0	9,000	0	0	358	124,200	0	124,200	June
1,754,000	341,000	0	10,000	0	0	345	125,400	0	125,400	July
1,543,000	360,000	0	8,000	0	0	330	126,700	0	126,700	Aug.
1,315,000	349,000	0	6,000	0	0	312	120,000	0	120,000	Sept.
1,088,000	363,000	0	4,000	0	0	293	113,400	0	113,400	Oct.
899,000	356,000	0	2,000	0	0	282	110,300	0	110,300	Nov.
858,000	372,000	0	0	0	0	277	109,400	0	109,400	Dec.
	3,759,000	0	53,000	0	0	339	113,000	0	113,000	Total or average
										1925
807,000	336,000	0	0	0	0	273	97,400	0	97,400	Jan.
772,000	264,000	0	0	0	0	326	101,900	0	101,900	Feb.
2,277,000	255,000	0	0	0	0	389	104,200	0	104,200	Mar.
2,585,000	250,000	124,000	7,000	0	190,000	403	109,000	53,800	162,800	April
2,940,000	276,000	167,000	10,000	0	21,000	412	117,500	70,800	188,300	May
2,940,000	282,000	40,000	12,000	0	0	411	124,200	17,500	141,700	June
2,882,000	297,000	0	14,000	0	0	408	125,400	0	125,400	July
2,744,000	304,000	0	13,000	0	0	400	126,700	0	126,700	Aug.
2,594,000	282,000	0	10,000	0	0	394	120,000	0	120,000	Sept.
2,465,000	278,000	0	7,000	0	0	388	113,400	0	113,400	Oct.
2,361,000	264,000	6,000	5,000	0	0	384	110,300	2,500	112,800	Nov.
2,278,000	273,000	0	0	0	0	380	109,400	0	109,400	Dec.
	3,361,000	337,000	78,000	0	211,000	381	113,400	12,100	125,500	Total or average
	97,481,000	**37,094,000**	**2,300,000**	**40,414,000**	**10,739,000**					**Total for 30-year period, 1896-1926**
	3,249,000	**1,236,000**	**77,000**	**1,347,000**	**358,000**	**393.8**	**113,400**	**43,400**	**156,800**	**Average for 30-year period, 1896-1926**

TABLE 2a. KENNETT RESER

WATER AND POWER YIELD, OPERATING PRIMARILY FOR
BOTH
WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1896									
Jan.	1,980,000	1,860,000	0	0	216,000	684,000	0	400	89,900
Feb.	474,000	2,940,000	0	0	439,000	35,000	0	411	199,400
Mar.	758,000	2,940,000	43,000	0	552,000	206,000	0	410	225,300
April	891,000	2,940,000	214,000	7,000	631,000	253,000	0	408	275,800
May	1,194,000	2,940,000	684,000	10,000	663,000	500,000	0	406	280,000
June	536,000	2,940,000	855,000	12,000	648,000	0	0	339	280,000
July	313,000	2,609,000	941,000	13,000	704,000	0	0	376	280,000
Aug.	268,000	1,968,000	855,000	10,000	769,000	0	0	340	280,000
Sept.	258,000	1,371,000	513,000	6,000	513,000	0	0	312	176,100
Oct.	262,000	1,110,000	171,000	4,000	171,000	0	0	309	56,200
Nov.	472,000	1,197,000	0	3,000	0	0	0	...	0
Dec.	920,000	1,666,000	0	0	0	0	0	...	0
Total or average	8,306,000		4,276,000	65,000	5,286,000	1,678,000	0	375	178,400
1897									
Jan.	577,000	2,586,000	0	0	141,000	82,000	0	411	59,800
Feb.	1,338,000	2,940,000	0	0	599,000	739,000	0	406	280,000
Mar.	737,000	2,940,000	43,000	0	691,000	136,000	0	409	254,600
April	858,000	2,940,000	214,000	7,000	639,000	212,000	0	408	280,000
May	554,000	2,940,000	684,000	10,000	660,000	3,000	0	408	280,000
June	310,000	2,797,000	855,000	11,000	663,000	0	0	389	280,000
July	275,000	2,241,000	941,000	12,000	741,000	0	0	354	280,000
Aug.	254,000	1,563,000	855,000	9,000	803,000	0	0	309	264,400
Sept.	247,000	953,000	513,000	5,000	513,000	0	0	272	152,400
Oct.	262,000	682,000	171,000	3,000	171,000	0	0	266	48,090
Nov.	274,000	770,000	0	2,000	0	0	0	...	0
Dec.	366,000	1,042,000	0	0	0	0	0	...	0
Total or average	6 052,000		4,276,000	59,000	5,531,000	1,172,000	0	359	180,800
1898									
Jan.	257,000	1,408,000	0	0	0	0	0	...	0
Feb.	478,000	1,665,000	0	0	0	0	0	...	0
Mar.	380,000	2,143,000	43,000	0	43,000	0	0	385	17,300
April	274,000	2,480,000	214,000	7,000	214,000	0	0	395	91,000
May	300,000	2,533,000	684,000	9,000	684,000	0	0	383	275,000
June	304,000	2,140,000	855,000	10,000	717,000	0	0	353	280,000
July	237,000	1,579,000	941,000	9,000	809,000	0	0	306	260,200
Aug.	225,000	866,000	855,000	6,000	691,000	0	0	229	162,000
Sept.	198,000	230,000	426,000	2,000	0	0	87,000	...	0
Oct.	221,000	0	171,000	0	0	0	0	...	0
Nov.	217,000	50,000	0	0	0	0	0	...	0
Dec.	217,000	267,000	0	0	0	0	0	...	0
Total or average	3,308,000		4,189,000	43,000	3,149,000	0	87,000	342	91,200
1899									
Jan.	605,000	484,000	0	0	0	0	0	...	0
Feb.	253,000	1,089,000	0	0	0	0	0	...	0
Mar.	900,000	1,342,000	43,000	0	42,000	0	0	347	15,900
April	456,000	2,199,000	214,000	6,000	214,000	0	0	384	80,300
May	330,000	2,435,000	684,000	9,000	684,000	0	0	379	272,400
June	302,000	2,072,000	855,000	9,000	726,000	0	0	348	280,000
July	240,000	1,510,000	941,000	9,000	790,000	0	0	300	252,000
Aug.	224,000	800,000	855,000	5,000	673,000	0	0	217	146,100
Sept.	197,000	164,000	360,000	1,000	0	0	153,000	...	0
Oct.	252,000	0	171,000	0	0	0	0	...	0
Nov.	645,000	81,000	0	0	0	0	0	...	0
Dec.	646,000	726,000	0	0	0	0	0	...	0
Total or average	5,050,000		4,123,000	39,000	3,130,000	0	153,000	329	88,700

VOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 451,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1896
1,860,000	0	0	246,000	1,085,000	0	0	382	99,100	Jan.
2,509,000	0	0	235,000	29,000	0	0	398	104,000	Feb.
2,719,000	43,000	0	321,000	34,000	162,000	0	407	134,900	Mar.
2,940,000	214,000	7,000	631,000	0	253,000	0	408	275,800	April
2,940,000	684,000	10,000	663,000	0	500,000	0	406	289,000	May
2,940,000	855,000	12,000	648,000	0	0	0	399	280,000	June
2,609,000	941,000	13,000	704,000	0	0	0	376	280,000	July
1,968,000	855,000	10,000	769,000	0	0	0	340	280,000	Aug.
1,371,000	513,000	6,000	513,000	0	0	0	312	176,100	Sept.
1,110,000	171,000	4,000	171,000	0	0	0	309	56,200	Oct.
1,197,000	0	3,000	0	0	0	0	...	0	Nov.
1,666,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	65,000	4,901,000	1,148,000	915,000	0	373	164,000	Total or average
									1897
2,586,000	0	0	477,000	178,000	0	0	332	195,700	Jan.
2,508,000	0	0	618,000	698,000	0	0	385	276,000	Feb.
2,530,000	43,000	0	416,000	40,000	0	0	338	171,600	Mar.
2,811,000	214,000	7,000	554,000	0	168,000	0	408	242,100	April
2,940,000	684,000	10,000	660,000	0	3,000	0	408	280,000	May
2,797,000	855,000	11,000	663,000	0	0	0	389	280,000	June
2,241,000	941,000	12,000	741,000	0	0	0	354	280,000	July
1,563,000	855,000	9,000	803,000	0	0	0	309	264,400	Aug.
953,000	513,000	5,000	513,000	0	0	0	272	152,400	Sept.
682,000	171,000	3,000	171,000	0	0	0	266	48,000	Oct.
770,000	0	2,000	0	0	0	0	...	0	Nov.
1,042,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	5,616,000	916,000	171,000	0	358	181,900	Total or average
									1898
1,408,000	0	0	0	0	0	0	...	0	Jan.
1,665,000	0	0	0	0	0	0	...	0	Feb.
2,143,000	43,000	0	43,000	0	0	0	285	17,300	Mar.
2,480,000	214,000	7,000	214,000	0	0	0	395	91,000	April
2,533,000	684,000	9,000	684,000	0	0	0	383	275,000	May
2,140,000	855,000	10,000	717,000	0	0	0	353	280,000	June
1,579,000	941,000	9,000	809,000	0	0	0	306	260,200	July
866,000	855,000	6,000	691,000	0	0	0	229	162,000	Aug.
230,000	426,000	2,000	0	0	0	87,000	...	0	Sept.
0	171,000	0	0	0	0	0	...	0	Oct.
50,000	0	0	0	0	0	0	...	0	Nov.
267,000	0	0	0	0	0	0	...	0	Dec.
	4,189,000	43,000	3,149,000	0	0	87,000	342	91,200	Total or average
									1899
484,000	0	0	0	0	0	0	...	0	Jan.
1,089,000	0	0	0	0	0	0	...	0	Feb.
1,342,000	43,000	0	43,000	0	0	0	347	15,900	Mar.
2,199,000	214,000	6,000	214,000	0	0	0	384	89,300	April
2,435,000	684,000	9,000	684,000	0	0	0	379	272,400	May
2,072,000	855,000	9,000	726,000	0	0	0	348	280,000	June
1,510,000	941,000	9,000	790,000	0	0	0	300	252,000	July
800,000	855,000	5,000	673,000	0	0	0	217	146,100	Aug.
164,000	360,000	1,000	0	0	0	153,000	...	0	Sept.
0	171,000	0	0	0	0	0	...	0	Oct.
81,000	0	0	0	0	0	0	...	0	Nov.
726,000	0	0	0	0	0	0	...	0	Dec.
	4,123,000	39,000	3,130,000	0	0	153,000	329	88,700	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet.

Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1900									
Jan.	1,239,000	1,372,000	0	0	0	0	0	...	0
Feb.	331,000	2,671,000	0	0	122,000	0	0	411	57,300
Mar.	912,000	2,940,000	43,000	0	585,000	327,000	0	409	247,400
April	457,000	2,940,000	214,000	7,000	450,000	0	0	412	197,800
May	413,000	2,940,000	684,000	10,000	666,000	0	0	404	280,000
June	247,000	2,659,000	855,000	11,000	675,000	0	0	280	280,000
July	219,000	2,040,000	941,000	11,000	769,000	0	0	339	280,000
Aug.	208,000	1,307,000	855,000	8,000	772,000	0	0	284	232,500
Sept.	201,000	652,000	513,000	4,000	513,000	0	0	230	124,400
Oct.	308,000	336,000	171,000	2,000	171,000	0	0	222	38,200
Nov.	368,000	471,000	0	2,000	0	0	0	...	0
Dec.	697,000	837,000	0	0	0	0	0	...	0
Total or average	5,720,000		4,276,000	55,000	4,723,000	327,000	0	337	145,500
1901									
Jan.	895,000	1,534,000	0	0	0	0	0	...	0
Feb.	1,304,000	2,429,000	0	0	195,000	398,000	0	460	89,700
Mar.	749,000	2,940,000	43,000	0	588,000	161,000	0	409	248,800
April	382,000	2,940,000	214,000	7,000	375,000	0	0	412	165,000
May	411,000	2,940,000	684,000	10,000	663,000	0	0	404	280,000
June	240,000	2,657,000	855,000	11,000	675,000	0	0	280	280,000
July	218,000	2,031,000	941,000	11,000	772,000	0	0	339	280,000
Aug.	206,000	1,297,000	855,000	8,000	769,000	0	0	283	230,900
Sept.	200,000	640,000	513,000	4,000	513,000	0	0	228	123,100
Oct.	215,000	323,000	171,000	2,000	171,000	0	0	211	35,900
Nov.	354,000	365,000	0	1,000	0	0	0	...	0
Dec.	550,000	718,000	0	0	0	0	0	...	0
Total or average	5,724,000		4,276,000	54,000	4,721,000	759,000	0	336	144,900
1902									
Jan.	227,000	1,268,000	0	0	0	0	0	...	0
Feb.	2,782,000	1,495,000	0	0	240,000	1,037,000	0	398	110,100
Mar.	1,115,000	2,940,000	43,000	0	648,000	467,000	0	407	273,700
April	891,000	2,940,000	214,000	7,000	634,000	250,000	0	408	277,200
May	765,000	2,940,000	684,000	10,000	660,000	105,000	0	409	280,000
June	407,000	2,906,000	855,000	12,000	654,000	0	0	337	280,000
July	254,000	2,446,000	941,000	13,000	713,000	0	0	366	280,600
Aug.	234,000	1,746,000	855,000	9,000	812,000	0	0	323	280,000
Sept.	184,000	1,116,000	513,000	5,000	513,000	0	0	285	160,600
Oct.	235,000	782,000	171,000	3,000	171,000	0	0	276	50,000
Nov.	829,000	843,000	0	2,000	0	0	0	...	0
Dec.	762,000	1,670,000	0	0	0	0	0	...	0
Total or average	8,685,000		4,276,000	61,000	5,051,000	1,919,000	0	361	166,300
1903									
Jan.	1,113,000	2,432,000	0	0	151,000	454,000	0	401	63,000
Feb.	633,000	2,940,000	0	0	565,000	68,000	0	410	265,500
Mar.	1,339,000	2,940,000	43,000	0	660,000	679,000	0	408	280,000
April	765,000	2,940,000	214,000	7,000	609,000	149,000	0	409	266,400
May	458,000	2,940,000	684,000	10,000	663,000	0	0	405	280,000
June	278,000	2,704,000	855,000	11 000	672,000	0	0	384	280,000
July	231,000	2,116,000	941,000	11,000	760,000	0	0	345	280,000
Aug.	204,000	1,395,000	855,000	8,000	781,000	0	0	232	242,700
Sept.	174,000	736,000	513,000	4,000	513,000	0	0	244	131,700
Oct.	199,000	393,000	171,000	2,000	171,000	0	0	222	38,300
Nov.	924,000	419,000	0	1,000	0	0	0	...	0
Dec.	530,000	1,342,000	0	0	0	0	0	...	0
Total or average	6,848,000		4,276,000	54,000	5,545,000	1,350,000	0	347	176,700

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1900
1,372,000	0	0	181,000	0	0	0	390	73,800	Jan.
2,490,000	0	0	276,000	26,000	0	0	394	125,100	Feb.
2,579,000	43,000	0	334,000	279,000	0	0	400	137,400	Mar.
2,878,000	214,000	7,000	388,000	0	0	0	412	170,600	April
2,940,000	684,000	10,000	666,000	0	0	0	404	280,000	May
2,659,000	855,000	11,000	675,000	0	0	0	380	280,000	June
2,040,000	941,000	11,000	769,000	0	0	0	339	280,000	July
1,307,000	855,000	8,000	772,000	0	0	0	284	232,500	Aug.
652,000	513,000	4,000	513,000	0	0	0	230	124,400	Sept.
336,000	171,000	2,000	171,000	0	0	0	222	38,200	Oct.
471,000	0	2,000	0	0	0	0	...	0	Nov.
837,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	55,000	4,745,000	305,000	0	0	342	145,300	Total or average
									1901
1,534,000	0	0	0	0	0	0	...	0	Jan.
2,429,000	0	0	481,000	711,000	0	0	386	214,700	Feb.
2,541,000	43,000	0	387,000	99,000	0	0	398	159,100	Mar.
2,804,000	214,000	7,000	239,000	0	0	0	411	105,000	April
2,940,000	684,000	10,000	663,000	0	0	0	404	280,000	May
2,657,000	855,000	11,000	675,000	0	0	0	380	280,000	June
2,031,000	941,000	11,000	772,000	0	0	0	339	280,000	July
1,297,000	855,000	8,000	769,000	0	0	0	283	230,900	Aug.
640,000	513,000	4,000	513,000	0	0	0	228	123,100	Sept.
323,000	171,000	2,000	171,000	0	0	0	211	35,900	Oct.
365,000	0	1,000	0	0	0	0	...	0	Nov.
718,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	54,000	4,670,000	810,000	0	0	337	142,000	Total or average
									1902
1,268,000	0	0	0	0	0	0	...	0	Jan.
1,495,000	0	0	339,000	1,372,000	0	0	379	149,600	Feb.
2,566,000	43,000	0	523,000	310,000	0	0	397	218,000	Mar.
2,842,000	214,000	7,000	552,000	0	234,000	0	403	241,500	April
2,940,000	684,000	10,000	660,000	0	105,000	0	403	280,000	May
2,906,000	855,000	12,000	654,000	0	0	0	397	280,000	June
2,446,000	941,000	13,000	719,000	0	0	0	366	280,000	July
1,746,000	855,000	9,000	812,000	0	0	0	323	280,000	Aug.
1,116,000	513,000	5,000	513,000	0	0	0	285	160,600	Sept.
782,000	171,000	3,000	171,000	0	0	0	276	50,000	Oct.
843,000	0	2,000	0	0	0	0	...	0	Nov.
1,670,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	61,000	4,949,000	1,682,000	339,000	0	359	161,600	Total or average
									1903
2,432,000	0	0	442,000	614,000	0	0	387	178,800	Jan.
2,489,000	0	0	527,000	47,000	0	0	389	237,600	Feb.
2,548,000	43,000	0	612,000	463,000	0	0	395	252,000	Mar.
2,812,000	214,000	7,000	581,000	25,000	24,000	0	409	253,900	April
2,940,000	684,000	10,000	663,000	0	0	0	405	280,000	May
2,704,000	855,000	11,000	672,000	0	0	0	384	280,000	June
2,116,000	941,000	11,000	760,000	0	0	0	345	280,000	July
1,395,000	855,000	8,000	781,000	0	0	0	292	242,700	Aug.
736,000	513,000	4,000	513,000	0	0	0	241	131,700	Sept.
393,000	171,000	2,000	171,000	0	0	0	222	38,300	Oct.
419,000	0	1,000	0	0	0	0	...	0	Nov.
1,342,000	0	0	0	0	0	0	...	0	Dec
	4,276,000	54,000	5,722,000	1,149,000	24,000	0	345	181,000	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH

WITH AND WITHOUT FLOOD CONTROL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1904									
Jan.	473,000	1,872,000	0	0	0	0	0	...	0
Feb.	1,742,000	2,345,000	0	0	281,000	866,000	0	400	125,100
Mar.	2,877,000	2,940,000	43,000	0	670,000	2,207,000	0	400	280,000
April	1,467,000	2,940,000	214,000	7,000	645,000	815,000	0	402	280,000
May	914,000	2,940,000	684,000	10,000	660,000	220,000	0	407	280,000
June	505,000	2,940,000	855,000	12,000	648,000	0	0	400	280,000
July	377,000	2,578,000	941,000	13,000	704,000	0	0	376	280,000
Aug.	282,000	2,001,000	855,000	10,000	763,000	0	0	342	280,000
Sept.	271,000	1,418,000	513,000	6,000	513,000	0	0	316	178,300
Oct.	491,000	1,170,000	171,000	4,000	171,000	0	0	322	58,600
Nov.	379,000	1,486,000	0	3,000	0	0	0	...	0
Dec.	600,000	1,862,000	0	0	0	0	0	...	0
Total or average	10,378,000		4,276,000	65,000	5,055,000	4,108,000	0	372	170,200
1905									
Jan.	1,371,000	2,462,000	0	0	315,000	578,000	0	404	132,100
Feb.	1,027,000	2,940,000	0	0	596,000	431,000	0	407	278,300
Mar.	1,335,000	2,940,000	43,000	0	649,000	686,000	0	406	273,500
April	753,000	2,940,000	214,000	7,000	619,000	127,000	0	403	270,800
May	560,000	2,940,000	684,000	10,000	660,000	0	0	408	280,000
June	365,000	2,806,000	855,000	11,000	660,000	0	0	391	280,000
July	269,000	2,305,000	941,000	12,000	735,000	0	0	358	280,000
Aug.	236,000	1 621,000	855,000	9,000	809,000	0	0	313	270,200
Sept.	208,000	993,000	513,000	5,000	513,000	0	0	274	153,800
Oct.	221,000	683,000	171,000	3,000	171,000	0	0	264	47,600
Nov.	229,000	730,000	0	2,000	0	0	0	...	0
Dec.	249,000	957,000	0	0	0	0	0	...	0
Total or average	6,823,000		4,276,000	59,000	5,727,000	1,822,000	0	361	188,300
1906									
Jan.	851,000	1,206,000	0	0	0	0	0	...	0
Feb.	872,000	2,057,000	0	0	0	0	0	...	0
Mar.	1,646,000	2,929,000	43,000	0	657,000	978,000	0	409	280,000
April	995,000	2,940,000	214,000	7,000	642,000	346,000	0	406	280,000
May	817,000	2,940,000	684,000	10,000	660,000	123,000	0	407	280,000
June	756,000	2,940,000	855,000	12,000	641,000	44,000	0	406	280,000
July	362,000	2,785,000	941,000	14,000	688,000	0	0	387	280,000
Aug.	280,000	2,192,000	855,000	11,000	741,000	0	0	354	280,000
Sept.	247,000	1,606,000	513,000	7,000	513,000	0	0	329	186,000
Oct.	251,000	1,333,000	171,000	5 000	171,000	0	0	326	59,300
Nov.	256,000	1,408,000	0	3,000	0	0	0	...	0
Dec.	648,000	1,661,000	0	0	0	0	0	...	0
Total or average	7,981,000		4,276,000	69,000	4,713,000	1,491,000	0	378	161,500
1907									
Jan.	936,000	2,309,000	0	0	140,000	165,000	0	407	59,100
Feb.	1,636,000	2,940,000	0	0	602,000	1,034,000	0	403	280,000
Mar.	2,115,000	2,940,000	43,000	0	666,000	1,449,000	0	403	280,000
April	1,250,000	2,940,000	214,000	7,000	642,000	601,000	0	404	280,000
May	646,000	2,940,000	684,000	10,000	658,000	8,000	0	409	280,000
June	421,000	2,884,000	855,000	12,000	651,000	0	0	396	280,000
July	334,000	2,438,000	941,000	13,000	716,000	0	0	368	280,000
Aug.	291,000	1,818,000	855,000	10,000	790,000	0	0	331	280,000
Sept.	252,000	1,244,000	513,000	6,000	513,000	0	0	301	169,700
Oct.	261,000	977,000	171,000	4,000	171,000	0	0	296	53,900
Nov.	256,000	1,063,000	0	3,000	0	0	0	...	0
Dec.	479,000	1,316,000	0	0	0	0	0	...	0
Total or average	8,877,000		4,276,000	65,000	5,552,000	3,257,000	0	369	186,200

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasona irrigation yield (deficiency in supp y one year in en, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1904
1,872,000	0	0	0	0	0	0	...	0	Jan.
2,345,000	0	0	363,000	1,194,000	0	0	381	155,300	Feb.
2,530,000	43,000	0	688,000	1,861,000	0	0	387	280,000	Mar.
2,858,000	214,000	7,000	642,000	115,000	621,000	0	405	280,000	April
2,940,000	684,000	10,000	660,000	0	220,000	0	407	280,000	May
2,940,000	855,000	12,000	648,000	0	0	0	400	280,000	June
2,578,000	941,000	13,000	704,000	0	0	0	376	280,000	July
2,001,000	855,000	10,000	763,000	0	0	0	342	280,000	Aug.
1,418,000	513,000	6,000	513,000	0	0	0	316	178,300	Sept.
1,170,000	171,000	4,000	171,000	0	0	0	322	58,600	Oct.
1,486,000	0	3,000	0	0	0	0	...	0	Nov.
1,862,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	65,000	5,152,000	3,170,000	841,000	0	370	172,600	Total or average
									1905
2,462,000	0	0	545,000	656,000	0	0	390	222,700	Jan.
2,632,000	0	0	591,000	469,000	0	0	393	268,600	Feb.
2,599,000	43,000	0	606,000	407,000	0	0	398	250,900	Mar.
2,921,000	214,000	7,000	618,000	18,000	91,000	0	403	270,800	April
2,940,000	684,000	10,000	660,000	0	0	0	408	280,000	May
2,806,000	855,000	11,000	660,000	0	0	0	391	280,000	June
2,395,000	941,000	12,000	735,000	0	0	0	358	280,000	July
1,621,000	855,000	9,000	802,000	0	0	0	315	270,200	Aug.
993,000	513,000	5,000	513,000	0	0	0	274	153,800	Sept.
683,000	171,000	3,000	171,000	0	0	0	264	47,600	Oct.
720,000	0	2,000	0	0	0	0	...	0	Nov.
957,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	5,908,000	1,550,000	91,000	0	359	193,300	Total or average
									1905
1,206,000	0	0	0	0	0	0	...	0	Jan.
2,057,000	0	0	117,000	206,000	0	0	332	53,300	Feb.
2,606,000	43,000	0	627,000	790,000	0	0	394	257,900	Mar.
2,835,000	214,000	7,000	640,000	104,000	139,000	0	407	280,000	April
2,940,000	684,000	10,000	660,000	0	123,000	0	407	280,000	May
2,940,000	855,000	12,000	641,000	0	44,000	0	406	280,000	June
2,785,000	941,000	14,000	688,000	0	0	0	387	280,000	July
2,192,000	855,000	11,000	741,000	0	0	0	354	280,000	Aug.
1,606,000	513,000	7,000	513,000	0	0	0	329	186,000	Sept.
1,333,000	171,000	5,000	171,000	0	0	0	326	59,300	Oct.
1,408,000	0	3,000	0	0	0	0	...	0	Nov.
1,661,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	69,000	4,798,000	1,100,000	306,000	0	377	163,700	Total or average
									1907
2,509,000	0	0	539,000	218,000	0	0	389	219,600	Jan.
2,488,000	0	0	626,000	968,000	0	0	384	280,000	Feb.
2,530,000	43,000	0	680,000	1,147,000	0	0	392	278,600	Mar.
2,818,000	214,000	7,000	642,000	135,000	344,000	0	404	280,000	April
2,940,000	684,000	10,000	658,000	0	8,000	0	409	280,000	May
2,884,000	855,000	12,000	654,000	0	0	0	396	280,000	June
2,438,000	941,000	13,000	716,000	0	0	0	368	280,000	July
1,818,000	855,000	10,000	790,000	0	0	0	331	280,000	Aug.
1,244,000	513,000	6,000	513,000	0	0	0	301	169,700	Sept.
977,000	171,000	4,000	171,000	0	0	0	296	53,900	Oct.
1,063,000	0	3,000	0	0	0	0	...	0	Nov.
1,316,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	65,000	5,989,000	2,468,000	352,000	0	366	199,700	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1908									
Jan.	904,000	1,795,000	0	0	0	0	0	...	0
Feb.	970,000	2,699,000	0	0	472,000	257,000	0	409	213,100
Mar.	669,000	2,940,000	43,000	0	624,000	45,000	0	410	264,300
April	527,000	2,940,000	214,000	7,000	520,000	0	0	411	227,900
May	492,000	2,940,000	684,000	10,000	663,000	0	0	406	280,000
June	340,000	2,738,000	855,000	11,000	666,000	0	0	387	280,000
July	260,000	2,212,000	941,000	12,000	744,000	0	0	352	280,000
Aug.	229,000	1,519,000	855,000	8,000	797,000	0	0	305	258,500
Sept.	205,000	885,000	513,000	5,000	513,000	0	0	262	146,000
Oct.	235,000	572,000	171,000	3,000	171,000	0	0	251	44,800
Nov.	257,000	633,000	0	2,000	0	0	0	...	0
Dec.	267,000	888,000	0	0	0	0	0	...	0
Total or average	5,355,000		4,276,000	58,000	5,170,000	302,000	0	353	166,000
1909									
Jan.	3,260,000	1,155,000	0	0	282,000	1,193,000	0	397	117,100
Feb.	2,526,000	2,940,000	0	0	605,000	1,921,000	0	400	280,000
Mar.	977,000	2,940,000	43,000	0	666,000	311,000	0	404	280,000
April	756,000	2,940,000	214,000	7,000	636,000	113,000	0	409	280,000
May	581,000	2,940,000	684,000	10,000	659,000	5,000	0	408	280,000
June	410,000	2,822,000	855,000	11,000	657,000	0	0	393	280,000
July	308,000	2,366,000	941,000	12,000	725,000	0	0	363	280,000
Aug.	264,000	1,721,000	855,000	9,000	809,000	0	0	323	280,000
Sept.	246,000	1,121,000	513,000	5,000	513,000	0	0	289	163,100
Oct.	284,000	849,000	171,000	3,000	171,000	0	0	286	51,700
Nov.	538,000	959,000	0	2,000	0	0	0	...	0
Dec.	721,000	1,495,000	0	0	0	0	0	...	0
Total or average	10,871,000		4,276,000	59,000	5,723,000	3,543,000	0	362	190,400
1910									
Jan.	708,000	2,216,000	0	0	0	0	0	...	0
Feb.	847,000	2,924,000	0	0	551,000	280,000	0	409	257,400
Mar.	1,239,000	2,940,000	43,000	0	663,000	576,000	0	405	280,000
April	665,000	2,940,000	214,000	7,000	603,000	55,000	0	411	264,900
May	415,000	2,940,000	684,000	10,000	663,000	0	0	405	280,000
June	282,000	2,661,000	855,000	11,000	675,000	0	0	381	280,000
July	254,000	2,077,000	941,000	11,000	763,000	0	0	344	280,000
Aug.	236,000	1,379,000	855,000	8,000	781,000	0	0	292	242,600
Sept.	214,000	752,000	513,000	4,000	513,000	0	0	246	135,400
Oct.	231,000	449,000	171,000	2,000	171,000	0	0	234	41,000
Nov.	274,000	507,000	0	2,000	0	0	0	...	0
Dec.	436,000	779,000	0	0	0	0	0	...	0
Total or average	5,801,000		4,276,000	55,000	5,383,000	911,000	0	347	171,100
1911									
Jan.	700,000	1,215,000	0	0	0	0	0	...	0
Feb.	848,000	1,915,000	0	0	0	0	0	...	0
Mar.	1,278,000	2,763,000	43,000	0	562,000	539,000	0	407	237,000
April	962,000	2,940,000	214,000	7,000	639,000	316,000	0	408	280,000
May	671,000	2,940,000	684,000	10,000	657,000	13,000	0	410	280,000
June	431,000	2,904,000	855,000	12,000	654,000	0	0	397	280,000
July	287,000	2,468,000	941,000	13,000	716,000	0	0	368	280,000
Aug.	244,000	1,801,000	855,000	10,000	797,000	0	0	328	280,000
Sept.	231,000	1,180,000	513,000	6,000	513,000	0	0	294	165,600
Oct.	246,000	892,000	171,000	3,000	171,000	0	0	288	52,300
Nov.	241,000	964,000	0	2,000	0	0	0	...	0
Dec.	244,000	1,203,000	0	0	0	0	0	...	0
Total or average	6,383,000		4,276,000	63,000	4,709,000	868,000	0	362	155,500

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1908
1,795,000	0	0	44,000	0	0	0	399	18,100	Jan.
2,655,000	0	0	536,000	537,000	0	0	388	232,200	Feb.
2,552,000	43,000	0	311,000	16,000	0	0	401	128,900	Mar.
2,894,000	214,000	7,000	474,000	0	0	0	411	207,800	April
2,940,000	684,000	10,000	663,000	0	0	0	406	280,000	May
2,738,000	855,000	11,000	666,000	0	0	0	387	280,000	June
2,212,000	941,000	12,000	744,000	0	0	0	352	280,000	July
1,519,000	855,000	8,000	797,000	0	0	0	305	258,500	Aug.
885,000	513,000	5,000	513,000	0	0	0	262	146,000	Sept.
572,000	171,000	3,000	171,000	0	0	0	251	44,800	Oct.
633,000	0	2,000	0	0	0	0	...	0	Nov.
888,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	58,000	4,919,000	553,000	0	0	352	155,900	Total or average
									1909
1,155,000	0	0	321,000	1,588,000	0	0	381	128,600	Jan.
2,506,000	0	0	623,000	1,784,000	0	0	386	280,000	Feb.
2,625,000	43,000	0	543,000	150,000	0	0	401	225,800	Mar.
2,903,000	214,000	7,000	627,000	2,000	83,000	0	409	275,300	April
2,940,000	684,000	10,000	659,000	0	5,000	0	408	280,000	May
2,822,000	855,000	11,000	627,000	0	0	0	393	280,000	June
2,366,000	941,000	12,000	725,000	0	0	0	363	280,000	July
1,721,000	855,000	9,000	809,000	0	0	0	323	280,000	Aug.
1,121,000	513,000	5,000	513,000	0	0	0	289	163,100	Sept.
848,000	171,000	3,000	171,000	0	0	0	286	51,700	Oct.
959,000	0	2,000	0	0	0	0	...	0	Nov.
1,405,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	5,648,000	3,524,000	94,000	0	363	186,400	Total or average
									1910
2,216,000	0	0	154,000	126,000	0	0	393	63,200	Jan.
2,644,000	0	0	414,000	303,000	0	0	389	190,300	Feb.
2,774,000	43,000	0	652,000	279,000	162,000	0	406	265,700	Mar.
2,940,000	214,000	7,000	603,000	0	55,000	0	411	264,900	April
2,940,000	684,000	10,000	693,000	0	0	0	405	280,000	May
2,661,000	855,000	11,000	675,000	0	0	0	381	280,000	June
2,077,000	941,000	11,000	763,000	0	0	0	344	280,000	July
1,379,000	855,000	8,000	781,000	0	0	0	292	242,600	Aug.
752,000	513,000	4,000	513,000	0	0	0	246	135,400	Sept.
449,000	171,000	2,000	171,000	0	0	0	234	41,600	Oct.
507,000	0	2,000	0	0	0	0	...	0	Nov.
779,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	55,000	5,369,000	708,000	217,000	0	347	170,100	Total or average
									1911
1,215,000	0	0	0	0	0	0	...	0	Jan.
1,915,000	0	0	167,000	5,000	0	0	334	73,669	Feb.
2,591,000	43,000	0	634,000	417,000	0	0	335	263,200	Mar.
2,813,000	214,000	7,000	638,000	59,000	131,000	0	407	278,300	April
2,940,000	684,000	10,000	657,000	0	13,000	0	410	280,000	May
2,901,000	855,000	12,000	654,000	0	0	0	397	280,000	June
2,468,000	941,000	13,000	716,000	0	0	0	338	280,000	July
1,801,000	855,000	10,000	797,000	0	0	0	328	280,000	Aug.
1,180,000	513,000	6,000	513,000	0	0	0	244	165,600	Sept.
832,000	171,000	3,000	171,000	0	0	0	288	52,300	Oct.
964,000	0	2,000	0	0	0	0	...	0	Nov.
1,203,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	65,000	4,952,000	481,000	144,000	0	363	163,300	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1912									
Jan.	517,000	1,447,000	0	0	0	0	0	...	0
Feb.	396,000	1,964,000	0	0	0	0	0	...	0
Mar.	635,000	2,360,000	43,000	0	55,000	0	0	402	23,000
April	487,000	2,940,000	214,000	7,000	455,000	25,000	0	411	199,900
May	714,000	2,940,000	684,000	10,000	659,000	58,000	0	408	280,000
June	405,000	2,902,000	855,000	12,000	654,000	0	0	396	280,000
July	274,000	2,440,000	941,000	13,000	719,000	0	0	366	280,000
Aug.	238,000	1,760,000	855,000	9,000	806,000	0	0	325	280,000
Sept.	242,000	1,134,000	513,000	5,000	513,000	0	0	290	163,600
Oct.	226,000	858,000	171,000	3,000	171,000	0	0	284	51,500
Nov.	432,000	910,000	0	2,000	0	0	0	...	0
Dec.	369,000	1,340,000	0	0	0	0	0	...	0
Total or average	4,935,000		4,276,000	61,000	4,032,000	83,000	0	360	130,200
1913									
Jan.	763,000	1,709,000	0	0	0	0	0	...	0
Feb.	387,000	2,472,000	0	0	0	0	0	...	0
Mar.	441,000	2,859,000	43,000	0	354,000	6,000	0	412	150,400
April	685,000	2,940,000	214,000	7,000	626,000	52,000	0	410	274,300
May	521,000	2,940,000	684,000	10,000	663,000	0	0	406	280,000
June	321,000	2,767,000	855,000	11,000	666,000	0	0	388	280,000
July	263,000	2,222,000	941,000	12,000	744,000	0	0	352	280,000
Aug.	232,000	1,532,000	855,000	8,000	800,000	0	0	306	260,400
Sept.	190,000	901,000	513,000	5,000	513,000	0	0	263	146,500
Oct.	202,000	573,000	171,000	3,000	171,000	0	0	249	44,500
Nov.	316,000	601,000	0	2,000	0	0	0	...	0
Dec.	696,000	915,000	0	0	0	0	0	...	0
Total or average	5,017,000		4,276,000	58,000	4,537,000	58,000	0	348	143,800
1914									
Jan.	2,797,000	1,611,000	0	0	346,000	1,122,000	0	399	144,100
Feb.	1,359,000	2,940,000	0	0	592,000	767,000	0	406	275,700
Mar.	987,000	2,940,000	43,000	0	660,000	327,000	0	407	280,000
April	1,137,000	2,940,000	214,000	7,000	639,000	491,000	0	407	278,669
May	703,000	2,940,000	684,000	10,000	657,000	37,000	0	409	280,000
June	452,000	2,912,000	855,000	12,000	651,000	0	0	398	280,000
July	309,000	2,497,000	941,000	13,000	713,000	0	0	370	280,000
Aug.	248,000	1,852,000	855,000	10,000	787,000	0	0	332	280,000
Sept.	225,000	1,235,000	513,000	6,000	513,000	0	0	298	168,300
Oct.	269,000	941,000	171,000	4,000	171,000	0	0	294	53,400
Nov.	252,000	1,035,000	0	3,000	0	0	0	...	0
Dec.	347,000	1,284,000	0	0	0	0	0	...	0
Total or average	9,085,000		4,276,000	65,000	5,729,000	2,744,000	0	370	192,800
1915									
Jan.	895,000	1,631,000	0	0	0	0	0	...	0
Feb.	2,298,000	2,526,000	0	0	582,000	1,302,000	0	402	269,200
Mar.	1,264,000	2,940,000	43,000	0	666,000	598,000	0	404	280,000
April	1,159,000	2,940,000	214,000	7,000	642,000	510,000	0	406	280,000
May	1,256,000	2,940,000	684,000	10,000	662,000	562,000	0	406	280,000
June	572,000	2,940,000	855,000	12,000	645,000	0	0	403	280,000
July	343,000	2,645,000	941,000	14,000	701,000	0	0	379	280,000
Aug.	266,000	2,033,000	855,000	10,000	759,000	0	0	344	280,000
Sept.	215,000	1,434,000	513,000	6,000	513,000	0	0	314	177,500
Oct.	233,000	1,130,000	171,000	4,000	171,000	0	0	309	56,000
Nov.	254,000	1,188,000	0	3,000	0	0	0	...	0
Dec.	699,000	1,439,000	0	0	0	0	0	...	0
Total or average	9,454,000		4,276,000	66,000	5,341,000	2,972,000	0	374	181,100

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power p ant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1912
1,447,000	0	0	0	0	0	0	...	0	Jan.
1,964,000	0	0	0	0	0	0	...	0	Feb.
2,360,000	43,000	0	55,000	0	0	0	402	23,000	Mar.
2,940,000	214,000	7,000	455,000	0	25,000	0	411	199,900	April
2,940,000	684,000	10,000	659,000	0	58,000	0	408	280,000	May
2,902,000	855,000	12,000	654,000	0	0	0	396	280,000	June
2,440,000	941,000	13,000	719,000	0	0	0	366	280,000	July
1,760,000	855,000	9,000	806,000	0	0	0	325	280,000	Aug.
1,134,000	513,000	5,000	513,000	0	0	0	290	163,600	Sept.
858,000	171,000	3,000	171,000	0	0	0	284	51,500	Oct.
910,000	0	2,000	0	0	0	0	...	0	Nov.
1,340,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	61,000	4,032,000	0	83,000	0	360	150,200	Total or average
									1913
1,709,000	0	0	0	0	0	0	...	0	Jan.
2,472,000	0	0	135,000	0	0	0	400	62,500	Feb.
2,724,000	43,000	0	215,000	10,000	0	0	410	91,500	Mar.
2,940,000	214,000	7,000	626,000	0	52,000	0	409	274,300	April
2,940,000	684,000	10,000	663,000	0	0	0	406	280,000	May
2,767,000	855,000	11,000	666,000	0	0	0	388	280,000	June
2,222,000	941,000	12,000	744,000	0	0	0	352	280,000	July
1,532,000	855,000	8,000	800,000	0	0	0	306	260,400	Aug.
901,000	513,000	5,000	513,000	0	0	0	263	146,500	Sept.
573,000	171,000	3,000	171,000	0	0	0	249	44,500	Oct.
601,000	0	2,000	0	0	0	0	...	0	Nov.
915,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	58,000	4,533,000	10,000	52,000	0	352	143,600	Total or average
									1914
1,611,000	0	0	416,000	1,213,000	0	0	394	171,100	Jan.
2,779,000	0	0	612,000	752,000	0	0	394	280,000	Feb.
2,774,000	43,000	0	614,000	249,000	0	0	401	255,800	Mar.
2,898,000	214,000	7,000	627,000	0	461,000	0	407	273,200	April
2,940,000	684,000	10,000	657,000	0	37,000	0	409	280,000	May
2,912,000	855,000	12,000	651,000	0	0	0	398	280,000	June
2,497,000	941,000	13,000	713,000	0	0	0	370	280,000	July
1,852,000	855,000	10,000	787,000	0	0	0	332	280,000	Aug.
1,235,000	513,000	6,000	513,000	0	0	0	298	168,300	Sept.
941,000	171,000	4,000	171,000	0	0	0	294	53,400	Oct.
1,035,000	0	3,000	0	0	0	0	...	0	Nov.
1,284,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	65,000	5,761,000	2,214,000	498,000	0	369	192,900	Total or average
									1915
1,631,000	0	0	22,000	16,000	0	0	388	9,000	Jan.
2,488,000	0	0	620,000	1,475,000	0	0	386	278,100	Feb.
2,691,000	43,000	0	655,000	373,000	0	0	399	271,900	Mar.
2,927,000	214,000	7,000	642,000	32,000	465,000	0	405	280,000	April
2,940,000	684,000	10,000	662,000	0	562,000	0	406	280,000	May
2,940,000	855,000	12,000	645,000	0	0	0	403	280,000	June
2,645,000	941,000	14,000	701,000	0	0	0	379	280,000	July
2,033,000	855,000	10,000	759,000	0	0	0	344	280,000	Aug.
1,434,000	513,000	6,000	515,000	0	0	0	314	177,500	Sept.
1,130,000	171,000	4,000	171,000	0	0	0	309	56,000	Oct.
1,188,000	0	3,000	0	0	0	0	...	0	Nov.
1,439,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	66,000	5,390,000	1,896,000	1,027,000	0	372	181,900	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1916									
Jan.	1,166,000	2,138,000	0	0	171,000	193,000	0	406	72,000
Feb.	1,616,000	2,940,000	0	0	620,000	996,000	0	404	277,900
Mar.	1,215,000	2,940,000	43,000	0	663,000	552,000	0	406	280,000
April	678,000	2,940,000	214,000	7,000	614,000	57,000	0	409	269,200
May	485,000	2,940,000	684,000	10,000	662,000	0	0	406	280,000
June	353,000	2,731,000	855,000	11,000	666,000	0	0	387	280,000
July	316,000	2,218,000	941,000	12,000	741,000	0	0	354	280,000
Aug.	244,000	1,581,000	855,000	9,000	806,000	0	0	311	266,900
Sept.	213,000	961,000	513,000	5,000	513,000	0	0	271	151,800
Oct.	236,000	656,000	171,000	3,000	171,000	0	0	262	47,000
Nov.	242,000	718,000	0	2,000	0	0	0	...	0
Dec.	363,000	958,000	0	0	0	0	0	...	0
Total or average	7,127,000		4,276,000	59,000	5,627,000	1,798,000	0	358	183 300
1917									
Jan.	312,000	1,321,000	0	0	0	0	0	...	0
Feb.	760,000	1,633,000	0	0	0	0	0	...	0
Mar.	459,000	2,393,000	43,000	0	43,000	0	0	400	17,900
April	906,000	2,809,000	214,000	7,000	537,000	231,000	0	408	234,400
May	580,000	2,940,000	684,000	10,000	659,000	5,000	0	409	280,000
June	329,000	2,821,000	855,000	11,000	660,000	0	0	391	280,000
July	238,000	2,284,000	941,000	12,000	738,000	0	0	356	280,000
Aug.	214,000	1,569,000	855,000	9,000	805,000	0	0	308	263,400
Sept.	185,000	919,000	513,000	5,000	513,000	0	0	265	147,600
Oct.	200,000	586,000	171,000	3,000	171,000	0	0	250	44,600
Nov.	224,000	612,000	0	2,000	0	0	0	...	0
Dec.	298,000	834,000	0	0	0	0	0	...	0
Total or average	4,705,000		4,276,000	59,000	4,124,000	236,000	0	348	129,700
1918									
Jan.	249,000	1,132,000	0	0	0	0	0	...	0
Feb.	399,000	1,381,000	0	0	0	0	0	...	0
Mar.	772,000	1,780,000	43,000	0	43,000	0	0	372	16,900
April	556,000	2,509,000	214,000	7,000	214,000	0	0	403	92,500
May	314,000	2,844,000	684,000	10,000	673,000	0	0	399	280,000
June	232,000	2,464,000	855,000	11,000	630,000	0	0	369	280,000
July	200,000	1,830,000	941,000	10,000	806,000	0	0	324	280,000
Aug.	192,000	1,079,000	855,000	7,000	732,000	0	0	258	197,400
Sept.	186,000	409,000	513,000	3,000	0	0	0	...	0
Oct.	258,000	79,000	171,000	1,000	0	0	0	...	0
Nov.	246,000	165,000	0	1,000	0	0	0	...	0
Dec.	258,000	410,000	0	0	0	0	0	...	0
Total or average	3,862,000		4,276,000	50,000	3,158,000	0	0	354	96,400
1919									
Jan.	587,000	668,000	0	0	0	0	0	...	0
Feb.	1,163,000	1,255,000	0	0	0	0	0	...	0
Mar.	959,000	2,418,000	43,000	0	340,000	97,000	0	407	143,100
April	752,000	2,940,000	214,000	7,000	627,000	118,000	0	410	274,300
May	438,000	2,940,000	684,000	10,000	666,000	0	0	404	280,000
June	252,000	2,684,000	855,000	11,000	675,000	0	0	381	280,000
July	219,000	2,070,000	941,000	11,000	766,000	0	0	342	280,000
Aug.	199,000	1,337,000	855,000	8,000	775,000	0	0	286	235,500
Sept.	168,000	673,000	513,000	4,000	513,000	0	0	230	124,600
Oct.	203,000	324,000	171,000	2,000	171,000	0	0	210	35,600
Nov.	186,000	354,000	0	1,000	0	0	0	...	0
Dec.	180,000	539,000	0	0	0	0	0	...	0
Total or average	5,306,000		4,276,000	54,000	4,533,000	215,000	0	334	138,500

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1916
2,138,000	0	0	397,000	415,000	0	0	386	160,900	Jan.
2,492,000	0	0	646,000	920,000	0	0	384	278,500	Feb.
2,542,000	43,000	0	616,000	263,000	0	0	396	254,300	Mar.
2,878,000	214,000	7,000	572,000	0	37,000	0	410	251,100	April
2,940,000	684,000	10,000	662,000	0	0	0	406	280,000	May
2,731,000	855,000	11,000	666,000	0	0	0	387	280,000	June
2,218,000	941,000	12,000	741,000	0	0	0	354	280,000	July
1,581,000	855,000	9,000	806,000	0	0	0	311	266,900	Aug.
961,000	513,000	5,000	513,000	0	0	0	271	151,800	Sept.
656,000	171,000	3,000	171,000	0	0	0	262	47,000	Oct.
718,000	0	2,000	0	0	0	0	...	0	Nov.
978,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	5,790,000	1,598,000	37,000	0	355	187,200	Total or average
									1917
1,321,000	0	0	0	0	0	0	...	0	Jan.
1,633,000	0	0	0	0	0	0	...	0	Feb.
2,333,000	43,000	0	43,000	0	0	0	400	17,900	Mar.
2,809,000	214,000	7,000	537,000	0	221,000	0	408	234,400	April
2,940,000	684,000	10,000	659,000	0	5,000	0	403	280,000	May
2,821,000	855,000	11,000	660,000	0	0	0	391	280,000	June
2,284,000	941,000	12,000	738,000	0	0	0	356	280,000	July
1,569,000	855,000	9,000	803,000	0	0	0	308	263,400	Aug.
919,000	513,000	5,000	513,000	0	0	0	265	147,600	Sept.
586,000	171,000	3,000	171,000	0	0	0	250	44,600	Oct.
612,000	0	2,000	0	0	0	0	...	0	Nov.
834,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	4,124,000		236,000	0	348	129,700	Total or average
									1918
1,122,000	0	0	0	0	0	0	...	0	Jan.
1,381,000	0	0	0	0	0	0	...	0	Feb.
1,780,000	43,000	0	43,000	0	0	0	372	16,900	Mar.
2,509,000	214,000	7,000	214,000	0	0	0	403	92,500	April
2,844,000	684,000	10,000	673,000	0	0	0	399	280,000	May
2,464,000	855,000	11,000	690,000	0	0	0	389	280,000	June
1,830,000	941,000	10,000	806,000	0	0	0	324	280,000	July
1,079,000	855,000	7,000	732,000	0	0	0	258	197,400	Aug.
409,000	513,000	3,000	0	0	0	0	...	0	Sept.
79,000	171,000	1,000	0	0	0	0	...	0	Oct.
165,000	0	1,000	0	0	0	0	...	0	Nov.
410,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	59,000	3,158,000	0	0	0	354	96,400	Total or average
									1919
668,000	0	0	0	0	0	0	...	0	Jan.
1,255,000	0	0	0	0	0	0	...	0	Feb.
2,418,000	43,000	0	507,000	45,000	0	0	398	209,800	Mar.
2,825,000	214,000	7,000	592,000	3,000	35,000	0	409	258,600	April
2,940,000	684,000	10,000	666,000	0	0	0	404	280,000	May
2,684,000	855,000	11,000	675,000	0	0	0	381	280,000	June
2,070,000	941,000	11,000	766,000	0	0	0	342	280,000	July
1,337,000	855,000	8,000	775,000	0	0	0	286	235,500	Aug.
673,000	513,000	4,000	513,000	0	0	0	230	124,000	Sept.
324,000	171,000	2,000	171,000	0	0	0	210	35,600	Oct.
354,000	0	1,000	0	0	0	0	...	0	Nov.
539,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	54,000	4,665,000	48,000	35,000	0	332	142,900	Total or average

TABLE 2a (Continued). KENNETT

WATER AND POWER YIELD, OPERATING PRIMARILY FOR
BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1920									
Jan.	207,000	719,000	0	0	0	0	0	...	0
Feb.	176,000	926,000	0	0	0	0	0	...	0
Mar.	372,000	1,102,000	43,000	0	43,000	0	0	318	14,500
April	493,000	1,431,000	214,000	5,000	214,000	0	0	340	80,100
May	286,000	1,705,000	684,000	7,000	684,000	0	0	333	243,300
June	216,000	1,300,000	855,000	7,000	747,000	0	0	285	233,300
July	192,000	654,000	841,000	5,000	291,000	0	100,000	231	69,100
Aug.	176,000	0	176,000	0	0	0	679,000	...	0
Sept.	140,000	0	140,000	0	0	0	373,000	...	0
Oct.	180,000	0	168,000	0	0	0	3,000	...	0
Nov.	896,000	12,000	0	0	0	0	0	...	0
Dec.	1,121,000	908,000	0	0	0	0	0	...	0
Total or average	4,455,000		3,121,000	24,000	1,979,000	0	1,155,000	315	53,400
1921									
Jan.	1,492,000	2,029,000	0	0	162,000	419,000	0	402	67,700
Feb.	1,035,000	2,940,000	0	0	602,000	433,000	0	404	280,000
Mar.	982,000	2,940,000	43,000	0	660,000	322,000	0	407	280,000
April	559,000	2,940,000	214,000	7,000	540,000	12,000	0	410	236,500
May	493,000	2,940,000	684,000	10,000	663,000	0	0	406	280,000
June	316,000	2,739,000	855,000	11,000	666,000	0	0	387	280,000
July	220,000	2,189,000	941,000	12,000	750,000	0	0	349	280,000
Aug.	192,000	1,456,000	855,000	8,000	787,000	0	0	298	249,200
Sept.	175,000	785,000	513,000	4,000	513,000	0	0	247	136,300
Oct.	196,000	443,000	171,000	2,000	171,000	0	0	229	40,100
Nov.	205,000	466,000	0	2,000	0	0	0	...	0
Dec.	390,000	669,000	0	0	0	0	0	...	0
Total or average	6,255,000		4,276,000	56,000	5,514,000	1,186,000	0	350	176,800
1922									
Jan.	300,000	1,059,000	0	0	0	0	0	...	0
Feb.	679,000	1,359,000	0	0	0	0	0	...	0
Mar.	567,000	2,038,000	43,000	0	43,000	0	0	383	17,300
April	604,000	2,562,000	214,000	7,000	219,000	0	0	410	95,600
May	577,000	2,940,000	684,000	10,000	660,000	0	0	409	280,000
June	317,000	2,823,000	855,000	11,000	660,000	0	0	390	280,000
July	203,000	2,274,000	941,000	12,000	741,000	0	0	354	280,000
Aug.	182,000	1,524,000	855,000	8,000	794,000	0	0	302	255,400
Sept.	161,000	843,000	513,000	4,000	513,000	0	0	254	140,400
Oct.	208,000	487,000	171,000	2,000	171,000	0	0	237	41,800
Nov.	244,000	522,000	0	2,000	0	0	0	...	0
Dec.	462,000	764,000	0	0	0	0	0	...	0
Total or average	4,501,000		4,276,000	56,000	3,801,000	0	0	342	116,700
1923									
Jan.	467,000	1,226,000	0	0	0	0	0	...	0
Feb.	297,000	1,693,000	0	0	0	0	0	...	0
Mar.	287,000	1,990,000	43,000	0	43,000	0	0	375	16,900
April	632,000	2,234,000	214,000	6,000	214,000	0	0	393	90,700
May	322,000	2,646,000	684,000	10,000	684,000	0	0	389	278,600
June	236,000	2,274,000	855,000	10,000	708,000	0	0	360	280,000
July	184,000	1,645,000	941,000	10,000	803,000	0	0	309	264,300
Aug.	165,000	878,000	855,000	6,000	682,000	0	0	224	154,200
Sept.	157,000	182,000	338,000	1,000	0	0	175,000	...	0
Oct.	187,000	0	171,000	0	0	0	0	...	0
Nov.	176,000	16,000	0	0	0	0	0	...	0
Dec.	184,000	192,000	0	0	0	0	0	...	0
Total or average	3,294,000		4,101,000	43,000	3,134,000	0	175,000	341	91,100

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet no) deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1920
719,000	0	0	0	0	0	0	...	0	Jan.
926,000	0	0	0	0	0	0	...	0	Feb.
1,102,000	43,000	0	43,000	0	0	0	318	14,500	Mar.
1,431,000	214,000	5,000	214,000	0	0	0	340	80,100	April
1,705,000	684,000	7,000	684,000	0	0	0	333	243,300	May
1,300,000	855,000	7,000	747,000	0	0	0	285	233,300	June
654,000	841,000	5,000	291,000	0	0	100,000	231	69,100	July
0	176,000	0	0	0	0	679,000	...	0	Aug.
0	140,000	0	0	0	0	373,000	...	0	Sept.
0	168,000	0	0	0	0	3,000	...	0	Oct.
12,000	0	0	0	0	0	0	...	0	Nov.
908,000	0	0	0	0	0	0	...	0	Dec.
	3,121,000	24,000	1,979,000	0	0	1,155,000	315	53,400	Total or average
									1921
2,029,000	0	0	331,000	537,000	0	0	388	134,700	Jan.
2,653,000	0	0	618,000	508,000	0	0	389	289,000	Feb.
2,562,000	43,000	0	675,000	47,000	0	0	397	280,000	Mar.
2,822,000	214,000	7,000	434,000	0	0	0	411	190,600	April
2,940,000	684,000	10,000	663,000	0	0	0	406	280,000	May
2,739,000	855,000	11,000	666,000	0	0	0	387	280,000	June
2,189,000	941,000	12,000	750,000	0	0	0	349	280,000	July
1,456,000	855,000	8,000	787,000	0	0	0	298	249,200	Aug.
785,000	513,000	4,000	513,000	0	0	0	247	136,300	Sept.
443,000	171,000	2,000	171,000	0	0	0	229	40,100	Oct.
466,000	0	2,000	0	0	0	0	...	0	Nov.
669,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	56,000	5,608,000	1,092,000	0	0	348	178,700	Total or average
									1922
1,059,000	0	0	0	0	0	0	...	0	Jan.
1,359,000	0	0	0	0	0	0	...	0	Feb.
2,038,000	43,000	0	43,000	0	0	0	383	17,300	Mar.
2,562,000	214,000	7,000	213,000	0	0	0	410	95,600	April
2,940,000	684,000	10,000	660,000	0	0	0	409	280,000	May
2,823,000	855,000	11,000	660,000	0	0	0	330	280,000	June
2,274,000	941,000	12,000	741,000	0	0	0	354	280,000	July
1,524,000	855,000	8,000	794,000	0	0	0	302	255,400	Aug.
843,000	513,000	4,000	513,000	0	0	0	254	140,400	Sept.
487,000	171,000	2,000	171,000	0	0	0	237	41,800	Oct.
522,000	0	2,000	0	0	0	0	...	0	Nov.
764,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	56,000	3,801,000	0	0	0	342	116,700	Total or average
									1923
1,226,000	0	0	0	0	0	0	...	0	Jan.
1,693,000	0	0	0	0	0	0	...	0	Feb.
1,990,000	43,000	0	43,000	0	0	0	375	16,900	Mar.
2,231,000	214,000	6,000	214,000	0	0	0	333	90,700	April
2,646,000	684,000	10,000	684,000	0	0	0	389	278,600	May
2,274,000	855,000	10,000	708,000	0	0	0	360	280,000	June
1,645,000	941,000	10,000	803,000	0	0	0	309	264,300	July
878,000	855,000	6,000	682,000	0	0	0	224	154,200	Aug.
182,000	338,000	1,000	0	0	0	175,000	...	0	Sept.
0	171,000	0	0	0	0	0	...	0	Oct.
16,000	0	0	0	0	0	0	...	0	Nov.
192,000	0	0	0	0	0	0	...	0	Dec.
	4,101,000	43,000	3,134,000	0	0	175,000	341	91,100	Total or average

TABLE 2a (Concluded). KENNETT
WATER AND POWER YIELD, OPERATING PRIMARILY FOR
BOTH
WITH AND WITHOUT FLOOD CONTROL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet.
Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1924									
Jan.	203,000	376,000	0	0	0	0	0	...	0
Feb.	332,000	579,000	0	0	0	0	0	...	0
Mar.	200,000	911,000	43,000	0	43,000	0	0	295	13,400
April	176,000	1,068,000	214,000	4,000	214,000	0	0	301	70,700
May	155,000	1,026,000	684,000	5,000	684,000	0	0	265	191,400
June	141,000	492,000	629,000	4,000	131,000	0	226,000	220	30,000
July	140,000	0	140,000	0	0	0	801,000	...	0
Aug.	140,000	0	140,000	0	0	0	715,000	...	0
Sept.	128,000	0	128,000	0	0	0	385,000	...	0
Oct.	178,000	0	158,000	0	0	0	13,000	...	0
Nov.	317,000	20,000	0	0	0	0	0	...	0
Dec.	321,000	337,000	0	0	0	0	0	...	0
Total or average	2,431,000		2,136,000	13,000	1,072,000	0	2,140,000	283	25,600
1925									
Jan.	301,000	658,000	0	0	0	0	0	...	0
Feb.	1,769,000	959,000	0	0	0	0	0	...	0
Mar.	563,000	2,728,000	43,000	0	338,000	13,000	0	411	143,800
April	926,000	2,940,000	214,000	7,000	635,000	284,000	0	408	277,500
May	474,000	2,940,000	684,000	10,000	663,000	0	0	405	280,000
June	276,000	2,720,000	855,000	11,000	660,000	0	0	384	280,000
July	173,000	2,130,000	941,000	11,000	763,000	0	0	394	280,000
Aug.	167,000	1,351,000	855,000	8,000	772,000	0	0	286	234,100
Sept.	163,000	655,000	513,000	4,000	513,000	0	0	227	122,400
Oct.	181,000	301,000	171,000	2,000	0	0	0	...	0
Nov.	192,000	309,000	0	1,000	0	0	0	...	0
Dec.	235,000	509,000	0	0	0	0	0	...	0
Total or average	5,420,000		4,276,000	54,000	4,353,000	297,000	0	352	135,500
Total for 30-year period, 1896-1926	188,012,000		124,570,000	1,641,000	136,102,000	33,036,000	3,710,000		
Average for 30-year period, 1896-1926	6,267,000		4,152,000	55,000	4,537,000	1,103,000	124,000	353.4	145,300

RESERVOIR ON SACRAMENTO RIVER.

IRRIGATION WITH INCIDENTAL POWER GENERATION

BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 2, page 110.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1924
376,000	0	0	0	0	0	0	...	0	Jan.
379,000	0	0	0	0	0	0	...	0	Feb.
911,000	43,000	0	43,000	0	0	0	295	13,400	Mar.
1,068,000	214,000	4,000	214,000	0	0	0	301	70,700	April
1,026,000	684,000	5,000	684,000	0	0	0	265	191,400	May
492,000	629,000	4,000	131,000	0	0	226,000	220	30,000	June
0	140,000	0	0	0	0	801,000	...	0	July
0	140,000	0	0	0	0	715,000	...	0	Aug.
0	128,000	0	0	0	0	385,000	...	0	Sept.
0	158,000	0	0	0	0	13,000	...	0	Oct.
20,000	0	0	0	0	0	0	...	0	Nov.
337,000	0	0	0	0	0	0	...	0	Dec.
	2,136,000	13,000	1,072,000	0	0	2,140,000	283	25,600	Total or average
									1925
658,000	0	0	0	0	0	0	...	0	Jan.
959,000	0	0	111,000	89,000	0	0	387	49,900	Feb.
2,528,000	43,000	0	239,000	36,000	0	0	401	98,800	Mar.
2,816,000	214,000	7,000	588,000	27,000	180,000	0	408	256,900	April
2,940,000	684,000	10,000	663,000	0	0	0	405	280,000	May
2,720,000	855,000	11,000	669,000	0	0	0	384	280,000	June
2,130,000	941,000	11,000	763,000	0	0	0	344	280,000	July
1,351,000	855,000	8,000	772,000	0	0	0	286	234,100	Aug.
655,000	513,000	4,000	513,000	0	0	0	227	122,400	Sept.
301,000	171,000	2,000	0	0	0	0	...	0	Oct.
309,000	0	1,000	0	0	0	0	...	0	Nov.
500,000	0	0	0	0	0	0	...	0	Dec.
	4,276,000	54,000	4,318,000	152,000	180,000	0	352	133,900	Total or average
	124,570,000	1,641,000	136,982,000	26,574,000	5,642,000	3,710,000			Total for 30-year period, 1896-1926
	4,152,000	55,000	4 566,000	886,000	188,000	124,000	352.9	145.60	Average for 30-year period, 1896-1926

TABLE 3a. KENNETT RESER

COMPARISON OF WATER YIELD FOR TWO METHODS OF

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1896							
Jan.	1,980,000	1,860,000	0	0	1,331,000	0	0
Feb.	474,000	2,509,000	0	0	264,000	0	0
Mar.	738,000	2,719,000	43,000	0	172,000	302,000	0
April	891,000	2,940,000	214,000	7,000	0	670,000	0
May	1,194,000	2,940,000	684,000	10,000	0	500,000	0
June	536,000	2,940,000	855,000	12,000	0	0	0
July	313,000	2,609,000	941,000	13,000	0	0	0
Aug.	268,000	1,968,000	855,000	10,000	0	0	0
Sept.	258,000	1,371,000	513,000	6,000	0	0	0
Oct.	262,000	1,110,000	171,000	4,000	0	0	0
Nov.	472,000	1,197,000	0	3,000	0	0	0
Dec.	920,000	1,666,000	0	0	0	0	0
Total or average	8,306,000		4,276,000	65,000	1,767,000	1,472,000	0
1897							
Jan.	577,000	2,586,000	0	0	655,000	0	0
Feb.	1,338,000	2,508,000	0	0	1,316,000	0	0
Mar.	737,000	2,530,000	43,000	0	413,000	0	0
April	858,000	2 811,000	214,000	7,000	29,000	479,000	0
May	554,000	2,940,000	684,000	10,000	0	3,000	0
June	310,000	2,797,000	855,000	11,000	0	0	0
July	275,000	2,241,000	941,000	12,000	0	0	0
Aug.	254,000	1,563,000	855,000	9,000	0	0	0
Sept.	247,000	953,000	513,000	5,000	0	0	0
Oct.	262,000	682,000	171,000	3,000	0	0	0
Nov.	274,000	770,000	0	2,000	0	0	0
Dec.	366,000	1,042,000	0	0	0	0	0
Total or average	6,052,000		4,276,000	59,000	2,413,000	482000	0
1898							
Jan.	257,000	1,408,000	0	0	0	0	0
Feb.	478,000	1,665,000	0	0	0	0	0
Mar.	380,000	2,142,000	43,000	0	0	0	0
April	274,000	2,480,000	214,000	7,000	0	0	0
May	300,000	2,533,000	684,000	9,000	0	0	0
June	304,000	2,140,000	855,000	10,000	0	0	0
July	257,000	1,579,000	941,000	9,000	0	0	0
Aug.	225,000	866,000	855,000	6,000	0	0	0
Sept.	198,000	230,000	426,000	2,000	0	0	87,000
Oct.	221,000	0	171,000	0	0	0	0
Nov.	217,000	50,000	0	0	0	0	0
Dec.	217,000	267,000	0	0	0	0	0
Total or average	3,308,000		4,189,000	43,000	0	0	87,000
1899							
Jan.	605,000	484,000	0	0	0	0	0
Feb.	253,000	1,089,000	0	0	0	0	0
Mar.	900,000	1,342,000	43,000	0	0	0	0
April	456,000	2,199,000	214,000	6,000	0	0	0
May	330,000	2,435,000	684,000	9,000	0	0	0
June	302,000	2,072,000	855,000	9,000	0	0	0
July	240,000	1,510,000	941,000	9,000	0	0	0
Aug.	224,000	800,000	855,000	5,000	0	0	0
Sept.	197,000	164,000	360,000	1,000	0	0	153,000
Oct.	252 000	0	171,000	0	0	0	0
Nov.	645,000	81,000	0	0	0	0	0
Dec.	646,000	726,000	0	0	0	0	0
Total or average	5,050,000		4,123,000	39,000	0	0	153,000

VOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irr'gation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1896
1,860,000	0	0	1,354,000	0	0	Jan.
2,486,000	0	0	474,000	0	0	Feb.
2,486,000	43,000	0	695,000	0	0	Mar.
2,486,000	214,000	7,000	137,000	79,000	0	April
2,940,000	684,000	10,000	0	500,000	0	May
2,940,000	855,000	12,000	0	0	0	June
2,609,000	941,000	13,000	0	0	0	July
1,968,000	855,000	10,000	0	0	0	Aug.
1,371,000	513,000	6,000	0	0	0	Sept.
1,110,000	171,000	4,000	0	0	0	Oct.
1,197,000	0	3,000	0	0	0	Nov.
1,666,000	0	0	100,000	0	0	Dec.
	4,276,000	65,000	2,760,000	579,000	0	Total or average
						1897
2,486,000	0	0	577,000	0	0	Jan.
2,486,000	0	0	1,338,000	0	0	Feb.
2,486,000	43,000	0	694,000	0	0	Mar.
2,486,000	214,000	7,000	138,000	45,000	0	April
2,940,000	684,000	10,000	0	3,000	0	May
2,797,000	855,000	11,000	0	0	0	June
2,241,000	941,000	12,000	0	0	0	July
1,563,000	855,000	9,000	0	0	0	Aug.
953,000	513,000	5,000	0	0	0	Sept.
682,000	171,000	3,000	0	0	0	Oct.
770,000	0	2,000	0	0	0	Nov.
1,042,000	0	0	0	0	0	Dec.
	4,276,000	59,000	2,747,000	48,000	0	Total or average
						1898
1,408,000	0	0	0	0	0	Jan.
1,665,000	0	0	0	0	0	Feb.
2,143,000	43,000	0	0	0	0	Mar.
2,480,000	214,000	7,000	5,000	0	0	April
2,528,000	684,000	9,000	0	0	0	May
2,135,000	855,000	10,000	0	0	0	June
1,574,000	941,000	9,000	0	0	0	July
861,000	855,000	6,000	0	0	0	Aug.
225,000	421,000	2,000	0	0	92,000	Sept.
0	171,000	0	0	0	0	Oct.
50,000	0	0	0	0	0	Nov.
267,000	0	0	0	0	0	Dec.
	4,184,000	43,000	5,000	0	92,000	Total or average
						1899
484,000	0	0	0	0	0	Jan.
1,089,000	0	0	0	0	0	Feb.
1,342,000	43,000	0	0	0	0	Mar.
2,199,000	214,000	6,000	0	0	0	April
2,435,000	684,000	9,000	0	0	0	May
2,072,000	855,000	9,000	0	0	0	June
1,510,000	941,000	9,000	0	0	0	July
800,000	855,000	5,000	0	0	0	Aug.
164,000	360,000	1,000	0	0	153,000	Sept.
0	171,000	0	0	0	0	Oct.
81,000	0	0	0	0	0	Nov.
726,000	0	0	0	0	0	Dec.
	4,123,000	39,000	0	0	153,000	Total or average

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1900							
Jan.	1,299,000	1,372,000	0	0	181,000	0	0
Feb.	391,000	2,490,000	0	0	302,000	0	0
Mar.	912,000	2,579,000	43,000	0	570,000	0	0
April	457,000	2,878,000	214,000	7,000	0	174,000	0
May	413,000	2,940,000	684,000	10,000	0	0	0
June	247,000	2,659,000	855,000	11,000	0	0	0
July	219,000	2,040,000	941,000	11,000	0	0	0
Aug.	208,000	1,307,000	855,000	8,000	0	0	0
Sept.	201,000	652,000	513,000	4,000	0	0	0
Oct.	308,000	336,000	171,000	2,000	0	0	0
Nov.	368,000	471,000	0	2,000	0	0	0
Dec.	697,000	837,000	0	0	0	0	0
Total or average	5,720,000		4,276,000	55,000	1,053,000	174,000	0
1901							
Jan.	895,000	1,534,000	0	0	0	0	0
Feb.	1,304,000	2,429,000	0	0	1,192,000	0	0
Mar.	749,000	2,541,000	43,000	0	443,000	0	0
April	382,000	2,804,000	214,000	7,000	0	25,000	0
May	411,000	2,940,000	684,000	10,000	0	0	0
June	240,000	2,657,000	855,000	11,000	0	0	0
July	218,000	2,031,000	941,000	11,000	0	0	0
Aug.	206,000	1,297,000	855,000	8,000	0	0	0
Sept.	200,000	640,000	513,000	4,000	0	0	0
Oct.	215,000	323,000	171,000	2,000	0	0	0
Nov.	354,000	365,000	0	1,000	0	0	0
Dec.	550,000	718,000	0	0	0	0	0
Total or average	5,724,000		4,276,000	54,000	1,635,000	25,000	0
1902							
Jan.	227,000	1,268,000	0	0	0	0	0
Feb.	2,782,000	1,495,000	0	0	1,711,000	0	0
Mar.	1,115,000	2,566,000	43,000	0	796,000	0	0
April	891,000	2,842,000	214,000	7,000	0	572,000	0
May	765,000	2,940,000	684,000	10,000	0	105,000	0
June	407,000	2,906,000	855,000	12,000	0	0	0
July	254,000	2,446,000	941,000	13,000	0	0	0
Aug.	234,000	1,746,000	855,000	9,000	0	0	0
Sept.	184,000	1,116,000	513,000	5,000	0	0	0
Oct.	235,000	782,000	171,000	3,000	0	0	0
Nov.	829,000	843,000	0	2,000	0	0	0
Dec.	762,000	1,670,000	0	0	0	0	0
Total or average	8,685,000		4,276,000	61,000	2,507,000	677,000	0
1903							
Jan.	1,113,000	2,432,000	0	0	1,056,000	0	0
Feb.	633,000	2,489,000	0	0	574,000	0	0
Mar.	1,339,000	2,548,000	43,000	0	1,032,000	0	0
April	765,000	2,812,000	214,000	7,000	111,000	305,000	0
May	458,000	2,940,000	684,000	10,000	0	0	0
June	278,000	2,704,000	855,000	11,000	0	0	0
July	231,000	2,116,000	941,000	11,000	0	0	0
Aug.	204,000	1,395,000	855,000	8,000	0	0	0
Sept.	174,000	736,000	513,000	4,000	0	0	0
Oct.	199,000	393,000	171,000	2,000	0	0	0
Nov.	924,000	419,000	0	1,000	0	0	0
Dec.	530,000	1,342,000	0	0	0	0	0
Total or average	6,848,000		4,276,000	54,000	2,773,000	305,000	0

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (451,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1900
1,372,000	0	0	185,000	0	0	Jan.
2,486,000	0	0	391,000	0	0	Feb.
2,486,000	43,000	0	869,000	0	0	Mar.
2,486,000	214,000	7,000	61,000	0	0	April
2,661,000	684,000	10,000	0	0	0	May
2,380,000	855,000	10,000	0	0	0	June
1,762,000	941,000	10,000	0	0	0	July
1,030,000	855,000	6,000	0	0	0	Aug.
377,000	513,000	3,000	0	0	0	Sept.
62,000	171,000	0	0	0	0	Oct.
199,000	0	1,000	0	0	0	Nov.
566,000	0	0	0	0	0	Dec.
	4,276,000	47,000	1,506,000	0	0	Total or average
						1901
1,263,000	0	0	0	0	0	Jan.
2,158,000	0	0	976,000	0	0	Feb.
2,486,000	43,000	0	706,000	0	0	Mar.
2,486,000	214,000	7,000	45,000	0	0	April
2,602,000	684,000	9,000	0	0	0	May
2,320,000	855,000	10,000	0	0	0	June
1,695,000	941,000	10,000	0	0	0	July
962,000	855,000	6,000	0	0	0	Aug.
307,000	505,000	2,000	0	0	8,000	Sept.
0	171,000	0	0	0	0	Oct.
44,000	0	0	0	0	0	Nov.
398,000	0	0	0	0	0	Dec.
	4,268,000	44,000	1,727,000	0	8,000	Total or average
						1902
948,000	0	0	0	0	0	Jan.
1,175,000	0	0	1,471,000	0	0	Feb.
2,486,000	43,000	0	1,072,000	0	0	Mar.
2,486,000	214,000	7,000	162,000	54,000	0	April
2,940,000	684,000	10,000	0	105,000	0	May
2,906,000	855,000	12,000	0	0	0	June
2,446,000	941,000	13,000	0	0	0	July
1,746,000	855,000	9,000	0	0	0	Aug.
1,116,000	513,000	5,000	0	0	0	Sept.
782,000	171,000	3,000	0	0	0	Oct.
843,000	0	2,000	0	0	0	Nov.
1,670,000	0	0	0	0	0	Dec.
	4,276,000	61,000	2,705,000	159,000	0	Total or average
						1903
2,432,000	0	0	1,059,000	0	0	Jan.
2,486,000	0	0	633,000	0	0	Feb.
2,486,000	43,000	0	1,296,000	0	0	Mar.
2,486,000	214,000	7,000	218,000	0	0	April
2,812,000	684,000	10,000	0	0	0	May
2,576,000	855,000	11,000	0	0	0	June
1,988,000	941,000	11,000	0	0	0	July
1,267,000	855,000	7,000	0	0	0	Aug.
609,000	513,000	4,000	0	0	0	Sept.
266,000	171,000	2,000	0	0	0	Oct.
292,000	0	1,000	0	0	0	Nov.
1,215,000	0	0	0	0	0	Dec.
	4,276,000	53,000	3,206,000	0	0	Total or average

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1904							
Jan.	473,000	1,872,000	0	0	0	0	0
Feb.	1,742,000	2,345,000	0	0	1,557,000	0	0
Mar.	2,877,000	2,530,000	43,000	0	2,506,000	0	0
April	1,467,000	2,858,000	214,000	7,000	201,000	963,000	0
May	914,000	2,940,000	684,000	10,000	0	220,000	0
June	505,000	2,940,000	855,000	12,000	0	0	0
July	377,000	2,578,000	941,000	13,000	0	0	0
Aug.	282,000	2,001,000	855,000	10,000	0	0	0
Sept.	271,000	1,418,000	513,000	6,000	0	0	0
Oct.	491,000	1,170,000	171,000	4,000	0	0	0
Nov.	379,000	1,486,000	0	3,000	0	0	0
Dec.	600,000	1,862,000	0	0	0	0	0
Total or average	10,378,000		4,276,000	65,000	4,264,000	1,183,000	0
1905							
Jan.	1,371,000	2,462,000	0	0	1,201,000	0	0
Feb.	1,027,000	2,632,000	0	0	1,060,000	0	0
Mar.	1,335,000	2,599,000	43,000	0	970,000	0	0
April	753,000	2,921,000	214,000	7,000	47,000	466,000	0
May	560,000	2,940,000	684,000	10,000	0	0	0
June	365,000	2,806,000	855,000	11,000	0	0	0
July	269,000	2,305,000	941,000	12,000	0	0	0
Aug.	236,000	1,621,000	855,000	9,000	0	0	0
Sept.	208,000	993,000	513,000	5,000	0	0	0
Oct.	221,000	683,000	171,000	3,000	0	0	0
Nov.	229,000	730,000	0	2,000	0	0	0
Dec.	249,000	957,000	0	0	0	0	0
Total or average	6,823,000		4,276,000	59,000	3,278,000	466,000	0
1906							
Jan.	851,000	1,206,000	0	0	0	0	0
Feb.	872,000	2,057,000	0	0	323,000	0	0
Mar.	1,646,000	2,606,000	43,000	0	1,374,000	0	0
April	995,000	2,835,000	214,000	7,000	190,000	479,000	0
May	817,000	2,940,000	684,000	10,000	0	123,000	0
June	756,000	2,940,000	855,000	12,000	0	44,000	0
July	362,000	2,785,000	941,000	14,000	0	0	0
Aug.	280,000	2,192,000	855,000	11,000	0	0	0
Sept.	247,000	1,606,000	513,000	7,000	0	0	0
Oct.	251,000	1,333,000	171,000	5,000	0	0	0
Nov.	256,000	1,408,000	0	3,000	0	0	0
Dec.	648,000	1,661,000	0	0	0	0	0
Total or average	7,981,000		4,276,000	69,000	1,887,000	646,000	0
1907							
Jan.	936,000	2,309,000	0	0	757,000	0	0
Feb.	1,636,000	2,488,000	0	0	1,594,000	0	0
Mar.	2,115,000	2,530,000	43,000	0	1,784,000	0	0
April	1,250,000	2,818,000	214,000	7,000	250,000	657,000	0
May	646,000	2,940,000	684,000	10,000	0	8,000	0
June	421,000	2,884,000	855,000	12,000	0	0	0
July	334,000	2,438,000	941,000	13,000	0	0	0
Aug.	291,000	1,818,000	855,000	10,000	0	0	0
Sept.	252,000	1,244,000	513,000	6,000	0	0	0
Oct.	261,000	977,000	171,000	4,000	0	0	0
Nov.	256,000	1,063,000	0	3,000	0	0	0
Dec.	479,000	1,316,000	0	0	0	0	0
Total or average	8,877,000		4,276,000	65,000	4,385,000	665,000	0

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction) for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1904
1,745,000	0	0	0	0	0	Jan.
2,218,000	0	0	1,474,000	0	0	Feb.
2,486,000	43,000	0	2,834,000	0	0	Mar.
2,486,000	214,000	7,000	326,000	466,000	0	April
2,940,000	684,000	10,000	0	220,000	0	May
2,940,000	855,000	12,000	0	0	0	June
2,578,000	941,000	13,000	0	0	0	July
2,001,000	855,000	10,000	0	0	0	Aug.
1,418,000	513,000	6,000	0	0	0	Sept.
1,170,000	171,000	4,000	0	0	0	Oct.
1,486,000	0	3,000	0	0	0	Nov.
1,862,000	0	0	0	0	0	Dec.
	4,276,000	65,000	4,634,000	686,000	0	Total or average
						1905
2,462,000	0	0	1,347,000	0	0	Jan.
2,486,000	0	0	1,027,000	0	0	Feb.
2,486,000	43,000	0	1,292,000	0	0	Mar.
2,486,000	214,000	7,000	196,000	0	0	April
2,822,000	684,000	10,000	0	0	0	May
2,688,000	855,000	11,000	0	0	0	June
2,187,000	941,000	12,000	0	0	0	July
1,503,000	855,000	8,000	0	0	0	Aug.
876,000	513,000	4,000	0	0	0	Sept.
567,000	171,000	3,000	0	0	0	Oct.
614,000	0	2,000	0	0	0	Nov.
841,000	0	0	0	0	0	Dec.
	4,276,000	57,000	3,862,000	0	0	Total or average
						1906
1,090,000	0	0	0	0	0	Jan.
1,941,000	0	0	327,000	0	0	Feb.
2,486,000	43,000	0	1,579,000	0	0	Mar.
2,510,000	214,000	7,000	347,000	0	0	April
2,937,000	684,000	10,000	0	120,000	0	May
2,940,000	855,000	12,000	0	44,000	0	June
2,785,000	941,000	14,000	0	0	0	July
2,192,000	855,000	11,000	0	0	0	Aug.
1,606,000	513,000	7,000	0	0	0	Sept.
1,333,000	171,000	5,000	0	0	0	Oct.
1,408,000	0	3,000	0	0	0	Nov.
1,661,000	0	0	0	0	0	Dec.
	4,276,000	69,000	2,253,000	164,000	0	Total or average
						1907
2,309,000	0	0	759,000	0	0	Jan.
2,486,000	0	0	1,636,000	0	0	Feb.
2,486,000	43,000	0	2,072,000	0	0	Mar.
2,486,000	214,000	7,000	325,000	250,000	0	April
2,940,000	684,000	10,000	0	8 000	0	May
2,884,000	855,000	12,000	0	0	0	June
2,438,000	941,000	13,000	0	0	0	July
1,818,000	855,000	10,000	0	0	0	Aug.
1,244,000	513,000	6,000	0	0	0	Sept.
977,000	171,000	4,000	0	0	0	Oct.
1,063,000	0	3,000	0	0	0	Nov.
1,316,000	0	0	0	0	0	Dec.
	4,276,000	65,000	4,792,000	258,000	0	Total or average

TABLE 3a (Continued). KENNETT
COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1908							
Jan.	904,000	1,795,000	0	0	44,000	0	0
Feb.	970,000	2,655,000	0	0	1,073,000	0	0
Mar.	669,000	2,552,000	43,000	0	284,000	0	0
April	527,000	2,894,000	214,000	7,000	0	260,000	0
May	492,000	2,940,000	684,000	10,000	0	0	0
June	340,000	2,738,000	855,000	11,000	0	0	0
July	260,000	2,212,000	941,000	12,000	0	0	0
Aug.	229,000	1,519,000	855,000	8,000	0	0	0
Sept.	205,000	885,000	513,000	5,000	0	0	0
Oct.	235,000	572,000	171,000	3,000	0	0	0
Nov.	257,000	633,000	0	2,000	0	0	0
Dec.	267,000	888,000	0	0	0	0	0
Total or average	5,355,000		4,276,000	58,000	1,401,000	260,000	0
1909							
Jan.	3,260,000	1,155,000	0	0	1,909,000	0	0
Feb.	2,526,000	2,506,000	0	0	2,407,000	0	0
Mar.	977,000	2,625,000	43,000	0	650,000	0	0
April	756,000	2,909,000	214,000	7,000	35,000	469,000	0
May	581,000	2,940,000	684,000	10,000	0	5,000	0
June	410,000	2,822,000	855,000	11,000	0	0	0
July	308,000	2,366,000	941,000	12,000	0	0	0
Aug.	264,000	1,721,000	855,000	9,000	0	0	0
Sept.	246,000	1,121,000	513,000	5,000	0	0	0
Oct.	284,000	849,000	171,000	3,000	0	0	0
Nov.	538,000	959,000	0	2,000	0	0	0
Dec.	721,000	1,495,000	0	0	0	0	0
Total or average	10,871,000		4,276,000	59,000	5,001,000	474,000	0
1910							
Jan.	708,000	2,216,000	0	0	280,000	0	0
Feb.	847,000	2,644,000	0	0	717,000	0	0
Mar.	1,239,000	2,774,000	43,000	0	589,000	441,000	0
April	665,000	2,940,000	214,000	7,000	0	444,000	0
May	415,000	2,940,000	684,000	10,000	0	0	0
June	282,000	2,661,000	855,000	11,000	0	0	0
July	254,000	2,077,000	941,000	11,000	0	0	0
Aug.	236,000	1,379,000	855,000	8,000	0	0	0
Sept.	214,000	752,000	513,000	4,000	0	0	0
Oct.	231,000	449,000	171,000	2,000	0	0	0
Nov.	274,000	507,000	0	2,000	0	0	0
Dec.	436,000	779,000	0	0	0	0	0
Total or average	5,801,000		4,276,000	55,000	1,586,000	885,000	0
1911							
Jan.	700,000	1,215,000	0	0	0	0	0
Feb.	848,000	1,915,000	0	0	172,000	0	0
Mar.	1,278,000	2,591,000	43,000	0	1,013,000	0	0
April	962,000	2,813,000	214,000	7,000	172,000	442,000	0
May	671,000	2,940,000	684,000	10,000	0	13,000	0
June	431,000	2,904,000	855,000	12,000	0	0	0
July	287,000	2,468,000	941,000	13,000	0	0	0
Aug.	244,000	1,801,000	855,000	10,000	0	0	0
Sept.	231,000	1,180,000	513,000	6,000	0	0	0
Oct.	246,000	892,000	171,000	3,000	0	0	0
Nov.	241,000	964,000	0	2,000	0	0	0
Dec.	244,000	1,203,000	0	0	0	0	0
Total or average	6,383,000		4,276,000	63,000	1,357,000	455,000	0

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasona irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1908
1,795,000	0	0	213,000	0	0	Jan.
2,486,000	0	0	970,000	0	0	Feb.
2,486,000	43,000	0	626,000	0	0	Mar.
2,486,000	214,000	7,000	58,000	0	0	April
2,734,000	684,000	10,000	0	0	0	May
2,532,000	855,000	11,000	0	0	0	June
2,006,000	941,000	11,000	0	0	0	July
1,314,000	855,000	8,000	0	0	0	Aug.
680,000	513,000	4,000	0	0	0	Sept.
368,000	171,000	2,000	0	0	0	Oct.
430,000	0	1,000	0	0	0	Nov.
686,000	0	0	0	0	0	Dec.
	4,276,000	54,000	1,867,000	0	0	Total or average
						1909
953,000	0	0	1,727,000	0	0	Jan.
2,486,000	0	0	2,526,000	0	0	Feb.
2,486,000	43,000	0	934,000	0	0	Mar.
2,486,000	214,000	7,000	144,000	0	0	April
2,877,000	684,000	10,000	0	0	0	May
2,764,000	855,000	11,000	0	0	0	June
2,308,000	941,000	12,000	0	0	0	July
1,663,000	855,000	9,000	0	0	0	Aug.
1,063,000	513,000	5,000	0	0	0	Sept.
791,000	171,000	3,000	0	0	0	Oct.
901,000	0	2,000	0	0	0	Nov.
1,437,000	0	0	0	0	0	Dec.
	4,276,000	59,000	5,331,000	0	0	Total or average
						1910
2,158,000	0	0	380,000	0	0	Jan.
2,485,000	0	0	847,000	0	0	Feb.
2,486,000	43,000	0	1,195,000	0	0	Mar.
2,486,000	214,000	7,000	133,000	0	0	April
2,797,000	684,000	10,000	0	0	0	May
2,518,000	855,000	11,000	0	0	0	June
1,934,000	941,000	11,000	0	0	0	July
1,236,000	855,000	7,000	0	0	0	Aug.
610,000	513,000	4,000	0	0	0	Sept.
307,000	171,000	2,000	0	0	0	Oct.
365,000	0	1,000	0	0	0	Nov.
638,000	0	0	0	0	0	Dec.
	4,276,000	53,000	2,556,000	0	0	Total or average
						1911
1,074,000	0	0	0	0	0	Jan.
1,774,000	0	0	136,000	0	0	Feb.
2,486,000	43,000	0	1,235,000	0	0	Mar.
2,486,000	214,000	7,000	263,000	24,000	0	April
2,940,000	684,000	10,000	0	13,000	0	May
2,904,000	855,000	12,000	0	0	0	June
2,468,000	941,000	13,000	0	0	0	July
1,801,000	855,000	10,000	0	0	0	Aug.
1,180,000	513,000	6,000	0	0	0	Sept.
892,000	171,000	3,000	0	0	0	Oct.
964,000	0	2,000	0	0	0	Nov.
1,203,000	0	0	0	0	0	Dec.
	4,276,000	63,000	1,634,000	37,000	0	Total or average

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1912							
Jan.	517,000	1,447,000	0	0	0	0	0
Feb.	396,000	1,964,000	0	0	0	0	0
Mar.	635,000	2,360,000	43,000	0	0	12,000	0
April	487,000	2,940,000	214,000	7,000	0	266,000	0
May	714 000	2,940,000	684,000	10,000	0	58,000	0
June	405,000	2,902,000	855,000	12,000	0	0	0
July	274,000	2,440,000	941,000	13,000	0	0	0
Aug.	238,000	1,760,000	855,000	9,000	0	0	0
Sept.	242,000	1,134,000	513,000	5,000	0	0	0
Oct.	226,000	858,000	171,000	3,000	0	0	0
Nov.	432,000	910,000	0	2,000	0	0	0
Dec.	369,000	1,340,000	0		0	0	0
Total or average	4,935,000		4,276,000	61,000	0	336,000	0
1913							
Jan.	763,000	1,709,000	0	0	0	0	0
Feb.	387,000	2,472,000	0	0	135,000	0	0
Mar.	441,000	2,724,000	43,000	0	37,000	145,000	0
April	685,000	2,940,000	214,000	7,000	0	464,000	0
May	521,000	2,940,000	684,000	10,000	0	0	0
June	321,000	2,767,000	855,000	11,000	0	0	0
July	263,000	2,222,000	941,000	12,000	0	0	0
Aug.	232,000	1,532,000	855,000	8,000	0	0	0
Sept.	190,000	901,000	513,000	5 000	0	0	0
Oct.	202,000	573,000	171,000	3,000	0	0	0
Nov.	316,000	601,000	0	2,000	0	0	0
Dec.	696,000	915,000	0	0	0	0	0
Total or average	5,017,000		4,276,000	58,000	172,000	609,000	0
1914							
Jan.	2,797,000	1,611,000	0	0	1,629,000	0	0
Feb.	1,359,000	2,779,000	0	0	1,364,000	0	0
Mar.	987,000	2,774,000	43,000	0	820,000	0	0
April	1,137,000	2,898,000	214,000	7,000	30,000	844,000	0
May	703,000	2,940,000	684,000	10,000	0	37,000	0
June	452,000	2,912,000	855,000	12,000	0	0	0
July	309,000	2,497,000	941,000	13,000	0	0	0
Aug.	248,000	1,852,000	855,000	10,000	0	0	0
Sept.	225,000	1,235,000	513,000	6,000	0	0	0
Oct.	269,000	941,000	171,000	4,000	0	0	0
Nov.	252,000	1,035,000	0	3,000	0	0	0
Dec.	347,000	1,284,000	0	0	0	0	0
Total or average	9,085,000		4,276,000	65,000	3,843,000	881,000	0
1915							
Jan.	895,000	1,631,000	0	0	38,000	0	0
Feb.	2,298,000	2,488,000	0	0	2,095,000	0	0
Mar.	1,264,000	2,691,000	43,000	0	985,000	0	0
April	1,159,000	2,927,000	214,000	7,000	47,000	878,000	0
May	1,256,000	2,940,000	684,000	10,000	0	562,000	0
June	572,000	2,940,000	855,000	12,000	0	0	0
July	343,000	2,645,000	941,000	14,000	0	0	0
Aug.	266,000	2,033,000	855,000	10,000	0	0	0
Sept.	215,000	1,434,000	513,000	6,000	0	0	0
Oct.	233,000	1,130,000	171,000	4,000	0	0	0
Nov.	254,000	1,188,000	0	3,000	0	0	0
Dec.	699,000	1,439,000	0	0	0	0	0
Total or average	9,454,000		4,276,000	66,000	3,165,000	1,440,000	0

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1912
1,447,000	0	0	0	0	0	Jan.
1,964,000	0	0	0	0	0	Feb.
2,360,000	43,000	0	466,000	0	0	Mar.
2,486,000	214,000	7,000	45,000	0	0	April
2,707,000	684,000	10,000	0	0	0	May
2,727,000	855,000	11,000	0	0	0	June
2,266,000	941,000	12,000	0	0	0	July
1,587,000	855,000	9,000	0	0	0	Aug.
961,000	513,000	5,000	0	0	0	Sept.
685,000	171,000	3,000	0	0	0	Oct.
737,000	0	2,000	0	0	0	Nov.
1,167,000	0	0	0	0	0	Dec.
	4,275,000	59,000	511,000	0	0	Total or average
						1913
1,536,000	0	0	0	0	0	Jan.
2,299,000	0	0	200,000	0	0	Feb.
2,486,000	43,000	0	398,000	0	0	Mar.
2,486,000	214,000	7,000	136,000	0	0	April
2,814,000	684,000	10,000	0	0	0	May
2,641,000	855,000	11,000	0	0	0	June
2,096,000	941,000	11,000	0	0	0	July
1,407,000	855,000	8,000	0	0	0	Aug.
776,000	513,000	4,000	0	0	0	Sept.
449,000	171,000	2,000	0	0	0	Oct.
478,000	0	2,000	0	0	0	Nov.
792,000	0	0	0	0	0	Dec.
	4,276,000	55,000	734,000	0	0	Total or average
						1914
1,488,000	0	0	1,799,000	0	0	Jan.
2,486,000	0	0	1,359,000	0	0	Feb.
2,486,000	43,000	0	944,000	0	0	Mar.
2,486,000	214,000	7,000	235,000	227,000	0	April
2,940,000	684,000	10,000	0	37,000	0	May
2,912,000	855,000	12,000	0	0	0	June
2,497,000	941,000	13,000	0	0	0	July
1,852,000	855,000	10,000	0	0	0	Aug.
1,235,000	513,000	6,000	0	0	0	Sept.
941,000	171,000	4,000	0	0	0	Oct.
1,035,000	0	3,000	0	0	0	Nov.
1,284,000	0	0	0	0	0	Dec.
	4,276,000	65,000	4,337,000	264,000	0	Total or average
						1915
1,631,000	0	0	40,000	0	0	Jan.
2,486,000	0	0	2,298,000	0	0	Feb.
2,486,000	43,000	0	1,221,000	0	0	Mar.
2,486,000	214,000	7,000	335,000	149,000	0	April
2,940,000	684,000	10,000	0	562,000	0	May
2,940,000	855,000	12,000	0	0	0	June
2,645,000	941,000	14,000	0	0	0	July
2,033,000	855,000	10,000	0	0	0	Aug.
1,434,000	513,000	6,000	0	0	0	Sept.
1,130,000	171,000	4,000	0	0	0	Oct.
1,188,000	0	3,000	0	0	0	Nov.
1,439,000	0	0	0	0	0	Dec.
	4,276,000	66,000	3,894,000	711,000	0	Total or average

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1916							
Jan.	1,166,000	2,138,000	0	0	812,000	0	0
Feb.	1,616,000	2,492,000	0	0	1 566,000	0	0
Mar.	1,215,000	2,542,000	43,000	0	836,000	0	0
April	678,000	2,878,000	214,000	7,000	9,000	386,000	0
May	485,000	2,940,000	684,000	10,000	0	0	0
June	353,000	2,731,000	855,000	11,000	0	0	0
July	316,000	2,218,000	941,000	12,000	0	0	0
Aug.	244,000	1,581,000	855,000	9,000	0	0	0
Sept.	213,000	961,000	513,000	5,000	0	0	0
Oct.	236,000	656,000	171,000	3,000	0	0	0
Nov.	242,000	718,000	0	2,000	0	0	0
Dec.	363,000	958,000	0	0	0	0	0
Total or average	7,127,000		4,276,000	59,000	3,223,000	386.000	0
1917							
Jan.	312,000	1,321,000	0	0	0	0	0
Feb.	760,000	1,633,000	0	0	0	0	0
Mar.	459,000	2,393,000	43,000	0	0	0	0
April	906,000	2,809,000	214,000	7,000	0	554,000	0
May	580,000	2,940,000	684,000	10,000	0	5,000	0
June	329,000	2,821,000	855,000	11,000	0	0	0
July	238,000	2,284,000	941,000	12,000	0	0	0
Aug.	214,000	1,569,000	855,000	9,000	0	0	0
Sept.	185,000	919,000	513,000	5,000	0	0	0
Oct.	200,000	586,000	171,000	3,000	0	0	0
Nov.	224,000	612,000	0	2,000	0	0	0
Dec.	298,000	834,000	0	0	0	0	0
Total or average	4,705,000		4,276,000	59,000	0	559,000	0
1918							
Jan.	249,000	1,132,000	0	0	0	0	0
Feb.	399,000	1,381,000	0	0	0	0	0
Mar.	772,000	1,780,000	43,000	0	0	0	0
April	556,000	2,509,000	214,000	7,000	0	0	0
May	314,000	2,844,000	684,000	10,000	0	0	0
June	232,000	2,464,000	855,000	11,000	0	0	0
July	200,000	1,830,000	941,000	10,000	0	0	0
Aug.	192,000	1,079,000	855,000	7,000	0	0	0
Sept.	186,000	409,000	513,000	3,000	0	0	0
Oct.	258,000	79,000	171,000	1,000	0	0	0
Nov.	246,000	165,000	0	1,000	0	0	0
Dec.	258,000	410,000	0	0	0	0	0
Total or average	3,862,000		4,276,000	50,000	0	0	0
1919							
Jan.	587,000	668,000	0	0	0	0	0
Feb.	1,163,000	1,255,000	0	0	0	0	0
Mar.	959,000	2,418,000	43,000	0	509,000	0	0
April	752,000	2,825,000	214,000	7,000	82,000	334,000	0
May	438,000	2,940,000	684,000	10,000	0	0	0
June	252,000	2,684,000	855,000	11,000	0	0	0
July	219,000	2,070,000	941,000	11,000	0	0	0
Aug.	199,000	1,337,000	855,000	8,000	0	0	0
Sept.	168,000	673,000	513,000	4,000	0	0	0
Oct.	203,000	324,000	171,000	2,000	0	0	0
Nov.	186,000	354,000	0	1,000	0	0	0
Dec.	180.000	539,000	0	0	0	0	0
Total or average	5,306,000		4,276,000	54,000	591,000	334,000	0

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1900							
Jan.	1,299,000	1,372,000	0	0	181,000	0	0
Feb.	391,000	2,490,000	0	0	302,000	0	0
Mar.	912,000	2,579,000	43,000	0	570,000	0	0
April	457,000	2,878,000	214,000	7,000	0	174,000	0
May	413,000	2,940,000	684,000	10,000	0	0	0
June	247,000	2,659,000	855,000	11,000	0	0	0
July	219,000	2,040,000	941,000	11,000	0	0	0
Aug.	208,000	1,307,000	855,000	8,000	0	0	0
Sept.	201,000	652,000	513,000	4,000	0	0	0
Oct.	308,000	336,000	171,000	2,000	0	0	0
Nov.	368,000	471,000	0	2,000	0	0	0
Dec.	697,000	837,000	0	0	0	0	0
Total or average	5,720,000		4,276,000	55,000	1,053,000	174,000	0
1901							
Jan.	895,000	1,534,000	0	0	0	0	0
Feb.	1,304,000	2,429,000	0	0	1,192,000	0	0
Mar.	749,000	2,541,000	43,000	0	443,000	0	0
April	382,000	2,804,000	214,000	7,000	0	25,000	0
May	411,000	2,940,000	684,000	10,000	0	0	0
June	240,000	2,657,000	855,000	11,000	0	0	0
July	218,000	2,031,000	941,000	11,000	0	0	0
Aug.	206,000	1,297,000	855,000	8,000	0	0	0
Sept.	200,000	640,000	513,000	4,000	0	0	0
Oct.	215,000	323,000	171,000	2,000	0	0	0
Nov.	354,000	365,000	0	1,000	0	0	0
Dec.	550,000	718,000	0	0	0	0	0
Total or average	5,724,000		4,276,000	54,000	1,635,000	25,000	0
1902							
Jan.	227,000	1,268,000	0	0	0	0	0
Feb.	2,782,000	1,495,000	0	0	1,711,000	0	0
Mar.	1,115,000	2,566,000	43,000	0	796,000	0	0
April	891,000	2,842,000	214,000	7,000	0	572,000	0
May	765,000	2,940,000	684,000	10,000	0	105,000	0
June	407,000	2,906,000	855,000	12,000	0	0	0
July	254,000	2,446,000	941,000	13,000	0	0	0
Aug.	234,000	1,746,000	855,000	9,000	0	0	0
Sept.	184,000	1,116,000	513,000	5,000	0	0	0
Oct.	235,000	782,000	171,000	3,000	0	0	0
Nov.	829,000	843,000	0	2,000	0	0	0
Dec.	762,000	1,670,000	0	0	0	0	0
Total or average	8,685,000		4,276,000	61,000	2,507,000	677,000	0
1903							
Jan.	1,113,000	2,432,000	0	0	1,056,000	0	0
Feb.	633,000	2,489,000	0	0	574,000	0	0
Mar.	1,339,000	2,548,000	43,000	0	1,032,000	0	0
April	765,000	2,812,000	214,000	7,000	111,000	305,000	0
May	458,000	2,940,000	684,000	10,000	0	0	0
June	278,000	2,704,000	855,000	11,000	0	0	0
July	231,000	2,116,000	941,000	11,000	0	0	0
Aug.	204,000	1,395,000	855,000	8,000	0	0	0
Sept.	174,000	736,000	513,000	4,000	0	0	0
Oct.	199,000	393,000	171,000	2,000	0	0	0
Nov.	924,000	419,000	0	1,000	0	0	0
Dec.	530,000	1,342,000	0	0	0	0	0
Total or average	6,848,000		4,276,000	54,000	2,773,000	305,000	0

TABLE 3a (Continued). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1920							
Jan.	207,000	719,000	0	0	0	0	0
Feb.	176,000	926,000	0	0	0	0	0
Mar.	372,000	1,102,000	43,000	0	0	0	0
April	493,000	1,431,000	214,000	5,000	0	0	0
May	286,000	1,705,000	684,000	7,000	0	0	0
June	216,000	1,300,000	855,000	7,000	0	0	0
July	192,000	654,000	841,000	5,000	0	0	100,000
Aug.	176,000	0	176,000	0	0	0	679,000
Sept.	140,000	0	140,000	0	0	0	373,000
Oct.	180,000	0	168,000	0	0	0	3,000
Nov.	896,000	12,000	0	0	0	0	0
Dec.	1,121,000	908,000	0	0	0	0	0
Total or average	4,455,000		3,121,000	24,000	0	0	1,155,000
1921							
Jan.	1,492,000	2,029,000	0	0	868,000	0	0
Feb.	1,035,000	2,653,000	0	0	1,126,000	0	0
Mar.	982,000	2,562,000	43,000	0	679,000	0	0
April	559,000	2,822,000	214,000	7,000	9,000	211,000	0
May	493,000	2,940,000	684,000	10,000	0	0	0
June	316,000	2,739,000	855,000	11,000	0	0	0
July	220,000	2,189,000	941,000	12,000	0	0	0
Aug.	192,000	1,456,000	855,000	8,000	0	0	0
Sept.	175,000	785,000	513,000	4,000	0	0	0
Oct.	196,000	443,000	171,000	2,000	0	0	0
Nov.	205,000	466,000	0	2,000	0	0	0
Dec.	390,000	669,000	0	0	0	0	0
Total or average	6,255,000		4,276,000	56,000	2,682,000	211,000	0
1922							
Jan.	300,000	1,059,000	0	0	0	0	0
Feb.	679,000	1,359,000	0	0	0	0	0
Mar.	567,000	2,038,000	43,000	0	0	0	0
April	604,000	2,562,000	214,000	7,000	0	5,000	0
May	577,000	2,940,000	684,000	10,000	0	0	0
June	317,000	2,823,000	855,000	11,000	0	0	0
July	203,000	2,274,000	941,000	12,000	0	0	0
Aug.	182,000	1,524,000	855,000	8,000	0	0	0
Sept.	161,000	843,000	513,000	4,000	0	0	0
Oct.	208,000	487,000	171,000	2,000	0	0	0
Nov.	244,000	522,000	0	2,000	0	0	0
Dec.	462,000	764,000	0	0	0	0	0
Total or average	4,504,000		4,276,000	56,000	0	5,000	0
1923							
Jan.	467,000	1,226,000	0	0	0	0	0
Feb.	297,000	1,693,000	0	0	0	0	0
Mar.	287,000	1,990,000	43,000	0	0	0	0
April	632,000	2,234,000	214,000	6,000	0	0	0
May	322,000	2,646,000	684,000	10,000	0	0	0
June	236,000	2,274,000	855,000	10,000	0	0	0
July	184,000	1,645,000	941,000	10,000	0	0	0
Aug.	165,000	878,000	855,000	6,000	0	0	0
Sept.	157,000	182,000	338,000	1,000	0	0	175,000
Oct.	187,000	0	171,000	0	0	0	0
Nov.	176,000	16,000	0	0	0	0	0
Dec.	184,000	192,000	0	0	0	0	0
Total or average	3,294,000		4,101,000	43,000	0	0	175,000

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1920
622,000	0	0	0	0	0	Jan.
829,000	0	0	0	0	0	Feb.
1,005,000	43,000	0	0	0	0	Mar.
1,334,000	214,000	4,000	0	0	0	April
1,609,000	684,000	7,000	0	0	0	May
1,204,000	855,000	6,000	0	0	0	June
559,000	746,000	5,000	0	0	195,000	July
0	176,000	0	0	0	679,000	Aug.
0	140,000	0	0	0	373,000	Sept.
0	168,000	0	0	0	3,000	Oct.
12,000	0	0	0	0	0	Nov.
908,000	0	0	0	0	0	Dec.
	3,026,000	22,000	0	0	1,250,000	Total or average
						1921
2,029,000	0	0	1,035,000	0	0	Jan.
2,486,000	0	0	1,035,000	0	0	Feb.
2,486,000	43,000	0	939,000	0	0	Mar.
2,486,000	214,000	7,000	110,000	0	0	April
2,714,000	684,000	10,000	0	0	0	May
2,513,000	855,000	11,000	0	0	0	June
1,963,000	941,000	11,000	0	0	0	July
1,231,000	855,000	7,000	0	0	0	Aug.
561,000	513,000	3,000	0	0	0	Sept.
220,000	171,000	1,000	0	0	0	Oct.
244,000	0	1,000	0			Nov.
448,000	0	0	0	0	0	Dec.
	4,276,000	51,000	3,119,000	0	0	Total or average
						1922
838,000	0	0	0	0	0	Jan.
1,138,000	0	0	0	0	0	Feb.
1,817,000	43,000	0	0	0	0	Mar.
2,341,000	214,000	6,000	2,000	0	0	April
2,723,000	684,000	10,000	0	0	0	May
2,606,000	855,000	11,000	0	0	0	June
2,057,000	941,000	11,000	0	0	0	July
1,308,000	855,000	8,000	0	0	0	Aug.
627,000	513,000	4,000	0	0	0	Sept.
271,000	171,000	2,000	0	0	0	Oct.
306,000	0	1,000	0	0	0	Nov.
549,000	0	0	0	0	0	Dec.
	4,276,000	53,000	2,000	0	0	Total or average
						1923
1,011,000	0	0	0	0	0	Jan.
1,478,000	0	0	0	0	0	Feb.
1,775,000	43,000	0	0	0	0	Mar.
2,019,000	214,000	6,000	0	0	0	April
2,431,000	684,000	9,000	0	0	0	May
2,060,000	855,000	9,000	0	0	0	June
1,432,000	941,000	9,000	0	0	0	July
666,000	826,000	5,000	0	0	29,000	Aug.
0	157,000	0	0	0	356,000	Sept.
0	171,000	0	0	0	0	Oct.
16,000	0	0	0	0	0	Nov.
192,000	0	0	0	0	0	Dec.
	3,891,000	38,000	0	0	385,000	Total or average

TABLE 3a (Concluded). KENNETT

COMPARISON OF WATER YIELD
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.					
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet
1924							
Jan.	203,000	376,000	0	0	0	0	0
Feb.	332,000	579,000	0	0	0	0	0
Mar.	200,000	911,000	43,000	0	0	0	0
April	176,000	1,068,000	214,000	4,000	0	0	0
May	155,000	1,026,000	684,000	5,000	0	0	0
June	141,000	492,000	629,000	4,000	0	0	226,000
July	140,000	0	140,000	0	0	0	801,000
Aug.	140,000	0	140,000	0	0	0	715,000
Sept.	128,000	0	128,000	0	0	0	385,000
Oct.	178,000	0	158,000	0	0	0	13,000
Nov.	317,000	20,000	0	0	0	0	0
Dec.	321,000	337,000	0	0	0	0	0
Total or average	2,431,000		2,136,000	13,000	0	0	2,140,000
1925							
Jan.	301,000	658,000	0	0	0	0	0
Feb.	1,769,000	959,000	0	0	200,000	0	0
Mar.	563,000	2,528,000	43,000	0	232,000	0	0
April	926,000	2,816,000	214,000	7,000	94,000	487,000	0
May	474,000	2,940,000	684,000	10,000	0	0	0
June	276,000	2,720,000	855,000	11,000	0	0	0
July	173,000	2,130,000	941,000	11,000	0	0	0
Aug.	167,000	1,351,000	855,000	8,000	0	0	0
Sept.	163,000	655,000	513,000	4,000	0	0	0
Oct.	181,000	301,000	171,000	2,000	0	0	0
Nov.	192,000	309,000	0	1,000	0	0	0
Dec.	235,000	500,000	0	0	0	0	0
Total or average	5,420,000		4,276,000	54,000	526,000	487,000	0
Total for 30-year period, 1896-1926	**188,012,000**		**124,570,000**	**1,641,000**	**49,509,000**	**13,417,000**	**3,710,000**
Average for 30-year period, 1896-1926	**6,267,000**		**4,152,000**	**55,000**	**1,650,000**	**447,000**	**124,000**

RESERVOIR ON SACRAMENTO RIVER.

OPERATING PRIMARILY FOR IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 3, page 112.)

Seasonal irrigation yield (deficiency in supply one year in ten, no deduction for downstream prior rights) 4,276,000 acre-feet.

Flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Year and month
						1924
376,000	0	0	0	0	0	Jan.
579,000	0	0	0	0	0	Feb.
911,000	43,000	0	0	0	0	Mar.
1,068,000	214,000	4,000	0	0	0	April
1,026,000	684,000	5,000	0	0	0	May
492,000	629,000	4,000	0	0	226,000	June
0	140,000	0	0	0	801,000	July
0	140,000	0	0	0	715,000	Aug.
0	128,000	0	0	0	385,000	Sept.
0	158,000	0	0	0	13,000	Oct.
20,000	0	0	0	0	0	Nov.
337,000	0	0	0	0	0	Dec.
	2,136,000	13,000	0	0	2,140,000	Total or average
						1925
658,000	0	0	0	0	0	Jan.
959,000	0	0	242,000	0	0	Feb.
2,486,000	43,000	0	520,000	0	0	Mar.
2,486,000	214,000	7,000	197,000	54,000	0	April
2,940,000	684,000	10,000	0	0	0	May
2,720,000	855,000	11,000	0	0	0	June
2,130,000	941,000	11,000	0	0	0	July
1,351,000	855,000	8,000	0	0	0	Aug.
655,000	513,000	4,000	0	0	0	Sept.
301,000	171,000	2,000	0	0	0	Oct.
309,000	0	1,000	0	0	0	Nov.
500,000	0	0	0	0	0	Dec.
	4,276,000	54,000	959,000	54,000	0	Total or average
	124,224,000	**1,582,000**	**60,257,000**	**3,074,000**	**4,056,000**	**Total for 30-year period, 1896-1926**
	4,141,000	**53,000**	**2,009,000**	**102,000**	**135,000**	**Average for 30-year period, 1896-1926**

TABLE 4a. KENNETT RESER

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1896											
Jan.	1,980,000	2,256,000	242,000	118,000	0	1,367,000	0	383	97,400	47,200	144,600
Feb.	474,000	2,509,000	231,000	51,000	0	50,000	0	396	98,400	22,300	120,700
Mar.	738,000	2,651,000	247,000	49,000	0	0	153,000	405	104,200	20,400	124,600
April	891,000	2,940,000	249,000	231,000	7,000	0	404,000	408	109,000	101,000	210,000
May	1,194,000	2,940,000	279,000	219,000	10,000	0	686,000	407	117,500	92,500	210,000
June	536,000	2,940,000	283,000	196,000	12,000	0	80,000	410	124,200	85,800	210,000
July	313,000	2,905,000	238,000	151,000	14,000	0	0	407	125,400	63,700	189,100
Aug.	268,000	2,755,000	304,000	102,000	13,000	0	0	400	126,700	42,500	169,200
Sept.	258,000	2,604,000	282,000	101,000	10,000	0	0	394	120,000	42,800	162,800
Oct.	262,000	2,469,000	278,000	75,000	7,000	0	0	388	113,400	30,500	143,900
Nov.	472,000	2,371,000	264,000	161,000	5,000	0	0	385	110,300	66,800	177,100
Dec.	920,000	2,413,000	268,000	247,000	0	223,000	0	390	109,400	100,600	210,000
Total or average	8,306,000		3,225,000	1,701,000	78,000	1,640,000	1,323,000	398	113,000	59,700	172,700
1897											
Jan.	577,000	2,595,000	238,000	174,000	0	252,000	0	392	97,400	71,000	168,400
Feb.	1,338,000	2,508,000	228,000	242,000	0	846,000	0	385	101,900	108,100	210,000
Mar.	737,000	2,530,000	251,000	130,000	0	75,000	0	398	104,200	53,200	157,400
April	858,000	2,811,000	249,000	186,000	7,000	2,000	285,000	408	109,000	81,400	190,400
May	554,000	2,940,000	276,000	195,000	10,000	0	73,000	411	117,500	82,500	200,000
June	310,000	2,940,000	283,000	73,000	12,000	0	0	410	124,200	32,100	156,300
July	275,000	2,882,000	298,000	90,000	14,000	0	0	407	125,400	37,900	163,300
Aug.	254,000	2,755,000	505,000	87,000	13,000	0	0	400	126,700	36,200	162,900
Sept.	247,000	2,604,000	282,000	90,000	10,000	0	0	394	120,000	38,200	158,200
Oct.	262,000	2,469,000	278,000	75,000	7,000	0	0	388	113,400	30,500	143,900
Nov.	274,000	2,371,000	265,000	97,000	5,000	0	0	382	110,300	40,300	150,600
Dec.	366,000	2,278,000	274,000	113,000	0	0	0	380	109,400	45,200	154,600
Total or average	6,052,000		3,227,000	1,552,000	78,000	1,175,000	358,000	396	113,400	54,300	167,700
1898											
Jan.	257,000	2,257,000	243,000	0	0	0	0	380	97,400	0	97,400
Feb.	478,000	2,271,000	226,000	0	0	0	0	388	101,900	0	101,900
Mar.	380,000	2,523,000	248,000	0	0	0	0	397	104,200	0	104,200
April	274,000	2,655,000	253,000	0	7,000	0	0	400	109,000	0	109,000
May	300,000	2,669,000	281,000	0	10,000	0	0	401	117,500	0	117,500
June	304,000	2,678,000	287,000	0	11,000	0	0	401	124,200	0	124,200
July	237,000	2,684,000	301,000	0	14,000	0	0	400	125,400	0	125,400
Aug.	225,000	2,606,000	307,000	0	12,000	0	0	396	126,700	0	126,700
Sept.	198,000	2,512,000	284,000	0	9,000	0	0	390	120,000	0	120,000
Oct.	221,000	2,417,000	279,000	0	7,000	0	0	386	113,400	0	113,400
Nov.	217,000	2,352,000	265,000	21,000	5,000	0	0	383	110,300	8,800	119,100
Dec.	217,000	2,278,000	274,000	0	0	0	0	380	109,400	0	109,400
Total or average	3,308,000		3,248,000	21,000	75,000	0	0	392	113,400	700	114,100

*Total primary power production in February of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1896
2,075,000	238,000	132,000	0	1,199,000	0	374	94,100	52,300	146,400	Jan.
2,486,000	226,000	182,000	0	66,000	0	390	95,100	79,300	174,400	Feb.
2,486,000	246,000	225,000	0	267,000	0	389	100,500	91,400	191,900	Mar.
2,486,000	245,000	115,000	7,000	70,000	0	398	105,300	49,000	154,300	April
2,940,000	268,000	228,000	10,000	0	688,000	408	113,300	96,700	210,000	May
2,940,000	274,000	205,000	12,000	0	80,000	411	119,700	90,300	210,000	June
2,905,000	287,000	212,000	14,000	0	0	407	121,100	88,900	210,000	July
2,705,000	296,000	198,000	13,000	0	0	395	122,300	81,600	203,900	Aug.
2,466,000	277,000	100,000	9,000	0	0	386	115,800	41,800	157,600	Sept.
2,338,000	272,000	75,000	7,000	0	0	382	109,500	30,100	139,600	Oct.
2,246,000	258,600	170,000	4,000	0	0	378	106,500	69,700	176,200	Nov.
2,286,000	262,000	260,000	0	198,000	0	383	105,600	104,400	210,000	Dec.
	3,149,000	2,102,000	76,000	1,800,000	768,000	392	109,100	73,000	182,100	Total or average
										1897
2,486,000	230,000	205,000	0	142,000	0	390	94,100	83,300	177,400	Jan.
2,486,000	229,000	250,000	0	868,000	0	384	98,500	111,500	210,000	Feb.
2,486,000	247,000	264,000	0	226,000	0	388	100,500	107,000	207,500	Mar.
2,486,000	245,000	156,000	7,000	70,000	0	398	105,300	66,500	171,800	April
2,866,000	267,000	228,000	10,000	0	0	410	113,300	96,700	210,000	May
2,915,000	275,000	208,000	12,000	0	0	406	119,700	90,300	210,000	June
2,730,000	291,000	90,000	14,000	0	0	400	121,100	37,600	158,700	July
2,610,000	298,000	88,000	12,000	0	0	394	122,300	36,200	158,500	Aug.
2,466,000	277,000	89,000	9,000	0	0	386	115,800	37,200	153,000	Sept.
2,338,000	272,000	75,000	7,000	0	0	382	109,500	30,100	139,600	Oct.
2,246,000	259,000	98,000	4,000	0	0	377	106,500	40,300	146,800	Nov.
2,159,000	268,000	182,000	0	0	0	372	105,600	71,500	177,100	Dec.
	3,149,000	1,933,000	75,000	1,306,000	0	391	109,400	67,100	176,500	Total or average
										1898
2,075,000	240,000	0	0	0	0	370	94,100	0	94,100	Jan.
2,092,000	224,000	0	0	0	0	378	98,500	0	98,500	Feb
2,346,000	245,000	0	0	0	0	391	109,500	0	109,500	Mar.
2,481,000	247,000	0	7,000	0	0	394	105,300	0	105,300	April
2,501,000	276,000	0	9,000	0	0	394	113,300	0	113,300	May
2,516,000	282,000	0	11,000	0	0	394	119,700	0	119,700	June
2,527,000	296,900	0	13,000	0	0	392	121,100	0	121,100	July
2,455,000	301,000	0	12,000	0	0	388	122,300	0	122,300	Aug.
2,367,000	278,000	0	9,000	0	0	384	115,800	0	115,800	Sept.
2,278,000	274,000	0	7,000	0	0	380	109,500	0	109,500	Oct.
2,218,000	259,000	13,000	4,000	0	0	376	106,500	5,300	111,800	Nov.
2,159,000	268,000	33,000	0	0	0	372	105,600	13,000	118,600	Dec.
	3,190,000	46,000	72,000	0	0	384	109,400	1,500	110,900	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir a beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1899											
Jan.	605,000	2,221,000	241,000	45,000	0	2,000	0	387	97,400	18,400	115,800
Feb.	253,000	2,538,000	223,000	0	0	0	0	396	101,900	0	101,900
Mar.	900,000	2,568,000	249,000	57,000	0	278,000	0	399	104,200	23,900	128,100
April	456,000	2,884,000	246,000	140,000	7,000	0	7,000	412	109,000	61,500	170,500
May	330,000	2,940,000	276,000	44,000	10,000	0	0	412	117,500	18,800	136,300
June	302,000	2,940,000	282,000	59,000	12,000	0	7,000	411	124,200	25,700	149,900
July	240,000	2,882,000	298,000	55,000	14,000	0	0	407	125,400	23,100	148,500
Aug.	224,000	2,755,000	304,000	58,000	13,000	0	0	400	126,700	24,200	150,900
Sept.	197,000	2,604,000	282,000	40,000	10,000	0	0	394	120,000	16,900	136,900
Oct.	252,000	2,469,000	278,000	65,000	7,000	0	0	388	113,400	26,500	139,900
Nov.	645,000	2,371,000	264,000	187,000	5,000	0	0	386	110,300	77,900	188,200
Dec.	646,000	2,560,000	266,000	244,000	0	108,000	0	396	109,400	100,600	210,000
Total or average	5,050,000		3,209,000	994,000	78,000	388,000	14,000	399	113,400	35,000	148,400
1900											
Jan.	1,299,000	2,588,000	240,000	274,000	0	883,000	0	388	97,400	110,900	208,300
Feb.	391,000	2,490,000	224,000	49,000	0	29,000	0	394	101,900	22,000	123,900
Mar.	912,000	2,579,000	250,000	107,000	0	316,000	0	400	104,200	43,800	148,000
April	457,000	2,818,000	247,000	77,000	7,000	0	4,000	411	109,000	33,900	142,900
May	413,000	2,940,000	276,000	110,000	10,000	0	17,000	412	117,500	46,600	164,100
June	247,000	2,940,000	282,000	11,000	12,000	0	0	412	124,200	4,900	129,100
July	219,000	2,882,000	297,000	35,000	14,000	0	0	408	125,400	14,800	140,200
Aug.	208,000	2,755,000	303,000	43,000	13,000	0	0	402	126,700	17,900	144,600
Sept.	201,000	2,604,000	282,000	44,000	10,000	0	0	394	120,000	18,800	138,800
Oct.	308,000	2,469,000	278,000	121,000	7,000	0	0	388	113,400	49,200	162,600
Nov.	368,000	2,371,000	264,000	145,000	5,000	0	0	384	110,300	59,700	170,000
Dec.	697,000	2,325,000	271,000	222,000	0	0	0	384	109,400	89,000	198,400
Total or average	5,720,000		3,214,000	1,238,000	78,000	1,228,000	21,000	398	113,400	42,900	156,300
1901											
Jan.	895,000	2,529,000	239,000	251,000	0	446,000	0	389	97,400	101,600	199,000
Feb.	1,304,000	2,488,000	227,000	223,000	0	801,000	0	386	101,900	99,400	201,300
Mar.	749,000	2,541,000	251,000	128,000	0	155,000	0	398	104,200	52,400	156,600
April	382,000	2,756,000	249,000	0	7,000	0	0	408	109,000	0	109,000
May	411,000	2,882,000	276,000	67,000	10,000	0	0	412	117,500	28,500	146,000
June	240,000	2,940,000	282,000	4,000	12,000	0	0	412	124,200	1,800	126,000
July	218,000	2,882,000	297,000	34,000	14,000	0	0	408	125,400	14,200	139,600
Aug.	206,000	2,755,000	303,000	41,000	13,000	0	0	402	126,700	17,100	143,800
Sept.	200,000	2,604,000	282,000	43,000	10,000	0	0	394	120,000	18,200	138,200
Oct.	215,000	2,469,000	278,000	28,000	7,000	0	0	388	113,400	11,400	124,800
Nov.	354,000	2,371,000	265,000	103,000	5,000	0	0	383	110,300	42,500	152,800
Dec.	550,000	2,352,000	272,000	252,000	0	0	0	383	109,400	100,600	210,000
Total or average	5,724,000		3,221,000	1,174,000	78,000	1,462,000	0	397	113,400	40,400	153,800
1902											
Jan.	227,000	2,378,000	240,000	0	0	0	0	386	97,400	0	97,400
Feb.	2,782,000	2,365,000	230,000	176,000	0	2,175,000	0	381	101,900	77,100	179,000
Mar.	1,115,000	2,566,000	251,000	183,000	0	409,000	0	398	104,200	75,300	179,500
April	891,000	2,838,000	249,000	187,000	7,000	0	346,000	408	109,000	81,500	190,500
May	765,000	2,940,000	278,000	216,000	10,000	0	261,000	409	117,500	91,400	208,900
June	407,000	2,940,000	282,000	164,000	12,000	0	7,000	410	124,200	71,700	195,900
July	254,000	2,882,000	298,000	69,000	14,000	0	0	406	125,400	29,000	154,400
Aug.	234,000	2,755,000	304,000	68,000	13,000	0	0	400	126,700	28,400	155,100
Sept.	184,000	2,604,000	282,000	27,000	10,000	0	0	394	120,000	11,400	131,400
Oct.	235,000	2,469,000	278,000	48,000	7,000	0	0	388	113,400	19,500	132,900
Nov.	829,000	2,371,000	258,000	190,000	5,000	0	0	396	110,300	81,100	191,400
Dec.	762,000	2,747,000	264,000	241,000	0	352,000	0	400	109,400	100,600	210,000
Total or average	8,685,000		3,214,000	1,569,000	78,000	2,936,000	614,000	398	113,400	55,300	168,700

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1899
2,075,000	235,000	0	0	0	0	380	94,100	0	94,100	Jan.
2,445,000	217,000	0	0	0	0	392	98,500	0	98,500	Feb.
2,481,000	247,000	212,000	0	436,000	0	388	100,500	85,900	186,400	Mar.
2,486,000	247,000	59,000	7,000	19,000	0	393	105,300	24,400	129,700	April
2,610,000	272,000	0	9,000	0	0	399	113,300	0	113,300	May
2,659,000	278,000	0	11,000	0	0	400	119,700	0	119,700	June
2,672,000	291,000	0	14,000	0	0	400	121,100	0	121,100	July
2,607,000	296,000	57,000	12,000	0	0	394	122,300	23,400	145,700	Aug.
2,466,000	276,000	40,000	9,000	0	0	388	115,800	16,800	132,600	Sept.
2,338,000	272,000	65,000	7,000	0	0	382	109,500	26,100	135,600	Oct.
2,246,000	258,000	197,000	4,000	0	0	379	106,500	80,700	187,200	Nov.
2,432,000	260,000	257,000	0	86,000	0	388	105,600	104,400	210,000	Dec.
	3,149,000	887,000	73,000	541 000	0	390	109,400	30,400	139,800	Total or average
										1900
2,475,000	230,000	277,000	0	781,000	0	391	94,100	112,900	207,000	Jan.
2,486,000	217,000	144,000	0	30,000	0	391	98,500	64,900	163,400	Feb.
2,486,000	247,000	257,000	0	408,000	0	388	100,500	104,200	204,700	Mar.
2,486,000	247,000	49,000	7,000	3,000	0	395	105,300	20,700	126,000	April
2,637,000	271,000	0	10,000	0	0	403	113,300	0	113,300	May
2,769,000	275,000	0	11,000	0	0	404	119,700	0	119,700	June
2,730,000	290,000	35,000	14,000	0	0	401	121,100	14,700	135,800	July
2,610,000	296,000	44,000	12,000	0	0	394	122,300	18,100	140,400	Aug.
2,466,000	276,000	44,000	9,000	0	0	388	115,800	18,500	134,300	Sept.
2,338,000	272,000	121,000	7,000	0	0	382	109,500	48,500	158,000	Oct.
2,246,000	259,000	151,000	4,000	0	0	377	106,500	61,900	168,400	Nov.
2,200,000	266,000	251,000	0	0	0	377	105,600	99,200	204,800	Dec.
	3,146,000	1,373,000	74,000	1,222,000	0	391	109,400	47,100	156,500	Total or average
										1901
2,380,000	232,000	287,000	0	270,000	0	387	94,100	115,900	210,000	Jan.
2,486,000	220,000	239,000	0	845,000	0	385	98,500	106,800	205,300	Feb.
2,486,000	247,000	261,000	0	241000	0	388	100,500	106,000	206,500	Mar.
2,486,000	248,000	36,000	7,000	0	0	393	105,300	15,400	120,700	April
2,577,000	273,000	0	9,000	0	0	400	113,300	0	113,300	May
2,706,000	278,000	0	11,000	0	0	401	119,700	0	119,700	June
2,657,000	292,000	0	14,000	0	0	398	121,100	0	121,100	July
2,569,000	298,000	0	12,000	0	0	394	122,300	0	122,300	Aug.
2,465,000	269,000	49,000	9,000	0	0	388	115,800	20,600	136,400	Sept.
2,338,000	272,000	28,000	7,000	0	0	382	109,500	11,300	120,800	Oct.
2,246,000	259,000	106,000	4,000	0	0	377	106,500	43,300	149,800	Nov.
2,231,000	266,000	264,000	0	0	0	377	105,600	104,400	210,000	Dec.
	3,154,000	1,270,000	73,000	1,356,000	0	389	109,400	43,400	152,800	Total or average
										1902
2,251,000	236,000	0	0	0	0	379	94,100	0	94,100	Jan.
2,242,000	223,000	183,000	0	2,132,000	0	378	98,500	79,800	178,300	Feb.
2,486,000	248,000	272,000	0	595,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	245,000	171,000	7,000	95,000	0	399	105,300	73,500	178,800	April
2,859,000	267,000	229,000	10,000	0	178,000	409	113,300	96,700	210,000	May
2,940,000	273,000	207,000	12,000	0	7,000	410	119,700	90,300	210,000	June
2,848,000	290,000	188,000	14,000	0	0	402	121,100	78,800	199,900	July
2,610,000	298,000	68,000	12,000	0	0	392	122,300	27,800	150,100	Aug.
2,466,000	276,000	27,000	9,000	0	0	387	115,800	11,400	127,200	Sept.
2,338,000	272,000	48,000	7,000	0	0	382	109,500	19,200	128,700	Oct.
2,246,000	255,000	202,000	4,000	146,000	0	385	106,500	84,300	190,800	Nov.
2,468,000	260,000	258,000	0	226,000	0	388	105,600	104,400	210,000	Dec.
	3,143,000	1,853,000	75,000	3,194,000	185,000	391	109,400	64,500	173,900	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1903											
Jan.	1,113,000	2,652,000	240,000	264,000	0	772,000	0	388	97,400	106,900	204,300
Feb.	633,000	2,489,000	226,000	222,000	0	126,000	0	390	101,900	100,100	202,000
Mar.	1,339,000	2,548,000	253,000	242,000	0	580,000	0	394	104,200	99,600	203,800
April	765,000	2,812,000	249,000	225,000	7,000	46,000	110,000	408	109,000	98,100	207,100
May	458,000	2,940,000	276,000	152,000	10,000	0	20,000	412	117,500	64,700	182,200
June	278,000	2,940,000	282,000	42,000	12,000	0	0	412	124,200	18,300	142,500
July	231,000	2,882,000	297,000	47,000	14,000	0	0	408	125,400	19,800	145,200
Aug.	204,000	2,755,000	303,000	39,000	13,000	0	0	402	126,700	16,300	143,000
Sept.	174,000	2,604,000	282,000	17,000	10,000	0	0	394	120,000	7,200	127,200
Oct.	199,000	2,469,000	278,000	12,000	7,000	0	0	388	113,400	4,800	118,200
Nov.	924,000	2,371,000	261,000	156,000	5,000	0	0	390	110,300	65,600	175,900
Dec.	530,000	2,873,000	263,000	229,000	0	310,000		400	109,400	95,300	204,700
Total or average	6,848,000		3,210,000	1,647,000	78,000	1,834,000	130,000	399	113,400	57,800	171,200
1904											
Jan.	473,000	2,601,000	238,000	232,000	0	83,000	0	392	97,400	94,500	191,900
Feb.	1,742,000	2,521,000	236,000	165,000	0	1,332,000	0	386	98,400	70,500	168,900
Mar.	2,877,000	2,530,000	256,000	262,000	0	2,031,000	0	387	104,200	105,800	210,000
April	1,467,000	2,858,000	250,000	234,000	7,000	146,000	748,000	405	109,000	101,000	210,000
May	914,000	2,940,000	279,000	220,000	10,000	0	405,000	406	117,500	92,500	210,000
June	505,000	2,940,000	283,000	196,000	12,000	0	48,000	410	124,200	85,800	210,000
July	377,000	2,906,000	298,000	201,000	14,000	0	0	406	125,400	84,600	210,000
Aug.	282,000	2,770,000	304,000	131,000	13,000	0	0	400	126,700	54,600	181,300
Sept.	271,000	2,604,000	282,000	114,000	10,000	0	0	393	120,000	48,300	168,300
Oct.	491,000	2,469,000	276,000	201,000	7,000	0	0	391	113,400	81,900	195,300
Nov.	379,000	2,476,000	263,000	241,000	5,000	0	0	386	110,300	99,700	210,000
Dec.	600,000	2,346,000	273,000	252,000	0	0	0	381	109,400	100,600	210,000
Total or average	10,378,000		3,238,000	2,449,000	78,000	3,592,000	1,201,000	395	113,000	85,100	198,100
1905											
Jan.	1,371,000	2,421,000	238,000	179,000	0	743,000	0	391	97,400	72,600	170,000
Feb.	1,027,000	2,632,000	224,000	229,000	0	607,000	0	393	101,900	103,600	205,500
Mar.	1,335,000	2,599,000	251,000	238,000	0	524,000	0	398	104,200	98,400	202,600
April	753,000	2,921,000	249,000	231,000	7,000	23,000	218,000	408	109,000	101,000	210,000
May	560,000	2,940,000	276,000	207,000	10,000	0	67,000	411	117,500	87,600	205,100
June	365,000	2,940,000	283,000	128,000	12,000	0	0	410	124,200	56,100	180,300
July	269,000	2,882,000	298,000	84,000	14,000	0	0	407	125,400	35,500	160,900
Aug.	236,000	2,755,000	304,000	70,000	13,000	0	0	400	126,700	29,200	155,900
Sept.	208,000	2,604,000	282,000	51,000	10,000	0	0	394	120,000	21,700	141,700
Oct.	221,000	2,469,000	278,000	34,000	7,000	0	0	388	113,400	13,800	127,200
Nov.	229,000	2,371,000	264,000	53,000	5,000	0	0	384	110,300	21,900	132,200
Dec.	249,000	2,278,000	270,000	0	0	0	0	380	109,400	0	109,400
Total or average	6,823,000		3,217,000	1,504,000	78,000	1,903,000	285,000	397	113,400	53,100	166,500
906											
Jan.	851,000	2,257,000	239,000	52,000	0	109,000	0	390	97,400	21,600	119,000
Feb.	872,000	2,708,000	222,000	141,000	0	611,000	0	398	101,900	63,700	165,600
Mar.	1,646,000	2,606,000	253,000	241,000	0	924,000	0	394	104,200	98,900	203,100
April	995,000	2,834,000	249,000	232,000	7,000	136,000	265,000	408	109,000	101,000	210,000
May	817,000	2,940,000	278,000	220,000	10,000	0	309,000	408	117,500	92,500	210,000
June	756,000	2,940,000	284,000	196,000	12,000	0	265,000	403	124,200	85,800	210,000
July	362,000	2,939,000	297,000	201,000	14,000	0	0	408	125,400	84,600	210,000
Aug.	280,000	2,789,000	304,000	148,000	13,000	0	0	400	126,700	61,700	188,400
Sept.	247,000	2,604,000	283,000	89,000	10,000	0	0	394	120,000	37,800	157,800
Oct.	251,000	2,469,000	278,000	64,000	7,000	0	0	388	113,400	26,100	139,500
Nov.	256,000	2,371,000	265,000	79,000	5,000	0	0	383	110,300	32,800	143,100
Dec.	648,000	2,278,000	272,000	186,000	0	0	0	382	109,400	74,300	183,700
Total or average	7,981,000		3,224,000	1,849,000	78,000	1,780,000	839,000	397	113,400	65,100	178,500

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1903
2,486,000	231,000	222,000	0	660,000	0	387	94,100	89,500	183,600	Jan.
2,486,000	219,000	249,000	0	165,000	0	386	98,500	111,500	210,000	Feb.
2,486,000	248,000	270,000	0	821,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	246,000	99,000	7,000	151,000	0	396	105,300	41,900	147,200	April
2,748,000	270,000	145,000	10,000	0	0	405	113,300	60,600	173,900	May
2,781,000	275,000	43,000	11,000	0	0	405	119,700	18,600	138,300	June
2,730,000	290,000	47,000	14,000	0	0	401	121,100	19,600	140,700	July
2,610,000	296,000	40,000	12,000	0	0	394	122,300	16,500	138,800	Aug.
2,466,000	276,000	17,000	9,000	0	0	388	115,800	7,100	122,900	Sept.
2,338,000	272,000	12,000	7,000	0	0	382	109,500	4,800	114,300	Oct.
2,246,000	257,000	166,000	4,000	257,000	0	380	106,500	68,200	174,700	Nov.
2,486,000	260,000	257,000	0	35,000	0	389	105,600	104,400	210,000	Dec.
	3,140,000	1,567,000	74,000	2,089,000	0	392	109,400	54,100	163,500	Total or average
										1904
2,464,000	230,000	202,000	0	19,000	0	390	94,100	82,300	176,400	Jan.
2,486,000	228,000	209,000	0	1,305,000	0	384	95,100	89,400	184,500	Feb.
2,486,000	252,000	276,000	0	2,349,000	0	378	100,500	109,500	210,000	Mar.
2,486,000	245,000	196,000	7,000	257,000	308,000	398	105,300	84,000	189,300	April
2,940,000	268,000	228,000	10,000	0	408,000	408	113,300	96,700	210,000	May
2,940,000	273,000	206,000	12,000	0	48,000	410	119,700	90,300	210,000	June
2,906,000	288,000	211,000	14,000	0	0	406	121,100	88,900	210,000	July
2,770,000	265,000	213,000	13,000	0	0	398	122,300	87,700	210,000	Aug.
2,531,000	276,000	178,000	10,000	0	0	388	115,800	74,600	190,400	Sept.
2,338,000	271,000	252,000	7,000	0	0	382	109,500	100,500	210,000	Oct.
2,299,000	260,000	249,000	4,000	0	0	376	106,500	101,500	208,000	Nov.
2,165,000	269,000	259,000	0	0	0	372	105,600	101,500	207,100	Dec.
	3,155,000	2,679,000	77,000	3,930,000	764,000	391	109,100	92,300	201,400	Total or average
										1905
2,237,000	234,000	158,000	0	730,000	0	384	94,100	63,600	157,700	Jan.
2,486,000	219,000	251,000	0	557,000	0	386	98,500	111,500	210,000	Feb.
2,486,000	249,000	272,000	0	814,000	0	385	100,500	109,500	210,000	Mar.
2,486,000	246,000	107,000	7,000	128,000	0	396	105,300	45,600	150,900	April
2,751,000	270,000	210,000	10,000	0	0	406	113,300	88,200	201,500	May
2,821,000	275,000	170,000	11,000	0	0	404	119,700	73,800	193,500	June
2,730,000	291,000	84,000	14,000	0	0	400	121,100	34,900	156,000	July
2,610,000	298,000	70,000	12,000	0	0	394	122,300	28,800	151,100	Aug.
2,466,000	276,000	51,000	9,000	0	0	387	115,800	21,400	137,200	Sept.
2,338,000	272,000	34,000	7,000	0	0	382	109,500	13,700	123,200	Oct.
2,246,000	259,000	53,000	4,000	0	0	378	106,500	21,800	128,300	Nov.
2,159,000	268,000	65,000	0	0	0	372	105,600	25,500	131,100	Dec.
	3,157,000	1,525,000	74,000	2,229,000	0	390	109,400	52,800	162,200	Total or average
										1906
2,075,000	235,000	109,000	0	96,000	0	380	94,100	44,400	138,500	Jan.
2,486,000	219,000	214,000	0	439,000	0	387	985,000	95,800	194,300	Feb.
2,486,000	248,000	273,000	0	1,101,000	0	384	100,500	109,500	210,000	Mar.
2,510,000	246,000	145,000	7,000	278,000	0	397	105,300	61,500	166,800	April
2,829,000	268,000	229,000	10,000	0	199,000	409	113,300	96,700	210,000	May
2,940,000	273,000	207,000	12,000	0	266,000	410	119,700	90,300	210,000	June
2,938,000	287,000	212,000	14,000	0	0	403	121,100	88,900	210,000	July
2,787,000	294,000	211,000	13,000	0	0	398	122,300	87,700	210,000	Aug.
2,549,000	276,000	172,000	10,000	0	0	388	115,800	72,200	188,000	Sept.
2,338,000	272,000	64,000	7,000	0	0	382	109,500	25,700	135,200	Oct.
2,246,000	259,000	80,000	4,000	0	0	378	106,500	32,900	139,400	Nov.
2,159,000	267,000	215,000	0	0	0	375	105,600	84,700	190,300	Dec.
	3,144,000	2,131,000	77,000	1,914,000	465,000	391	109,400	74,100	183,500	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1907											
Jan.	936,000	2,468,000	239,000	247,000	0	430,000	0	389	97,400	100,300	197,700
Feb.	1,636,000	2,488,000	229,000	243,000	0	1,122,000	0	384	101,900	108,100	210,000
Mar.	2,115,000	2,530,000	254,000	259,000	0	1,314,000	0	392	104,200	105,800	210,000
April	1,250,000	2,818,000	249,000	234,000	7,000	178,000	460,000	406	103,000	101,000	210,000
May	646,000	2,940,000	278,000	219,000	10,000	0	139,000	408	117,500	92,500	210,000
June	421,000	2,940,000	282,000	179,000	12,000	0	6,000	410	124,200	78,200	202,400
July	334,000	2,882,000	298,000	149,000	14,000	0	0	406	125,400	62,600	188,000
Aug.	291,000	2,755,000	304,000	125,000	13,000	0	0	400	126,700	52,000	178,700
Sept.	252,000	2,604,000	282,000	95,000	10,000	0	0	394	120,000	40,300	160,300
Oct.	261,000	2,469,000	278,000	74,000	7,000	0	0	388	113,400	30,100	143,500
Nov.	256,000	2,371,000	264,000	80,000	5,000	0	0	384	110,300	33,300	143,600
Dec.	479,000	2,278,000	273,000	138,000	0	0	0	380	109,400	55,100	164,500
Total or average	8,877,000		3,230,000	2,042,000	78,000	3,044,000	605,000	395	113,400	71,400	184,800
1908											
Jan.	904,000	2,346,000	237,000	94,000	0	264,000	0	394	97,400	38,300	135,700
Feb.	970,000	2,655,000	234,000	210,000	0	629,000	0	388	98,400	90,800	189,200
Mar.	669,000	2,552,000	250,000	88,000	0	37,000	0	401	104,200	36,300	140,500
April	527,000	2,846,000	247,000	134,000	7,000	0	45,000	411	109,000	58,300	167,300
May	492,000	2,940,000	276,000	187,000	10,000	0	19,000	411	117,500	79,600	197,100
June	340,000	2,940,000	283,000	103,000	12,000	0	0	410	124,200	45,100	169,300
July	260,000	2,882,000	298,000	75,000	14,000	0	0	407	125,400	31,600	157,000
Aug.	229,000	2,755,000	304,000	63,000	13,000	0	0	400	126,700	26,200	152,900
Sept.	205,000	2,604,000	282,000	48,000	10,000	0	0	394	120,000	20,400	140,400
Oct.	235,000	2,469,000	278,000	48,000	7,000	0	0	388	113,400	19,500	132,900
Nov.	257,000	2,371,000	264,000	81,000	5,000	0	0	384	110,300	33,800	144,100
Dec.	267,000	2,278,000	273,000	15,000	0	0	0	380	109,400	5,900	115,300
Total or average	5,355,000		3,226,000	1,146,000	78,000	930,000	64,000	398	113,000	40,200	153,200
1909											
Jan.	3,260,000	2,257,000	242,000	218,000	0	2,551,000	0	383	97,400	87,100	184,500
Feb.	2,526,000	2,506,000	227,000	242,000	0	1,938,000	0	386	101,900	108,100	210,000
Mar.	977,000	2,625,000	249,000	197,000	0	247,000	0	401	104,200	81,700	185,900
April	756,000	2,903,000	249,000	229,000	7,000	10,000	230,000	409	103,000	100,100	203,100
May	581,000	2,940,000	276,000	216,000	10,000	0	79,000	410	117,500	91,500	209,000
June	410,000	2,940,000	282,000	171,000	12,000	0	3,000	410	124,200	74,900	199,100
July	308,000	2,882,000	298,000	123,000	14,000	0	0	406	125,400	51,700	177,100
Aug.	264,000	2,755,000	304,000	98,000	13,000	0	0	400	126,700	40,900	167,600
Sept.	246,000	2,604,000	282,000	89,000	10,000	0	0	394	120,000	37,800	157,800
Oct.	284,000	2,469,000	278,000	97,000	7,000	0	0	388	113,400	39,400	152,800
Nov.	538,000	2,371,000	264,000	174,000	5,000	0	0	384	110,300	72,500	182,800
Dec.	721,000	2,466,000	266,000	245,000	0	39,000	0	395	109,400	100,600	210,000
Total or average	10,871,000		3,217,000	2,099,000	78,000	4,785,000	312,000	397	113,400	73,600	187,000
1910											
Jan.	708,000	2,637,000	235,000	139,000	0	327,000	0	398	97,400	57,000	154,400
Feb.	847,000	2,644,000	221,000	138,000	0	358,000	0	399	101,900	62,900	164,800
Mar.	1,239,000	2,774,000	247,000	239,000	0	351,000	236,000	406	104,200	100,400	204,600
April	665,000	2,940,000	249,000	232,000	7,000	0	177,000	408	103,000	101,000	210,000
May	415,000	2,940,000	276,000	128,000	10,000	0	1,000	412	117,500	54,400	171,900
June	282,000	2,940,000	282,000	46,000	12,000	0	0	412	124,200	20,100	144,300
July	254,000	2,882,000	297,000	70,000	14,000	0	0	408	125,400	29,400	154,800
Aug.	236,000	2,755,000	304,000	70,000	13,000	0	0	400	126,700	22,200	155,900
Sept.	214,000	2,604,000	282,000	57,000	10,000	0	0	394	120,000	24,200	144,200
Oct.	231,000	2,469,000	278,000	44,000	7,000	0	0	388	113,400	17,900	131,300
Nov.	274,000	2,371,000	265,000	97,000	5,000	0	0	383	110,300	40,300	150,600
Dec.	436,000	2,278,000	274,000	183,000	0	0	0	380	109,400	73,000	182,400
Total or average	5,801,000		3,210,000	1,443,000	78,000	1,036,000	414,000	399	113,400	50,800	164,200

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1907
2,325,000	231,000	249,000	0	295,000	0	388	94,100	100,900	195,000	Jan.
2,486,000	221,000	252,000	0	1,163,000	0	383	98,500	111,500	210,000	Feb.
2,486,000	249,000	273,000	0	1,593,000	0	383	100,500	109,500	210,000	Mar.
2,486,000	244,000	196,000	7,000	256,000	93,000	400	105,300	84,000	189,300	April
2,940,000	267,000	229,000	10,000	0	140,000	410	113,300	96,700	210,000	May
2,940,000	273,000	207,000	12,000	0	0	409	119,700	90,300	210,000	June
2,869,000	289,000	213,000	14,000	0	0	404	121,100	88,900	210,000	July
2,687,000	296,000	203,000	13,000	0	0	394	122,300	83,600	205,900	Aug.
2,466,000	277,000	94,000	9,000	0	0	386	115,800	39,300	155,100	Sept.
2,338,000	272,000	74,000	7,000	0	0	382	109,500	29,700	139,200	Oct.
2,246,000	259,000	80,000	4,000	0	0	378	106,500	32,900	139,400	Nov.
2,159,000	269,000	194,000	0	0	0	374	105,600	76,200	181,800	Dec.
	3,147,000	2,264,000	76,000	3,307,000	233,000	391	109,400	78,500	187,900	Total or average
										1908
2,175,000	232,000	121,000	0	240,000	0	386	94,100	48,500	142,600	Jan.
2,486,000	226,000	258,000	0	486,000	0	388	95,100	111,600	206,700	Feb.
2,486,000	248,000	269,000	0	152,000	0	389	100,500	109,400	209,900	Mar.
2,486,000	247,000	49,000	7,000	0	0	395	105,300	20,700	126,000	April
2,710,000	270,000	141,000	10,000	0	0	405	113,300	59,000	172,300	May
2,781,000	276,000	104,000	11,000	0	0	404	119,700	45,100	164,800	June
2,730,000	291,000	75,000	14,000	0	0	400	121,100	31,200	152,300	July
2,610,000	298,000	63,000	12,000	0	0	394	122,300	25,900	148,200	Aug.
2,466,000	276,000	48,000	9,000	0	0	387	115,800	20,100	135,900	Sept.
2,338,000	272,000	48,000	7,000	0	0	382	109,500	19,200	128,700	Oct.
2,246,000	259,000	81,000	4,000	0	0	378	106,500	33,300	139,800	Nov.
2,159,000	269,000	82,000	0	0	0	372	105,600	32,300	137,900	Dec.
	3,164,000	1,339,000	74,000	878,000	0	390	109,100	46,200	155,300	Total or average
										1909
2,075,000	236,000	226,000	0	2,387,000	0	378	94,100	89,700	183,800	Jan.
2,486,000	222,000	253,000	0	2,051,000	0	380	98,500	111,500	210,000	Feb.
2,486,000	248,000	273,000	0	456,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	246,000	123,000	7,000	77,000	0	397	105,300	52,500	157,800	April
2,789,000	269,000	230,000	10,000	0	0	406	113,300	96,700	210,000	May
2,861,000	275,000	208,000	12,000	0	0	406	119,700	90,300	210,000	June
2,776,000	290,000	170,000	14,000	0	0	400	121,100	70,800	191,900	July
2,610,000	298,000	98,000	12,000	0	0	394	122,300	40,300	162,600	Aug.
2,466,000	277,000	88,000	9,000	0	0	386	115,800	36,800	152,600	Sept.
2,338,000	273,000	96,000	7,000	0	0	381	109,500	38,400	147,900	Oct.
2,246,000	258,000	179,000	4,000	0	0	378	106,500	73,600	180,100	Nov.
2,343,000	261,000	258,000	0	84,000	0	387	105,600	104,400	210,000	Dec.
	3,153,000	2,202,000	75,000	5,055,000	0	390	109,400	76,100	185,500	Total or average
										1910
2,461,000	230,000	229,000	0	224,000	0	389	94,100	93,800	187,900	Jan.
2,486,000	219,000	249,000	0	379,000	0	388	98,500	111,500	210,000	Feb.
2,486,000	248,000	273,000	0	718,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	246,000	92,000	7,000	66,000	0	397	105,300	38,800	144,100	April
2,740,000	270,000	94,000	10,000	0	0	404	113,300	39,400	152,700	May
2,781,000	275,000	47,000	11,000	0	0	404	119,700	20,400	140,100	June
2,730,000	290,000	70,000	14,000	0	0	400	121,100	29,200	150,300	July
2,610,000	298,000	70,000	12,000	0	0	394	122,300	28,800	151,100	Aug.
2,466,000	276,000	57,000	9,000	0	0	387	115,800	23,900	139,700	Sept.
2,338,000	272,000	44,000	7,000	0	0	382	109,500	17,700	127,200	Oct.
2,246,000	259,000	98,000	4,000	0	0	377	106,500	40,300	146,800	Nov.
2,159,000	268,000	252,000	0	0	0	372	105,600	98,500	204,100	Dec.
	3,151,000	1,575,000	74,000	1,387,000	0	390	109,400	54,100	163,500	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1911											
Jan.	700,000	2,257,000	241,000	18,000	0	193,000	0	384	97,400	7,300	104,700
Feb.	848,000	2,505,000	226,000	168,000	0	377,000	0	389	101,900	75,000	176,900
Mar.	1,278,000	2,582,000	253,000	246,000	0	548,000	0	395	104,200	100,900	205,100
April	962,000	2,813,000	249,000	232,000	7,000	99,000	248,000	407	109,000	101,000	210,000
May	671,000	2,940,000	278,000	219,000	10,000	0	164,000	408	117,500	92,500	210,000
June	431,000	2,940,000	282,000	182,000	12,000	0	13,000	410	124,200	79,600	203,800
July	287,000	2,882,000	298,000	102,000	14,000	0	0	406	125,400	42,900	168,300
Aug.	244,000	2,755,000	304,000	78,000	13,000	0	0	400	126,700	32,500	159,200
Sept.	231,000	2,604,000	282,000	74,000	10,000	0	0	394	120,000	30,700	150,700
Oct.	246,000	2,469,000	278,000	59,000	7,000	0	0	388	113,400	24,100	137,500
Nov.	241,000	2,371,000	264,000	65,000	5,000	0	0	384	110,300	26,900	137,200
Dec.	244,000	2,278,000	273,000	0	0	0	0	380	109,400	0	109,400
Total or average	6,383,000		3,228,000	1,443,000	78,000	1,217,000	425,000	396	113,400	50,800	164,200
1912											
Jan.	517,000	2,249,000	239,000	0	0	0	0	388	97,400	0	97,400
Feb.	396,000	2,527,000	221,000	0	0	0	0	399	98,400	0	98,400
Mar.	635,000	2,702,000	246,000	118,000	0	0	33,000	409	104,200	50,300	154,500
April	487,000	2,940,000	247,000	182,000	7,000	0	51,000	411	109,000	80,000	189,000
May	714,000	2,940,000	277,000	217,000	10,000	0	210,000	410	117,500	91,900	209,400
June	405,000	2,940,000	282,000	158,000	12,000	0	11,000	411	124,200	69,000	193,200
July	274,000	2,882,000	298,000	89,000	14,000	0	0	406	125,400	37,500	162,900
Aug.	238,000	2,755,000	304,000	72,000	13,000	0	0	400	126,700	30,000	156,700
Sept.	242,000	2,604,000	282,000	85,000	10,000	0	0	394	120,000	36,000	156,000
Oct.	226,000	2,469,000	278,000	39,000	7,000	0	0	388	113,400	15,900	129,300
Nov.	432,000	2,371,000	264,000	210,000	5,000	0	0	385	110,300	87,100	197,400
Dec.	369,000	2,324,000	273,000	163,000	0	0	0	380	109,400	64,500	173,900
Total or average	4,935,000		3,211,000	1,333,000	78,000	0	305,000	398	113,000	46,900	159,900
1913											
Jan.	763,000	2,257,000	240,000	111,000	0	137,000	0	386	97,400	45,000	142,400
Feb.	387,000	2,532,000	222,000	17,000	0	0	0	399	101,900	7,600	109,500
Mar.	441,000	2,680,000	247,000	0	0	0	0	406	104,200	0	104,200
April	685,000	2,874,000	249,000	200,000	7,000	0	163,000	409	109,000	87,600	196,600
May	521,000	2,940,000	276,000	201,000	10,000	0	34,000	411	117,500	85,500	203,000
June	321,000	2,940,000	283,000	84,000	12,000	0	0	410	124,200	36,800	161,000
July	263,000	2,882,000	298,000	78,000	14,000	0	0	407	125,400	32,800	158,200
Aug.	232,000	2,755,000	304,000	66,000	13,000	0	0	400	126,700	27,600	154,300
Sept.	190,000	2,694,000	282,000	33,000	10,000	0	0	394	120,000	14,000	134,000
Oct.	202,000	2,469,000	278,000	15,000	7,000	0	0	388	113,400	6,000	119,400
Nov.	316,000	2,371,000	265,000	105,000	5,000	0	0	383	110,300	43,600	153,900
Dec.	696,000	2,312,000	272,000	183,000	0	0	0	381	109,400	72,900	182,300
Total or average	5,017,000		3,216,000	1,093,000	78,000	137,000	197,000	398	113,400	38,500	151,900
1914											
Jan.	2,797,000	2,553,000	238,000	258,000	0	2,075,000	0	392	97,400	105,200	202,600
Feb.	1,359,000	2,779,000	224,000	227,000	0	903,000	0	394	101,900	108,100	210,000
Mar.	987,000	2,774,000	249,000	240,000	0	374,000	0	402	104,200	99,600	203,800
April	1,137,000	2,898,000	249,000	231,000	7,000	6,000	602,000	407	109,000	100,700	209,700
May	703,000	2,940,000	278,000	220,000	10,000	0	195,000	408	117,500	92,500	210,000
June	452,000	2,940,000	283,000	196,000	12,000	0	13,000	410	124,200	85,800	210,000
July	303,000	2,888,000	298,000	130,000	14,000	0	0	406	125,400	54,800	180,200
Aug.	248,000	2,755,000	304,000	82,000	13,000	0	0	400	126,700	34,100	160,800
Sept.	225,000	2,604,000	282,000	68,000	10,000	0	0	394	120,000	28,800	148,800
Oct.	269,000	2,469,000	278,000	82,000	7,000	0	0	388	113,400	33,200	146,600
Nov.	252,000	2,371,000	265,000	75,000	5,000	0	0	383	110,300	31,100	141,400
Dec.	347,000	2,278,000	273,000	95,000	0	0	0	380	109,400	37,900	147,300
Total or average	9,085,000		3,221,000	1,914,000	78,000	3,358,000	810,000	397	113,400	67,400	180,800

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1911
2,075,000	237,000	9,000	0	43,000	0	376	94,100	3,800	97,900	Jan.
2,486,000	220,000	250,000	0	378,000	0	384	98,500	111,500	210,000	Feb.
2,486,000	249,000	267,000	0	762,000	0	385	100,500	107,700	208,200	Mar.
2,486,000	246,000	164,000	7,000	195,000	0	398	105,300	70,000	175,300	April
2,836,000	267,000	229,000	10,000	0	61,000	410	113,300	96,700	210,000	May
2,940,000	273,000	206,000	12,000	0	13,000	410	119,700	90,300	210,000	June
2,867,000	290,000	212,000	14,000	0	0	402	121,100	88,900	210,000	July
2,638,000	298,000	106,000	12,000	0	0	394	122,300	43,500	165,800	Aug.
2,466,000	277,000	73,000	9,000	0	0	386	115,800	30,600	146,400	Sept.
2,338,000	272,000	59,000	7,000	0	0	382	109,500	23,700	133,200	Oct.
2,246,000	259,000	65,000	4,000	0	0	378	106,500	26,700	133,200	Nov.
2,159,000	269,000	59,000	0	0	0	372	105,600	23,300	128,900	Dec.
	3,157,000	1,699,000	75,000	1,378,000	74,000	390	109,400	59,300	168,700	Total or average
										1912
2,075,000	236,000	0	0	0	0	378	94,100	0	94,100	Jan.
2,356,000	226,000	40,000	0	0	0	390	95,100	17,700	112,800	Feb.
2,486,000	246,000	269,000	0	120,000	0	390	100,500	109,500	210,000	Mar.
2,486,000	247,000	37,000	7,000	0	0	395	105,300	15,400	120,700	April
2,682,000	269,000	207,000	10,000	0	0	406	113,300	87,100	200,400	May
2,910,000	274,000	206,000	12,000	0	0	408	119,700	90,300	210,000	June
2,823,000	290,000	183,000	14,000	0	0	401	121,100	76,300	197,400	July
2,610,000	298,000	72,000	12,000	0	0	393	122,300	29,600	151,900	Aug.
2,466,000	277,000	84,000	9,000	0	0	386	115,800	35,100	150,900	Sept.
2,338,000	272,000	39,000	7,000	0	0	382	109,500	15,600	125,100	Oct.
2,246,000	258,000	220,000	4,000	0	0	378	106,500	90,100	196,600	Nov.
2,196,000	268,000	220,000	0	0	0	372	105,600	85,800	191,400	Dec.
	3,161,000	1,577,000	75,000	120,000	0	390	109,100	54,500	163,600	Total or average
										1913
2,077,000	234,000	98,000	0	22,000	0	381	94,100	39,800	133,900	Jan.
2,486,000	218,000	169,000	0	0	0	390	98,500	76,300	174,800	Feb.
2,486,000	245,000	196,000	0	0	0	391	100,500	80,100	180,600	Mar.
2,486,000	246,000	97,000	7,000	69,000	0	397	105,300	41,100	146,400	April
2,752,000	270,000	212,000	10,000	0	0	404	113,300	89,000	202,300	May
2,781,000	276,000	85,000	11,000	0	0	404	119,700	36,800	156,500	June
2,730,000	290,000	79,000	14,000	0	0	400	121,100	32,900	154,000	July
2,610,000	298,000	66,000	12,000	0	0	394	122,300	27,200	149,500	Aug.
2,466,000	276,000	33,000	9,000	0	0	387	115,800	13,900	129,700	Sept.
2,338,000	272,000	15,000	7,000	0	0	382	109,500	6,000	115,500	Oct.
2,246,000	259,000	107,000	4,000	0	0	377	106,500	43,800	150,300	Nov.
2,192,000	268,000	231,000	0	0	0	373	105,600	90,500	196,100	Dec.
	3,152,000	1,388,000	74,000	91,000	0	390	109,400	48,000	157,400	Total or average
										1914
2,389,000	235,000	291,000	0	2,174,000	0	379	94,100	115,900	210,000	Jan.
2,486,000	220,000	251,000	0	888,000	0	385	98,500	111,500	210,000	Feb.
2,486,000	248,000	273,000	0	466,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	244,000	190,000	7,000	167,000	75,000	400	105,300	81,800	187,100	April
2,940,000	267,000	229,000	10,000	0	197,000	409	113,300	96,700	210,000	May
2,940,000	273,000	207,000	12,000	0	0	409	119,700	90,300	210,000	June
2,900,000	288,000	214,000	14,000	0	0	404	121,100	88,900	210,000	July
2,693,000	296,000	166,000	13,000	0	0	395	122,300	68,400	190,700	Aug.
2,466,000	276,000	68,000	9,000	0	0	387	115,800	28,500	144,300	Sept.
2,338,000	272,000	82,000	7,000	0	0	382	109,500	32,900	142,400	Oct.
2,246,000	259,000	76,000	4,000	0	0	378	106,500	31,300	137,803	Nov.
2,159,000	269,000	162,000	0	0	0	372	105,600	63,700	169,300	Dec.
	3,147,000	2,209,000	76,000	3,695,000	272,000	390	109,400	76,500	185,900	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1915											
Jan.	895,000	2,257,000	239,000	101,000	0	324,000	0	388	97,400	40,900	138,300
Feb.	2,298,000	2,488,000	228,000	242,000	0	1,625,000	0	386	101,900	108,100	210,000
Mar.	1,264,000	2,691,000	250,000	256,000	0	522,000	0	399	104,200	105,800	210,000
April	1,159,000	2,927,000	249,000	234,000	7,000	38,000	618,000	405	109,000	101,000	210,000
May	1,256,000	2,940,000	279,000	220,000	10,000	0	747,000	406	117,500	92,500	210,000
June	572,000	2,940,000	283,000	195,000	12,000	0	99,000	410	124,200	85,800	210,000
July	343,000	2,923,000	298,000	199,000	14,000	0	0	406	125,400	83,900	209,300
Aug.	266,000	2,755,000	304,000	100,000	13,000	0	0	400	126,700	41,700	168,400
Sept.	215,000	2,604,000	282,000	58,000	10,000	0	0	394	120,000	24,700	144,700
Oct.	233,000	2,469,000	278,000	46,000	7,000	0	0	388	113,400	18,700	132,100
Nov.	254,000	2,371,000	264,000	78,000	5,000	0	0	384	110,300	32,400	142,700
Dec.	699,000	2,278,000	270,000	235,000	0	0	0	387	109,400	94,900	204,300
Total or average	9,454,000		3,224,000	1,964,000	78,000	2,509,000	1,464,000	396	113,400	69,000	182,400
1916											
Jan.	1,166,000	2,472,000	240,000	225,000	0	681,000	0	388	97,400	90,700	188,100
Feb.	1,616,000	2,492,000	237,000	252,000	0	1,077,000	0	384	98,400	107,900	206,300
Mar.	1,215,000	2,542,000	252,000	236,000	0	391,000	0	396	104,200	97,000	201,200
April	678,000	2,878,000	249,000	211,000	7,000	0	149,000	410	109,000	92,400	201,400
May	485,000	2,940,000	276,000	173,000	10,000	0	26,000	412	117,500	73,500	191,000
June	353,000	2,940,000	283,000	116,000	12,000	0	0	410	124,200	50,800	175,000
July	316,000	2,882,000	298,000	131,000	14,000	0	0	407	125,400	55,200	180,600
Aug.	244,000	2,755,000	304,000	78,000	13,000	0	0	400	126,700	32,500	159,200
Sept.	213,000	2,604,000	282,000	56,000	10,000	0	0	394	120,000	23,800	143,800
Oct.	236,000	2,469,000	278,000	49,000	7,000	0	0	388	113,400	19,900	133,300
Nov.	242,000	2,371,000	264,000	66,000	5,000	0	0	384	110,300	27,500	137,800
Dec.	363,000	2,278,000	273,000	111,000	0	0	0	380	109,400	44,500	153,900
Total or average	7,127,000		3,236,000	1,704,000	78,000	2,149,000	175,000	396	113,000	59,500	172,500
1917											
Jan.	312,000	2,257,000	242,000	0	0	0	0	382	97,400	0	97,400
Feb.	760,000	2,327,000	226,000	26,000	0	178,000	0	387	101,900	11,600	113,500
Mar.	459,000	2,657,000	247,000	8,000	0	0	0	406	104,200	3,500	107,700
April	906,000	2,861,000	249,000	196,000	7,000	0	375,000	408	109,000	85,600	194,600
May	580,000	2,940,000	276,000	210,000	10,000	0	84,000	411	117,500	89,000	206,500
June	320,000	2,940,000	283,000	92,000	12,000	0	0	410	124,200	40,300	164,500
July	238,000	2,882,000	297,000	54,000	14,000	0	0	408	125,400	22,700	148,100
Aug.	214,000	2,755,000	303,000	49,000	13,000	0	0	402	126,700	20,400	147,100
Sept.	185,000	2,604,000	282,000	28,000	10,000	0	0	394	120,000	11,900	131,900
Oct.	200,000	2,469,000	278,000	13,000	7,000	0	0	388	113,400	5,400	118,800
Nov.	224,000	2,371,000	264,000	48,000	5,000	0	0	384	110,300	20,000	130,300
Dec.	298,000	2,278,000	273,000	46,000	0	0	0	380	109,400	18,400	127,800
Total or average	4,705,000		3,220,000	770,000	78,000	178,000	459,000	397	113,400	27,400	140,800
1918											
Jan.	249,000	2,257,000	243,000	0	0	0	0	380	97,400	0	97,400
Feb.	399,000	2,263,000	229,000	0	0	0	0	383	101,900	0	101,900
Mar.	772,000	2,433,000	251,000	8,000	0	0	6,000	398	104,200	3,400	107,600
April	556,000	2,940,000	247,000	208,000	7,000	0	94,000	411	109,000	91,100	200,100
May	314,000	2,940,000	276,000	28,000	10,000	0	0	412	117,500	12,000	129,500
June	232,000	2,940,000	282,000	0	12,000	0	0	412	124,200	0	124,200
July	200,000	2,878,000	297,000	12,000	14,000	0	0	408	125,400	5,100	130,500
Aug.	192,000	2,755,000	303,000	27,000	13,000	0	0	402	126,700	11,200	137,900
Sept.	186,000	2,604,000	282,000	29,000	10,000	0	0	394	120,000	12,400	132,400
Oct.	258,000	2,469,000	278,000	71,000	7,000	0	0	388	113,400	28,900	142,300
Nov.	246,000	2,371,000	264,000	70,000	5,000	0	0	384	110,300	29,000	139,300
Dec.	258,000	2,278,000	270,000	9,000	0	0	0	380	109,400	3,600	113,000
Total or average	3,862,000		3,222,000	462,000	78,000	0	100,000	396	113,400	16,300	129,700

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1915
2,075,000	234,000	37,000	0	213,000	0	382	94,100	14,900	109,000	Jan.
2,486,000	223,000	253,000	0	1,822,000	0	378	98,500	111,500	210,000	Feb.
2,486,000	250,000	274,000	0	740,000	0	382	100,500	109,500	210,000	Mar.
2,486,000	245,000	179,000	7,000	267,000	7,000	399	105,300	76,800	182,100	April
2,940,000	268,000	231,000	10,000	0	747,000	408	113,300	96,700	210,000	May
2,940,000	274,000	206,000	12,000	0	80,000	408	119,700	90,300	210,000	June
2,940,000	288,000	211,000	14,000	0	0	406	121,100	88,900	210,000	July
2,770,000	295,000	213,000	13,000	0	0	397	122,300	87,700	210,000	Aug.
2,515,000	276,000	107,000	9,000	0	0	387	115,800	44,900	160,700	Sept.
2,338,000	272,000	46,000	7,000	0	0	382	109,500	18,400	127,900	Oct.
2,246,000	259,000	78,000	4,000	0	0	378	106,500	32,100	138,600	Nov.
2,159,000	263,000	252,000	0	0	0	381	105,600	100,100	205,700	Dec.
	3,147,000	2,087,000	76,000	3,042,000	834,000	391	109,400	72,400	181,800	Total or average
										1916
2,343,000	232,000	213,000	0	578,000	0	386	94,100	85,900	180,000	Jan.
2,486,000	226,000	261,000	0	1,129,000	0	386	95,100	111,600	206,700	Feb.
2,486,000	249,000	272,000	0	694,000	0	384	100,500	109,500	210,000	Mar.
2,486,000	246,000	99,000	7,000	61,000	0	397	105,300	41,900	147,200	April
2,751,000	270,000	175,000	10,000	0	0	404	113,300	73,400	186,700	May
2,781,000	276,000	117,000	11,000	0	0	404	119,700	50,700	170,400	June
2,730,000	291,000	131,000	14,000	0	0	400	121,100	54,600	175,700	July
2,610,000	298,000	78,000	12,000	0	0	394	122,300	32,000	154,300	Aug.
2,466,000	276,000	56,000	9,000	0	0	387	115,800	23,500	139,300	Sept.
2,338,000	272,000	49,000	7,000	0	0	382	109,500	19,600	129,100	Oct.
2,246,000	259,000	66,000	4,000	0	0	378	106,500	27,100	133,600	Nov.
2,159,000	269,000	178,000	0	0	0	372	105,600	70,000	175,600	Dec.
	3,164,000	1,695,000	74,000	2,462,000	0	389	109,100	58,300	167,400	Total or average
										1917
2,075,000	239,000	0	0	0	0	372	94,100	0	94,100	Jan.
2,148,000	223,000	27,000	0	172,000	0	377	98,500	11,900	110,400	Feb.
2,486,000	245,000	214,000	0	0	0	391	100,500	87,500	188,000	Mar.
2,486,000	245,000	172,000	7,000	55,000	0	399	105,300	73,500	178,800	April
2,913,000	267,000	226,000	10,000	0	57,000	410	113,300	96,700	210,000	May
2,933,000	274,000	209,000	12,000	0	0	407	119,700	90,300	210,000	June
2,767,000	291,000	90,000	14,000	0	0	400	121,100	37,500	158,600	July
2,610,000	298,000	48,000	12,000	0	0	394	122,300	19,800	142,100	Aug.
2,466,000	276,000	28,000	9,000	0	0	388	115,800	11,700	127,500	Sept.
2,338,000	272,000	13,000	7,000	0	0	382	109,500	5,200	114,700	Oct.
2,246,000	259,000	48,000	4,000	0	0	378	106,500	19,700	126,200	Nov.
2,159,000	269,000	113,000	0	0	0	372	105,600	44,400	150,000	Dec.
	3,158,000	1,188,000	75,000	227,000	57,000	389	109,400	41,700	151,100	Total or average
										1918
2,075,000	240,000	0	0	0	0	370	94,100	0	94,100	Jan.
2,084,000	224,000	0	0	0	0	376	98,500	0	98,500	Feb.
2,259,000	249,000	105,000	0	191,000	0	385	100,500	42,500	143,000	Mar.
2,486,000	246,000	58,000	7,000	20,000	0	397	105,300	24,400	129,700	April
2,711,000	270,000	0	10,000	0	0	404	113,300	0	113,300	May
2,745,000	276,000	0	11,000	0	0	403	119,700	0	119,700	June
2,690,000	291,000	0	14,000	0	0	400	121,100	0	121,100	July
2,585,000	296,000	3,000	12,000	0	0	394	122,300	1,200	123,500	Aug.
2,466,000	276,000	29,000	9,000	0	0	388	115,800	12,200	128,000	Sept.
2,338,000	272,000	71,000	7,000	0	0	382	109,500	28,500	138,000	Oct.
2,246,000	259,000	70,000	4,000	0	0	378	106,500	28,800	135,300	Nov.
2,159,000	269,900	73,000	0	0	0	372	105,600	28,800	134,400	Dec.
	3,168,000	409,000	74,000	211,000	0	387	109,400	14,000	123,400	Total or average

TABLE 4a (Continued). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1919											
Jan.	587,000	2,257,000	240,000	71,000	0	34,000	0	385	97,400	29,000	126,400
Feb.	1,163,000	2,499,000	226,000	222,000	0	671,000	0	387	101,900	99,600	201,500
Mar.	959,000	2,543,000	251,000	230,000	0	196,000	0	397	104,200	95,200	199,400
April	752,000	2,825,000	249,000	224,000	7,000	18,000	139,000	409	109,000	97,600	206,600
May	438,000	2,940,000	277,000	151,000	10,000	0	0	410	117,500	64,100	181,600
June	252,000	2,940,000	282,000	16,000	12,000	0	0	412	124,200	7,100	131,300
July	219,000	2,882,000	297,000	35,000	14,000	0	0	408	125,400	14,800	140,200
Aug.	199,000	2,755,000	303,000	34,000	13,000	0	0	402	126,700	14,200	140,900
Sept.	168,000	2,604,000	282,000	11,000	10,000	0	0	394	120,000	4,600	124,600
Oct.	203,000	2,469,000	278,000	16,000	7,000	0	0	388	113,400	6,500	119,900
Nov.	186,000	2,371,000	264,000	10,000	5,000	0	0	384	110,300	4,200	114,500
Dec.	180,000	2,278,000	274,000	0	0	0	0	378	109,400	0	109,400
Total or average	5,306,000		3,223,000	1,020,000	78,000	919,000	139,000	396	113,400	36,000	149,400
1920											
Jan.	207,000	2,184,000	245,000	0	0	0	0	375	97,400	0	97,400
Feb.	176,000	2,146,000	233,000	0	0	0	0	372	98,400	0	98,400
Mar.	372,000	2,089,000	263,000	0	0	0	0	374	104,200	0	104,200
April	493,000	2,198,000	262,000	0	6,000	0	0	383	109,000	0	109,000
May	286,000	2,423,000	288,000	0	9,000	0	0	388	117,500	0	117,500
June	216,000	2,412,000	296,000	0	10,000	0	0	386	124,200	0	124,200
July	192,000	2,322,000	312,000	0	12,000	0	0	380	125,400	0	125,400
Aug.	176,000	2,190,000	321,000	0	11,000	0	0	372	126,700	0	126,700
Sept.	140,000	2,034,000	301,000	0	8,000	0	0	363	120,000	0	120,000
Oct.	180,000	1,865,000	301,000	0	6,000	0	0	354	113,400	0	113,400
Nov.	896,000	1,738,000	286,000	25,000	4,000	0	0	359	110,300	10,400	120,700
Dec.	1,121,000	2,319,000	266,000	245,000	0	202,000	0	395	109,400	100,600	210,000
Total or average	4,455,000		3,374,000	270,000	66,000	202,000	0	375	113,000	9,400	122,400
1921											
Jan.	1,492,000	2,727,000	239,000	277,000	0	1,050,000	0	390	97,400	112,600	210,000
Feb.	1,035,000	2,653,000	226,000	240,000	0	660,000	0	390	101,900	108,100	210,000
Mar.	982,000	2,562,000	252,000	244,000	0	226,000	0	396	104,200	100,900	205,100
April	559,000	2,822,000	246,000	164,000	7,000	0	24,000	411	109,000	71,900	180,900
May	493,000	2,940,000	276,000	195,000	10,000	0	12,000	411	117,500	83,200	200,700
June	316,000	2,940,000	283,000	79,000	12,000	0	0	410	124,200	34,600	158,800
July	220,000	2,882,000	297,000	36,000	14,000	0	0	408	125,400	15,200	140,600
Aug.	192,000	2,755,000	303,000	27,000	13,000	0	0	402	126,700	11,200	137,900
Sept.	175,000	2,604,000	282,000	18,000	10,000	0	0	394	120,000	7,800	127,800
Oct.	196,000	2,469,000	277,000	0	7,000	0	0	389	113,400	0	113,400
Nov.	205,000	2,381,000	264,000	39,000	5,000	0	0	384	110,300	16,300	126,600
Dec.	390,000	2,278,000	273,000	72,000	0	0	0	381	109,400	28,900	138,300
Total or average	6,255,000		3,218,000	1,391,000	78,000	1,936,000	36,000	397	113,400	48,900	162,300
1922											
Jan.	300,000	2,323,000	240,000	0	0	0	0	387	97,400	0	97,400
Feb.	679,000	2,383,000	225,000	44,000	0	136,000	0	392	101,900	19,900	121,800
Mar.	567,000	2,657,000	246,000	17,000	0	0	21,000	407	104,200	7,300	111,500
April	604,000	2,940,000	248,000	214,000	7,000	0	135,000	410	109,000	93,600	202,600
May	577,000	2,940,000	276,000	209,000	10,000	0	82,000	411	117,500	88,300	205,800
June	317,000	2,940,000	283,000	80,000	12,000	0	0	410	124,200	35,000	159,200
July	203,000	2,882,000	297,000	19,000	14,000	0	0	408	125,400	7,900	133,300
Aug.	182,000	2,755,000	303,000	17,000	13,000	0	0	402	126,700	7,100	133,800
Sept.	161,000	2,604,000	282,000	4,000	10,000	0	0	394	120,000	1,700	121,700
Oct.	208,000	2,469,000	278,000	21,000	7,000	0	0	388	113,400	8,600	122,000
Nov.	244,000	2,371,000	264,000	68,000	5,000	0	0	384	110,300	28,300	138,600
Dec.	462,000	2,278,000	273,000	139,000	0	0	0	380	109,400	55,100	164,500
Total or average	4,504,000		3,215,000	832,000	78,000	136,000	238,000	398	113,400	29,400	142,800

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1919
2,075,000	236,000	0	0	0	0	377	94,100	0	94,100	Jan.
2,426,000	220,000	188,000	0	695,000	0	386	98,500	83,800	182,300	Feb.
2,486,000	248,000	270,000	0	441,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	246,000	109,000	7,000	109,000	0	396	105,300	46,400	151,700	April
2,767,000	270,000	144,000	10,000	0	0	405	113,300	60,500	173,800	May
2,781,000	275,000	17,000	11,000	0	0	405	119,700	7,400	127,100	June
2,730,000	290,000	35,000	14,000	0	0	401	121,100	14,700	135,800	July
2,610,000	296,000	35,000	12,000	0	0	394	122,300	14,400	136,700	Aug.
2,466,000	276,000	11,000	9,000	0	0	388	115,800	4,600	120,400	Sept.
2,338,000	272,000	16,000	7,000	0	0	382	109,500	6,500	116,000	Oct.
2,246,000	259,000	10,000	4,000	0	0	378	106,500	4,200	110,700	Nov.
2,159,000	268,000	0	0	0	0	372	105,600	0	105,600	Dec.
	3,156,000	835,000	74,000	1,245,000	0	389	109,400	29,000	138,400	Total or average
										1920
2,071,000	239,000	0	0	0	0	370	94,100	0	94,100	Jan.
2,039,000	236,000	0	0	0	0	367	95,100	0	95,100	Feb.
1,979,000	257,000	0	0	0	0	368	100,500	0	100,500	Mar.
2,094,000	256,000	0	6,000	0	0	377	105,300	0	105,300	April
2,325,000	281,000	0	9,000	0	0	384	113,300	0	113,300	May
2,321,000	288,000	0	10,000	0	0	382	119,700	0	119,700	June
2,239,000	306,000	0	12,000	0	0	376	121,100	0	121,100	July
2,113,000	314,000	0	11,000	0	0	368	122,300	0	122,300	Aug.
1,964,000	293,000	0	8,000	0	0	360	115,800	0	115,800	Sept.
1,803,000	293,000	0	6,000	0	0	351	109,500	0	109,500	Oct.
1,684,000	266,000	0	4,000	0	0	365	106,500	0	106,500	Nov.
2,310,000	261,000	192,000	0	492,000	0	386	105,600	77,300	182,900	Dec.
	3,290,000	192,000	66,000	492,000	0	371	109,100	6,500	115,600	Total or average
										1921
2,486,000	233,000	288,000	0	971,000	0	385	94,100	115,900	210,000	Jan.
2,486,000	220,000	250,000	0	565,000	0	385	98,500	111,500	210,000	Feb.
2,486,000	248,000	270,000	0	464,000	0	386	100,500	109,500	210,000	Mar.
2,486,000	246,000	59,000	7,000	43,000	0	395	105,300	24,400	129,700	April
2,690,000	270,000	122,000	10,000	0	0	404	113,300	51,100	164,400	May
2,781,000	276,000	80,000	11,000	0	0	404	119,700	34,700	154,400	June
2,730,000	290,000	35,000	14,000	0	0	400	121,100	15,100	136,200	July
2,610,000	296,000	28,000	12,000	0	0	394	122,300	11,600	133,900	Aug.
2,466,000	276,000	18,000	9,000	0	0	388	115,800	7,500	123,300	Sept.
2,338,000	272,000	9,000	7,000	0	0	382	109,500	3,600	113,100	Oct.
2,246,000	259,000	29,000	4,000	0	0	378	106,500	11,900	118,400	Nov.
2,159,000	268,000	120,000	0	0	0	373	105,600	47,200	152,800	Dec.
	3,154,000	1,309,000	74,000	2,043,000	0	390	109,400	45,100	154,500	Total or average
										1922
2,161,000	237,000	0	0	0	0	376	94,100	0	94,100	Jan.
2,224,000	221,000	62,000	0	134,000	0	383	98,500	28,000	126,500	Feb.
2,486,000	246,000	239,000	0	82,000	0	390	100,500	97,300	197,800	Mar.
2,486,000	247,000	59,000	7,000	80,000	0	395	105,300	24,400	129,700	April
2,697,000	270,000	178,000	10,000	0	0	405	113,300	74,900	188,200	May
2,815,000	276,000	116,000	11,000	0	0	404	119,700	50,300	170,000	June
2,730,000	290,000	19,000	14,000	0	0	400	121,100	7,900	129,000	July
2,610,000	296,000	18,000	12,000	0	0	394	122,300	7,400	129,700	Aug.
2,466,000	276,000	4,000	9,000	0	0	388	115,800	1,700	117,500	Sept.
2,338,000	272,000	21,000	7,000	0	0	382	109,500	8,500	118,000	Oct.
2,246,000	259,000	68,000	4,000	0	0	378	106,500	27,900	134,400	Nov.
2,159,000	269,000	197,000	0	0	0	372	105,600	76,900	182,500	Dec.
	3,159,000	981,000	74,000	296,000	0	389	109,400	33,900	143,300	Total or average

TABLE 4a (Concluded). KENNETT

COMPARISON OF WATER AND POWER YIELD, OPERATING PRI
FOR
TWO METHODS OF
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Estimated run-off at dam site in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 ac.-ft.									
		Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)		
			Primary	Secondary					*Primary	Secondary	Total
1923											
Jan.	467,000	2,328,000	240,000	130,000	0	0	0	385	97,400	52,400	149,800
Feb.	237,000	2,425,000	225,000	0	0	0	0	390	101,900	0	101,900
Mar.	287,000	2,497,000	253,000	0	0	0	0	393	104,200	0	104,200
April	632,000	2,531,000	250,000	0	7,000	0	0	405	109,000	0	109,000
May	322,000	2,906,000	275,000	3,000	10,000	0	0	412	117,500	1,300	118,800
June	236,000	2,940,000	282,000	0	12,000	0	0	412	124,200	0	124,200
July	184,000	2,882,000	297,000	0	14,000	0	0	408	125,400	0	125,400
Aug.	165,000	2,755,000	303,000	0	13,000	0	0	402	126,700	0	126,700
Sept.	157,000	2,604,000	282,000	0	10,000	0	0	394	120,000	0	120,000
Oct.	187,000	2,469,000	278,000	0	7,000	0	0	388	113,400	0	113,400
Nov.	176,000	2,371,000	264,000	0	5,000	0	0	384	110,300	0	110,300
Dec.	184,000	2,278,000	274,000	0	0	0	0	379	109,400	0	109,400
Total or average	3,294,000		3,223,000	133,000	78,000	0	0	398	113,400	4,600	118,000
1924											
Jan.	203,000	2,188,000	245,000	0	0	0	0	376	97,400	0	97,400
Feb.	332,000	2,146,000	231,000	0	0	0	0	378	98,400	0	98,400
Mar.	200,000	2,247,000	260,000	0	0	0	0	379	104,200	0	104,200
April	176,000	2,187,000	266,000	0	6,000	0	0	374	109,000	0	109,000
May	155,000	2,091,000	301,000	0	8,000	0	0	367	117,500	0	117,500
June	141,000	1,937,000	315,000	0	9,000	0	0	358	124,200	0	124,200
July	140,000	1,754,000	341,000	0	10,000	0	0	345	125,400	0	125,400
Aug.	140,000	1,543,000	360,000	0	8,000	0	0	330	126,700	0	126,700
Sept.	128,000	1,315,000	349,000	0	6,000	0	0	312	120,000	0	120,000
Oct.	178,000	1,088,000	363,000	0	4,000	0	0	293	113,400	0	113,400
Nov.	317,000	899,000	356,000	0	2,000	0	0	282	110,300	0	110,300
Dec.	321,000	858,000	372,000	0	0	0	0	277	109,400	0	109,400
Total or average	2,431,000		3,759,000	0	53,000	0	0	339	113,000	0	113,000
1925											
Jan.	301,000	807,000	336,000	0	0	0	0	273	97,400	0	97,400
Feb.	1,769,000	772,000	264,000	0	0	0	0	326	101,900	0	101,900
Mar.	563,000	2,277,000	255,000	0	0	0	0	389	104,200	0	104,200
April	926,000	2,585,000	250,000	124,000	7,000	0	190,000	403	109,000	53,800	162,800
May	474,000	2,940,000	276,000	167,000	10,000		21,000	412	117,500	70,800	188,300
June	276,000	2,940,000	282,000	40,000	12,000	0	0	411	124,200	17,500	141,700
July	173,000	2,882,000	297,000	0	14,000	0	0	408	125,400	0	125,400
Aug.	167,000	2,744,000	304,000	0	13,000	0	0	400	126,700	0	126,700
Sept.	163,000	2,594,000	282,000	0	10,000	0	0	394	120,000	0	120,000
Oct.	181,000	2,465,000	278,000	0	7,000	0	0	388	113,400	0	113,400
Nov.	192,000	2,361,000	264,000	6,000	5,000	0	0	384	110,300	2,500	112,800
Dec.	235,000	2,278,000	273,000	0	0	0	0	380	109,400	0	109,400
Total or average	5,420,000		3,361,000	337,000	78,000	0	211,000	381	113,400	12,100	125,500
Total for 30-year period, 1896-1926	188,012,000		97,481,000	37,094,000	2,300,000	40,414,000	10,739,000				
Average for 30-year period, 1896-1926	6,267,000		3,249,000	1,236,000	77,000	1,347,000	358,000	393.8	113,400	43,490	156,800

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

MARILY FOR POWER GENERATION WITH INCIDENTAL IRRIGATION

FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 4, page 114.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (454,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Red Bluff 125,000 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Power draft through turbines in acre-feet		Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Average power head in feet	Average power yield in kilowatts (Load factor=0.75)			Year and month
	Primary	Secondary					*Primary	Secondary	Total	
										1923
2,155,000	235,000	0	0	0	0	380	94,100	0	94,100	Jan.
2,387,000	218,000	0	0	0	0	390	98,500	0	98,500	Feb.
2,466,000	245,000	22,000	0	0	0	392	100,500	9,000	109,500	Mar.
2,486,000	246,000	49,000	7,000	77,000	0	398	105,300	20,600	125,900	April
2,739,000	270,000	0	10,000	0	0	406	113,300	0	113,300	May
2,781,000	276,000	0	11,000	0	0	405	119,700	0	119,700	June
2,730,000	290,000	0	14,000	0	0	401	121,100	0	121,100	July
2,610,000	297,000	0	12,000	0	0	394	122,300	0	122,300	Aug.
2,466,000	276,000	0	9,000	0	0	388	115,800	0	115,800	Sept.
2,338,000	272,000	0	7,000	0	0	382	109,500	0	109,500	Oct.
2,246,000	259,000	0	4,000	0	0	378	106,500	0	106,500	Nov.
2,159,000	268,000	0	0	0	0	372	105,600	0	105,600	Dec.
	3,152,000	71,000	74,000	77,000	0	390	109,400	2,500	111,900	Total or average
										1924
2,075,000	240,000	0	0	0	0	370	94,100	0	94,100	Jan.
2,038,000	226,000	0	0	0	0	372	95,100	0	95,100	Feb.
2,144,000	255,000	0	0	0	0	374	100,500	0	100,500	Mar.
2,089,000	261,000	0	6,000	0	0	369	105,300	0	105,300	April
1,998,000	295,000	0	8,000	0	0	362	113,300	0	113,300	May
1,850,000	309,000	0	9,000	0	0	352	119,700	0	119,700	June
1,673,000	334,000	0	10,000	0	0	340	121,100	0	121,100	July
1,469,000	354,000	0	8,000	0	0	324	122,300	0	122,300	Aug.
1,247,000	343,000	0	6,000	0	0	306	115,800	0	115,800	Sept.
1,026,000	357,000	0	4,000	0	0	288	109,500	0	109,500	Oct.
843,000	351,000	0	2,000	0	0	276	106,500	0	106,500	Nov.
807,000	367,000	0	0	0	0	272	105,600	0	105,600	Dec.
	3,692,000	0	53,000	0	0	334	109,100	0	109,100	Total or average
										1925
761,000	332,000	0	0	0	0	268	94,100	0	94,100	Jan.
730,000	258,000	0	0	0	0	323	98,500	0	98,500	Feb.
2,241,000	247,000	54,000	0	17,000	0	388	100,500	21,900	122,400	Mar.
2,486,000	245,000	155,000	7,000	130,000	0	399	105,300	66,500	171,800	April
2,875,000	268,000	231,000	10,000	0	0	408	113,300	96,700	210,000	May
2,840,000	275,000	99,000	12,000	0	0	405	119,700	42,900	162,600	June
2,730,000	291,000	0	14,000	0	0	400	121,100	0	121,100	July
2,598,000	298,000	0	12,000	0	0	394	122,300	0	122,300	Aug.
2,455,000	276,000	0	9,000	0	0	387	115,800	0	115,800	Sept.
2,333,000	272,000	0	7,000	0	0	382	109,500	0	109,500	Oct.
2,235,000	259,000	5,000	4,000	0	0	377	106,500	2,100	108,600	Nov.
2,159,000	269,000	50,000	0	0	0	372	105,600	19,600	125,200	Dec.
	3,290,000	594,000	75,000	147,000	0	375	109,400	20,900	130.300	Total or average
	95,438,000	**40,980,000**	**2,208,000**	**45,734,000**	**3,652,000**					**Total for 30-year period, 1896-1926**
	3,181,000	**1,366,000**	**74,000**	**1,524,000**	**122,000**	**386.9**	**109,400**	**47,300**	**156,700**	**Average for 30-year period, 1896-1926**

TABLE 5a. KENNETT RESER

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1896									
Jan.	97,400	40,500	137,900	97,400	47,200	144,600	94,100	52,300	146,400
Feb.	98,400	78,000	176,400	98,400	22,300	120,700	95,100	79,300	174,400
Mar.	104,200	91,100	195,300	104,200	20,400	124,600	100,500	91,400	191,900
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	49,000	154,300
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	85,800	210,000	124,200	85,800	210,000	119,700	90,300	210,000
July	125,400	63,700	189,100	125,400	63,700	189,100	121,100	88,900	210,000
Aug.	126,700	42,500	169,200	126,700	42,500	169,200	122,300	81,600	203,900
Sept.	120,000	42,800	162,800	120,000	42,800	162,800	115,800	41,800	157,600
Oct.	113,400	30,500	143,900	113,400	30,500	143,900	109,500	30,100	139,600
Nov.	110,300	66,800	177,100	110,300	66,800	177,100	106,500	69,700	176,200
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	104,400	210,000
Total or average	113,000	69,500	182,500	113,000	59,700	172,700	109,100	73,000	182,100
1897									
Jan.	97,400	55,000	152,400	97,400	71,000	168,400	94,100	83,300	177,400
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	53,200	157,400	100,500	107,000	207,500
April	109,000	101,000	210,000	109,000	81,400	190,400	105,300	66,500	171,800
May	117,500	82,500	200,000	117,500	82,500	200,000	113,300	96,700	210,000
June	124,200	32,100	156,300	124,200	32,100	156,300	119,700	90,300	210,000
July	125,400	37,900	163,300	125,400	37,900	163,300	121,100	37,600	158,700
Aug.	126,700	36,200	162,900	126,700	36,200	162,900	122,300	36,200	158,500
Sept.	120,000	38,200	158,200	120,000	38,200	158,200	115,800	37,200	153,000
Oct.	113,400	30,500	143,900	113,400	30,500	143,900	109,500	30,100	139,600
Nov.	110,300	40,300	150,600	110,300	40,300	150,600	106,500	40,300	146,800
Dec.	109,400	45,200	154,600	109,400	45,200	154,600	105,600	71,500	177,100
Total or average	113,400	59,100	172,500	113,400	54,300	167,700	109,400	67,100	176,500
1898									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	0	101,900	98,500	0	98,500
Mar.	104,200	0	104,200	104,200	0	104,200	100,500	0	100,500
April	109,000	0	109,000	109,000	0	109,000	105,300	0	105,300
May	117,500	0	117,500	117,500	0	117,500	113,300	0	113,300
June	124,200	0	124,200	124,200	0	124,200	119,700	0	119,700
July	125,400	0	125,400	125,400	0	125,400	121,100	0	121,100
Aug.	126,700	0	126,700	126,700	0	126,700	122,300	0	122,300
Sept.	120,000	0	120,000	120,000	0	120,000	115,800	0	115,800
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	0	109,500
Nov.	110,300	8,800	119,100	110,300	8,800	119,100	106,500	5,300	111,800
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	13,000	118,600
Total or average	113,400	700	114,100	113,400	700	114,100	109,400	1,500	110,900
1899									
Jan.	97,400	0	97,400	97,400	18,400	115,800	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	0	101,900	98,500	0	98,500
Mar.	104,200	27,300	131,500	104,200	23,900	128,100	100,500	85,900	186,400
April	109,000	76,300	185,300	109,000	61,500	170,500	105,300	24,400	129,700
May	117,500	18,800	136,300	117,500	18,800	136,300	113,300	0	113,300
June	124,200	25,700	149,900	124,200	25,700	149,900	119,700	0	119,700
July	125,400	23,100	148,500	125,400	23,100	148,500	121,100	0	121,100
Aug.	126,700	24,200	150,900	126,700	24,200	150,900	122,300	23,400	145,700
Sept.	120,000	16,900	136,900	120,000	16,900	136,900	115,800	16,800	132,600
Oct.	113,400	26,500	139,900	113,400	26,500	139,900	109,500	26,100	135,600
Nov.	110,300	77,900	188,200	110,300	77,900	188,200	106,500	80,700	187,200
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	104,400	210,000
Total or average	113,400	34,900	148,300	113,400	35,000	148,400	109,400	30,400	139,800

*Total primary power production in February of leap years taken the same as in other years.

VOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation. Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights). Average power yield in kilowatts (Load factor=1.00)						
Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1896
0	89,900	89,900	0	99,100	99,100	Jan.
0	199,400	199,400	0	104,000	104,000	Feb.
0	225,300	225,300	0	134,900	134,900	Mar.
0	275,800	275,800	0	275,800	275,800	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	176,100	176,100	0	176,100	176,100	Sept.
0	56,200	56,200	0	56,200	56,200	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	178,400	178,400	0	164,000	164,000	Total or average
						1897
0	59,800	59,800	0	195,700	195,700	Jan.
0	280,000	280,000	0	276,000	276,000	Feb.
0	254,600	254,600	0	171,600	171,600	Mar.
0	280,000	280,000	0	242,100	242,100	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	264,400	264,400	0	264,400	264,400	Aug.
0	152,400	152,400	0	152,400	152,400	Sept.
0	48,000	48,000	0	48,000	48,000	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	180,800	180,800	0	181,900	181,900	Total or average
						1898
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	17,300	17,300	0	17,300	17,300	Mar.
0	91,000	91,000	0	91,000	91,000	April
0	275,000	275,000	0	275,000	275,000	May
0	280,000	280,000	0	280,000	28,000	June
0	260,200	260,200	0	260,200	260,200	July
0	162,000	162,000	0	162,000	162,000	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	91,200	91,200	0	91,200	91,200	Total or average
						1899
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	15,900	15,900	0	15,900	15,900	Mar.
0	89,300	89,300	0	89,300	89,300	April
0	272,400	272,400	0	272,400	272,400	May
0	280,000	280,000	0	280,000	280,000	June
0	252,000	252,000	0	252,000	252,000	July
0	146,100	146,100	0	146,100	146,100	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	88,700	88,700	0	88,700	88,700	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1900									
Jan.	97,400	103,500	200,900	97,400	110,900	208,300	94,100	112,900	207,000
Feb.	101,900	62,500	164,400	101,900	22,000	123,900	98,500	64,900	163,400
Mar.	104,200	102,400	206,600	104,200	43,800	148,000	100,500	104,200	204,700
April	109,000	80,300	189,300	109,000	33,900	142,900	105,300	20,700	126,000
May	117,500	46,600	164,100	117,500	46,600	164,100	113,300	0	113,300
June	124,200	4,900	129,100	124,200	4,900	129,100	119,700	0	119,700
July	125,400	14,800	140,200	125,400	14,800	140,200	121,100	14,700	135,800
Aug.	126,700	17,900	144,600	126,700	17,900	144,600	122,300	18,100	140,400
Sept.	120,000	18,800	138,800	120,000	18,800	138,800	115,800	18,500	134,300
Oct.	113,400	49,200	162,600	113,400	49,200	162,600	109,500	48,500	158,000
Nov.	110,300	59,700	170,000	110,300	59,700	170,000	106,500	61,900	168,400
Dec.	109,400	89,000	198,400	109,400	89,000	198,400	105,600	99,200	204,800
Total or average	113,400	54,200	167,600	113,400	42,900	156,300	109,400	47,100	156,500
1901									
Jan.	97,400	39,900	137,300	97,400	101,600	199,000	94,100	115,900	210,000
Feb.	101,900	104,200	206,100	101,900	99,400	201,300	98,500	103,800	205,300
Mar.	104,200	103,800	208,000	104,200	52,400	156,600	100,500	105,000	205,500
April	109,000	54,000	163,000	109,000	0	109,000	105,300	15,400	120,700
May	117,500	51,100	168,600	117,500	28,500	146,000	113,300	0	113,300
June	124,200	1,800	126,000	124,200	1,800	126,000	119,700	0	119,700
July	125,400	14,200	139,600	125,400	14,200	139,600	121,100	0	121,100
Aug.	126,700	17,100	143,800	126,700	17,100	143,800	122,300	0	122,300
Sept.	120,000	18,200	138,200	120,000	18,200	138,200	115,800	20,600	136,400
Oct.	113,400	11,400	124,800	113,400	11,400	124,800	109,500	11,300	120,800
Nov.	110,300	42,500	152,800	110,300	42,500	152,800	106,500	43,300	149,800
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	104,400	210,000
Total or average	113,400	46,300	159,700	113,400	40,400	153,800	109,400	43,400	152,800
1902									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	69,300	171,200	101,900	77,100	179,000	98,500	79,800	178,300
Mar.	104,200	105,800	210,000	104,200	75,300	179,500	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	81,500	190,500	105,300	73,500	178,800
May	117,500	91,400	208,900	117,500	91,400	208,900	113,300	96,700	210,000
June	124,200	71,700	195,900	124,200	71,700	195,900	119,700	90,300	210,000
July	125,400	29,000	154,400	125,400	29,000	154,400	121,100	78,800	199,900
Aug.	126,700	28,400	155,100	126,700	28,400	155,100	122,300	27,800	150,100
Sept.	120,000	11,400	131,400	120,000	11,400	131,400	115,800	11,400	127,200
Oct.	113,400	19,500	132,900	113,400	19,500	132,900	109,500	19,200	128,700
Nov.	110,300	81,100	191,400	110,300	81,100	191,400	106,500	84,300	190,800
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	104,400	210,000
Total or average	113,400	58,900	172,300	113,400	55,300	168,700	109,400	64,500	173,900
1903									
Jan.	97,400	90,300	187,700	97,400	106,900	204,300	94,100	89,500	183,600
Feb.	101,900	108,100	210,000	101,900	100,100	202,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	99,600	203,800	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	98,100	207,100	105,300	41,900	147,200
May	117,500	64,700	182,200	117,500	64,700	182,200	113,300	60,600	173,900
June	124,200	18,300	142,500	124,200	18,300	142,500	119,700	18,600	138,300
July	125,400	19,800	145,200	125,400	19,800	145,200	121,100	19,600	140,700
Aug.	126,700	16,300	143,000	126,700	16,300	143,000	122,300	16,500	138,800
Sept.	120,000	7,200	127,200	120,000	7,200	127,200	115,800	7,100	122,900
Oct.	113,400	4,800	118,200	113,400	4,800	118,200	109,500	4,800	114,300
Nov.	110,300	65,600	175,900	110,300	65,600	175,900	106,500	68,200	174,700
Dec.	109,400	100,600	210,000	109,400	95,300	204,700	105,600	104,400	210,000
Total or average	113,400	58,200	171,600	113,400	57,800	171,200	109,400	54,100	163,500

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1900
0	0	0	0	73,800	73,800	Jan.
0	57,300	57,300	0	125,100	125,100	Feb.
0	247,400	247,400	0	137,400	137,400	Mar.
0	197,800	197,800	0	170,600	170,600	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	232,500	232,500	0	232,500	232,500	Aug.
0	124,400	124,400	0	124,400	124,400	Sept.
0	38,200	38,200	0	38,200	38,200	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	145,500	145,500	0	145,300	145,300	Total or average
						1901
0	0	0	0	0	0	Jan.
0	89,700	89,700	0	214,700	214,700	Feb.
0	248,800	248,800	0	159,100	159,100	Mar.
0	165,000	165,000	0	105,000	105,000	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	230,900	230,900	0	230,900	230,900	Aug.
0	123,100	123,100	0	123,100	123,100	Sept.
0	35,900	35,900	0	35,900	35,900	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec
0	144,900	144,900	0	142,000	142,000	Total or average
						1902
0	0	0	0	0	0	Jan.
0	110,100	110,100	0	149,600	149,600	Feb.
0	273,700	273,700	0	218,000	218,000	Mar.
0	277,200	277,200	0	241,500	241,500	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	160,600	160,600	0	160,600	160,600	Sept.
0	50,000	50,000	0	50,000	50,000	Oct.
0	0	0	0	0	0	Nov
0	0	0	0	0	0	Dec.
0	166,300	166,300	0	161,600	161,600	Total or average
						1903
0	63,000	63,000	0	178,800	178,800	Jan.
0	265,500	265,500	0	237,600	237,600	Feb.
0	280,000	280,000	0	252,000	252,000	Mar.
0	266,400	266,400	0	253,900	253,900	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	242,700	242,700	0	242,700	242,700	Aug.
0	131,700	131,700	0	131,700	131,700	Sept.
0	38,300	38,300	0	38,300	38,300	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	176,700	176,700	0	181,000	181,000	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1904									
Jan.	97,400	80,000	177,400	97,400	94,500	191,900	94,100	82,300	176,400
Feb.	98,400	92,400	190,800	98,400	70,500	168,900	95,100	89,400	184,500
Mar.	104,200	105,800	210,000	104,200	105,800	210,000	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	84,000	189,300
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	85,800	210,000	124,200	85,800	210,000	119,700	90,300	210,000
July	125,400	84,600	210,000	125,400	84,600	210,000	121,100	88,900	210,000
Aug.	126,700	54,600	181,300	126,700	54,600	181,300	122,300	87,700	210,000
Sept.	120,000	48,300	168,300	120,000	48,300	168,300	115,800	74,600	190,400
Oct.	113,400	81,900	195,300	113,400	81,900	195,300	109,500	100,500	210,000
Nov.	110,300	99,700	210,000	110,300	99,700	210,000	106,500	101,500	208,000
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	101,500	207,100
Total or average	113,000	85,600	198,600	113,000	85,100	198,100	109,100	92,300	201,400
1905									
Jan.	97,400	36,300	133,700	97,400	72,600	170,000	94,100	63,600	157,700
Feb.	101,900	108,100	210,000	101,900	103,600	205,500	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	98,400	202,600	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	45,600	150,900
May	117,500	87,600	205,100	117,500	87,600	205,100	113,300	88,200	201,500
June	124,200	56,100	180,300	124,200	56,100	180,300	119,700	73,800	193,500
July	125,400	35,500	160,900	125,400	35,500	160,900	121,100	34,900	156,000
Aug.	126,700	29,200	155,900	126,700	29,200	155,900	122,300	28,800	151,100
Sept.	120,000	21,700	141,700	120,000	21,700	141,700	115,800	21,400	137,200
Oct.	113,400	13,800	127,200	113,400	13,800	127,200	109,500	13,700	123,200
Nov.	110,300	21,900	132,200	110,300	21,900	132,200	106,500	21,800	128,300
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	25,500	131,100
Total or average	113,400	51,000	164,400	113,400	53,100	166,500	109,400	52,800	162,200
1906									
Jan.	97,400	0	97,400	97,400	21,600	119,000	94,100	44,400	138,500
Feb.	101,900	64,700	166,600	101,900	63,700	165,600	98,500	95,800	194,300
Mar.	104,200	105,800	210,000	104,200	98,900	203,100	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	61,500	166,800
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	85,800	210,000	124,200	85,800	210,000	119,700	90,300	210,000
July	125,400	84,600	210,000	125,400	84,600	210,000	121,100	88,900	210,000
Aug.	126,700	61,700	188,400	126,700	61,700	188,400	122,300	87,700	210,000
Sept.	120,000	37,800	157,800	120,000	37,800	157,800	115,800	72,200	188,000
Oct.	113,400	26,100	139,500	113,400	26,100	139,500	109,500	25,700	135,200
Nov.	110,300	32,800	143,100	110,300	32,800	143,100	106,500	32,900	139,400
Dec.	109,400	74,300	183,700	109,400	74,300	183,700	105,600	84,700	190,300
Total or average	113,400	63,900	177,300	113,400	65,100	178,500	109,400	74,100	183,500
1907									
Jan.	97,400	18,500	115,900	97,400	100,300	197,700	94,100	100,900	195,000
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	105,800	210,000	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	84,000	189,300
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	78,200	202,400	124,200	78,200	202,400	119,700	90,300	210,000
July	125,400	62,600	188,000	125,400	62,600	188,000	121,100	88,900	210,000
Aug.	126,700	52,000	178,700	126,700	52,000	178,700	122,300	83,600	205,900
Sept.	120,000	40,300	160,300	120,000	40,300	160,300	115,800	39,300	155,100
Oct.	113,400	30,100	143,500	113,400	30,100	143,500	109,500	29,700	139,200
Nov.	110,300	33,300	143,600	110,300	33,300	143,600	106,500	32,900	139,400
Dec.	109,400	55,100	164,500	109,400	55,100	164,500	105,600	76,200	181,800
Total or average	113,400	64,500	177,900	113,400	71,400	184,800	109,400	78,500	187,900

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1904
0	0	0	0	0	0	Jan.
0	125,100	125,100	0	155,300	155,300	Feb.
0	280,000	280,000	0	280,000	280,000	Mar.
0	280,000	280,000	0	280,000	280,000	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	178,300	178,300	0	178,300	178,300	Sept.
0	58,600	58,600	0	58,600	58,600	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	170,200	170,200	0	172,600	172,600	Total or average
						1905
0	132,100	132,100	0	222,700	222,700	Jan.
0	278,300	278,300	0	268,600	268,600	Feb.
0	273,500	273,500	0	250,900	250,900	Mar.
0	270,800	270,800	0	270,800	270,800	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	270,200	270,200	0	270,200	270,200	Aug.
0	153,800	153,800	0	153,800	153,800	Sept.
0	47,600	47,600	0	47,600	47,600	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	188,300	188,300	0	193,300	193,300	Total or average
						1906
0	0	0	0	0	0	Jan.
0	0	0	0	53,300	53,300	Feb.
0	280,000	280,000	0	257,900	257,900	Mar.
0	280,000	280,000	0	280,000	280,000	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	186,000	186,000	0	186,000	186,000	Sept.
0	59,300	59,300	0	59,300	59,300	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
	161,500	161,500	0	163,700	163,700	Total or average
0						**1907**
0	59,100	59,100	0	219,600	219,600	Jan.
0	280,000	280,000	0	280,000	280,000	Feb.
0	280,000	280,000	0	278,600	278,600	Mar.
0	280,000	280,000	0	280,000	280,000	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	169,700	169,700	0	169,700	169,700	Sept.
0	53,900	53,900	0	53,900	53,900	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	186,200	186,200	0	199,700	199,700	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1908									
Jan.	97,400	20,200	117,600	97,400	38,300	135,700	94,100	48,500	142,600
Feb.	98,400	111,600	210,000	98,400	90,800	189,200	95,100	111,600	206,700
Mar.	104,200	105,800	210,000	104,200	36,300	140,500	100,500	109,400	209,900
April	109,000	98,100	207,100	109,000	58 300	167,300	105,300	20,700	126,000
May	117,500	79,600	197,100	117,500	79,600	197,100	113,300	59,000	172,300
June	124,200	45,100	169,300	124,200	45,100	169,300	119,700	45,100	164,800
July	125,400	31,600	157,000	125,400	31,600	157,000	121,100	31,200	152,300
Aug.	126,700	26,200	152,900	126,700	26,200	152,900	122,300	25,900	148,200
Sept.	120,000	20,400	140,400	120,000	20,400	140,400	115,800	20,100	135,900
Oct.	113,400	19,500	132,900	113,400	19,500	132,900	109,500	19,200	128,700
Nov.	110,300	33,800	144,100	110,300	33,800	144,100	106,500	33,300	139,800
Dec.	109,400	5,900	115,300	109,400	5,900	115,300	105,600	32,300	137,900
Total or average	113,000	49,500	162,500	113,000	40,200	153,200	109,100	46,200	155,300
1909									
Jan.	97,400	76,200	173,600	97,400	87,100	184,500	94,100	89,700	183,800
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar	104,200	105,800	210,000	104,200	81,700	185,900	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	100,100	209,100	105,300	52,500	157,800
May	117,500	91,500	209,000	117,500	91,500	209,000	113,300	96,700	210,000
June	124,200	74,900	199,100	124,200	74,900	199,100	119,700	90,300	210,000
July	125,400	51,700	177,100	125,400	51,700	177,100	121,100	70,800	191,900
Aug.	126,700	40,900	167,600	126,700	40,900	167,600	122,300	40,300	162,600
Sept.	120,000	37,800	157,800	120,000	37,800	157,800	115,800	36,800	152,600
Oct.	113,400	39,400	152,800	113,400	39,400	152,800	109,500	38,400	147,900
Nov.	110,300	72,500	182,800	110,300	72,500	182,800	106,500	73,600	180,100
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	104,400	210,000
Total or average	113,400	74,800	188,200	113,400	73,600	187,000	109,400	76,100	185,500
1910									
Jan.	97,400	29,000	126,400	97,400	57,000	154,400	94,100	93,800	187,900
Feb.	101,900	108,100	210,000	101,900	62,900	164,800	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	100,400	204,600	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	38,800	144,100
May	117,500	54,400	171,900	117,500	54,400	171,900	113,300	39,400	152,700
June	124,200	20,100	144,300	124,200	20,100	144,300	119,700	20,400	140,100
July	125,400	29,400	154,800	125,400	29,400	154,800	121,100	29,200	150,300
Aug.	126,700	29,200	155,900	126,700	29,200	155,900	122,300	28,800	151,100
Sept.	120,000	24,200	144,200	120,000	24,200	144,200	115,800	23,900	139,700
Oct.	113,400	17,900	131,300	113,400	17,900	131,300	109,500	17,700	127,200
Nov.	110,300	40,300	150,600	110,300	40,300	150,600	106,500	40,300	146,800
Dec.	109,400	73,400	182,800	109,400	73,000	182,400	105,600	98,500	204,100
Total or average	113,400	52,300	165,700	113,400	50,800	164,200	109,400	54,100	163,500
1911									
Jan.	97,400	0	97,400	97,400	7,300	104,700	94,100	3,800	97,900
Feb.	101,900	88,100	190,000	101,900	75,000	176,900	98,500	111,500	210.000
Mar.	104,200	104,400	208,600	104,200	100,900	205,100	100,500	107,700	208,200
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	70,000	175,300
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	79,600	203,800	124,200	79,600	203,800	119,700	90,300	210,000
July	125,400	42,900	168,300	125,400	42,900	168,300	121,100	88,900	210,000
Aug.	126,700	32,500	159,200	126,700	32,500	159,200	122,300	43,500	165,800
Sept.	120,000	30,700	150,700	120,000	30,700	150,700	115,800	30,600	146,400
Oct.	113,400	24,100	137,500	113,400	24.100	137,500	109,500	23,700	133,200
Nov.	110,300	26,900	137,200	110,300	26,900	137,200	106,500	26,700	133,200
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	23,300	128,900
Total or average	113,400	51,500	164,900	113,400	50,800	164,200	109,400	59,300	168,700

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1908
0	0	0	0	18,100	18,100	Jan.
0	213,100	213,100	0	232,200	232,200	Feb.
0	264,300	264,300	0	128,900	128,900	Mar.
0	227,900	227,900	0	207,800	207,800	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	258,500	258,500	0	258,500	258,500	Aug.
0	146,000	146,000	0	146,000	146,000	Sept.
0	44,800	44,800	0	44,800	44,800	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	166,000	166,000	0	155,900	155,900	Total or average
						1909
0	117,100	117,100	0	128,600	128,600	Jan.
0	280,000	280,000	0	280,000	280,000	Feb.
0	280,000	280,000	0	225,800	225,800	Mar.
0	280,000	280,000	0	275,300	275,300	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	163,100	163,100	0	163,100	163,100	Sept.
0	51,700	51,700	0	51,700	51,700	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	190,400	190,400	0	186,400	186,400	Total or average
						1910
0	0	0	0	63,200	63,200	Jan.
0	257,400	257,400	0	190,300	190,300	Feb.
0	280,000	280,000	0	265,700	265,700	Mar.
0	264,900	264,900	0	264,900	264,900	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	242,600	242,600	0	242,600	242,600	Aug.
0	135,400	135,400	0	135,400	135,400	Sept.
0	41,000	41,000	0	41,000	41,000	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	171,100	171,100	0	170,100	170,100	Total or average
						1911
0	0	0	0	0	0	Jan.
0	0	0	0	75,600	75,600	Feb.
0	237,000	237,000	0	263,200	263,200	Mar.
0	280,000	280,000	0	278,300	278,300	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	165,600	165,600	0	165,600	165,600	Sept.
0	52,300	52,300	0	52,300	52,300	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	155,500	155,500	0	163,400	163,400	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1912									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	98,400	0	98,400	98,400	0	98,400	95,100	17,700	112,800
Mar.	104,200	50,300	154,500	104,200	50,300	154,500	100,500	109,500	210,000
April	109,000	80,000	189,000	109,000	80,000	189,000	105,300	15,400	120,700
May	117,500	91,900	209,400	117,500	91,900	209,400	113,300	87,100	200,400
June	124,200	69,000	193,200	124,200	69,000	193,200	119,700	90,300	210,000
July	125,400	37,500	162,900	125,400	37,500	162,900	121,100	76,300	197,400
Aug	126,700	30,000	156,700	126,700	30,000	156,700	122,300	29,600	151,900
Sept.	120,000	36,000	156,000	120,000	36,000	156,000	115,800	35,100	150,900
Oct.	113,400	15,900	129,300	113,400	15,900	129,300	109,500	15,600	125,100
Nov.	110,300	87,100	197,400	110,300	87,100	197,400	106,500	90,100	196,600
Dec.	109,400	64,500	173,900	109,400	64,500	173,900	105,600	85,800	191,400
Total or average	113,000	46,900	159,900	113,000	46,900	159,900	109,100	54,500	163,600
1913									
Jan.	97,400	0	97,400	97,400	45,000	142,400	94,100	39,800	133,900
Feb.	101,900	6,400	108,300	101,900	7,600	109,500	98,500	76,370	174,800
Mar.	104,200	76,200	180,400	104,200	0	104,200	100,500	80,100	180,600
April	109,000	101,000	210,000	109,000	87,600	196,600	105,300	41,100	146,400
May	117,500	85,500	203,000	117,500	85,500	203,000	113,300	89,000	202,300
June	124,200	36,800	161,000	124,200	36,800	161,000	119,700	36,800	156,500
July	125,400	32,800	158,200	125,400	32,800	158,200	121,100	32,900	154,000
Aug.	126,700	27,600	154,300	126,700	27,600	154,300	122,300	27,200	149,500
Sept.	120,000	14,000	134,000	120,000	14,000	134,000	115,800	13,900	129,700
Oct.	113,400	6,000	119,400	113,400	6,000	119,400	109,500	6,000	115,500
Nov.	110,300	43,600	153,900	110,300	43,600	153,900	106,500	43,800	150,300
Dec.	109,400	72,900	182,300	109,400	72,900	182,300	105,600	90,500	196,100
Total or average	113,400	42,100	155,500	113,400	38,500	151,900	109,400	48,000	157,400
1914									
Jan.	97,400	105,500	202,900	97,400	105,200	202,600	94,100	115,900	210,000
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	99,600	203,800	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	100,700	209,700	105,300	81,800	187,100
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	85,800	210,000	124,200	85,800	210,000	119,700	90,300	210,000
July	125,400	54,800	180,200	125,400	54,800	180,200	121,100	88,900	210,000
Aug.	126,700	34,100	160,800	126,700	34,100	160,800	122,300	68,400	190,700
Sept.	120,000	28,800	148,800	120,000	28,800	148,800	115,800	28,500	144,300
Oct.	113,400	33,200	146,600	113,400	33,200	146,600	109,500	32,900	142,400
Nov.	110,300	31,100	141,400	110,300	31,100	141,400	106,500	31,300	137,800
Dec.	109,400	37,900	147,300	109,400	37,900	147,300	105,600	63,700	169,300
Total or average	113,400	68,000	181,400	113,400	67,400	180,800	109,400	76,500	185,900
1915									
Jan.	97,400	0	97,400	97,400	40,900	138,300	94,100	14,900	109,000
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	105,800	210,000	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	101,000	210,000	105,300	76,800	182,100
May	117,500	92,500	210,000	117,500	92,500	210,000	113,300	96,700	210,000
June	124,200	85,800	210,000	124,200	85,800	210,000	119,700	90,300	210,000
July	125,400	83,900	209,300	125,400	83,900	209,300	121,100	88,900	210,000
Aug.	126,700	41,700	168,400	126,700	41,700	168,400	122,300	87,700	210,000
Sept.	120,000	24,700	144,700	120,000	24,700	144,700	115,800	44,900	160,700
Oct.	113,400	18,700	132,100	113,400	18,700	132,100	109,500	18,400	127,900
Nov.	110,300	32,400	142,700	110,300	32,400	142,700	106,500	32,100	138,600
Dec.	109,400	94,900	204,300	109,400	94,900	204,300	105,600	100,100	205,700
Total or average	113,400	65,500	178,900	113,400	69,000	182,400	109,400	72,400	181,800

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1912
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	23,000	23,000	0	23,000	23,000	Mar.
0	199,900	199,900	0	199,900	199,900	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	163,600	163,600	0	163,600	163,600	Sept.
0	51,500	51,500	0	51,500	51,500	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	130,200	130,200	0	130,200	130,200	Total or average
						1913
0	0	0	0	0	0	Jan.
0	0	0	0	62,500	62,500	Feb.
0	150,400	150,400	0	91,500	91,500	Mar.
0	274,300	274,300	0	274,300	274,300	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	260,400	260,400	0	260,400	260,400	Aug.
0	146,500	146,500	0	146,500	146,500	Sept.
0	44,500	44,500	0	44,500	44,500	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	143,800	143,800	0	143,600	143,600	Total or average
						1914
0	144,100	144,100	0	171,100	171,100	Jan.
0	275,700	275,700	0	280,000	280,000	Feb.
0	280,000	280,000	0	255,800	255,800	Mar.
0	278,600	278,600	0	273,200	273,200	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	168,300	168,300	0	168,300	168,300	Sept.
0	53,400	53,400	0	53,400	53,400	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	192,800	192,800	0	192,900	192,900	Total or average
						1915
0	0	0	0	9,000	9,000	Jan.
0	269,200	269,200	0	278,100	278,100	Feb.
0	280,000	280,000	0	271,900	271,900	Mar.
0	280,000	280,000	0	280,000	280,000	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	280,000	280,000	0	280,000	280,000	Aug.
0	177,500	177,500	0	177,500	177,500	Sept.
0	56,000	56,000	0	56,000	56,000	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	181,100	181,100	0	181,900	181,900	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor—0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1916									
Jan.	97,400	32,700	130,100	97,400	90,700	188,100	94,100	85,900	180,000
Feb.	98,400	111,600	210,000	98,400	107,900	206,300	95,100	111,600	206,700
Mar.	104,200	105,800	210,000	104,200	97,000	201,200	100,500	109,500	210,000
April	109,000	100,300	209,300	109,000	92,400	201,400	105,300	41,900	147,200
May	117,500	73,500	191,000	117,500	73,500	191,000	113,300	73,400	186,700
June	124,200	50,800	175,000	124,200	50,800	175,000	119,700	50,700	170,400
July	125,400	55,200	180,600	125,400	55,200	180,600	121,100	54,600	175,700
Aug.	126,700	32,500	159,200	126,700	32,500	159,200	122,300	32,000	154,300
Sept.	120,000	23,800	143,800	120,000	23,800	143,800	115,800	23,500	139,300
Oct.	113,400	19,900	133,300	113,400	19,900	133,300	109,500	19,600	129,100
Nov.	110,300	27,500	137,800	110,300	27,500	137,800	106,500	27,100	133,600
Dec.	109,400	44,500	153,900	109,400	44,500	153,900	105,600	70,000	175,600
Total or average	113,000	56,300	169,300	113,000	59,500	172,500	109,100	58,300	167,400
1917									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	11,600	113,500	98,500	11,900	110,400
Mar.	104,200	53,500	157,700	104,200	3,500	107,700	100,500	87,500	188,000
April	109,000	101,000	210,000	109,000	85,600	194,600	105,300	73,500	178,800
May	117,500	89,000	206,500	117,500	89,000	206,500	113,300	96,700	210,000
June	124,200	40,300	164,500	124,200	40,300	164,500	119,700	90,300	210,000
July	125,400	22,700	148,100	125,400	22,700	148,100	121,100	37,500	158,600
Aug.	126,700	20,400	147,100	126,700	20,400	147,100	122,300	19,800	142,100
Sept.	120,000	11,900	131,900	120,000	11,900	151,900	115,800	11,700	127,500
Oct.	113,400	5,400	118,800	113,400	5,400	118,800	109,500	5,200	114,700
Nov.	110,300	20,000	130,300	110,300	20,000	130,300	106,500	19,700	126,200
Dec.	109,400	18,400	127,800	109,400	18,400	127,800	105,600	44,400	150,000
Total or average	113,400	32,000	145,400	113,400	27,400	140,800	109,400	41,700	151,100
1918									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	0	101,900	98,500	0	98,500
Mar.	104,200	3,400	107,600	104,200	3,400	107,600	100,500	42,500	143,000
April	109,000	91,100	200,100	109,000	91,100	200,100	105,300	24,400	129,700
May	117,500	12,000	129,500	117,500	12,000	129,500	113,300	0	113,300
June	124,200	0	124,200	124,200	0	124,200	119,700	0	119,700
July	125,400	5,100	130,500	125,400	5,100	130,500	121,100	0	121,100
Aug.	126,700	11,200	137,900	126,700	11,200	137,900	122,300	1,200	125,500
Sept.	120,000	12,400	132,400	120,000	12,400	132,400	115,800	12,200	128,000
Oct.	113,400	28,900	142,300	113,400	28,900	142,300	109,500	28,500	138,000
Nov.	110,300	29,000	139,300	110,300	29,000	139,300	106,500	28,800	135,300
Dec.	109,400	3,600	113,000	109,400	3,600	113,000	105,600	28,800	134,400
Total or average	113,400	16,300	129,700	113,400	16,300	129,700	109,400	14,000	123,400
1919									
Jan.	97,400	0	97,400	97,400	29,000	126,400	94,100	0	94,100
Feb.	101,900	69,300	171,200	101,900	99,600	201,500	98,500	83,800	182,300
Mar.	104,200	105,800	210,000	104,200	95,200	199,400	100,500	109,500	210,000
April	109,000	101,000	210,000	109,000	97,600	206,600	105,300	46,400	151,700
May	117,500	64,100	181,600	117,500	64,100	181,600	113,300	60,500	173,800
June	124,200	7,100	131,300	124,200	7,100	131,300	119,700	7,400	127,100
July	125,400	14,800	140,200	125,400	14,800	140,200	121,100	14,700	135,800
Aug.	126,700	14,200	140,900	126,700	14,200	140,900	122,300	14,400	136,700
Sept.	120,000	4,600	124,600	120,000	4,600	124,600	115,800	4,600	120,400
Oct.	113,400	6,500	119,900	113,400	6,500	119,900	109,500	6,500	116,000
Nov.	110,300	4,200	114,500	110,300	4,200	114,500	106,500	4,200	110,700
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	0	105,600
Total or average	113,400	32,400	145,800	113,400	36,000	149,400	109,400	29,000	138,400

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation. Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights). Average power yield in kilowatts (Load factor=1.00)						
Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1916
0	72,000	72,000	0	160,900	160,900	Jan.
0	277,900	277,900	0	278,500	278,500	Feb.
0	280,000	280,000	0	254,300	254,300	Mar.
0	269,200	269,200	0	251,100	251,100	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	266,900	266,900	0	266,900	266,900	Aug.
0	151,800	151,800	0	151,800	151,800	Sept.
0	47,000	47,000	0	47,000	47,000	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	183,300	183,300	0	187,200	187,200	Total or average
						1917
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	17,900	17,900	0	17,900	17,900	Mar.
0	234,400	234,400	0	234,400	234,400	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	263,400	263,400	0	263,400	263,400	Aug.
0	147,600	147,600	0	147,600	147,600	Sept.
0	44,600	44,600	0	44,600	44,600	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	129,700	129,700	0	129,700	129,700	Total or average
						1918
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	16,900	16,900	0	16,900	16,900	Mar.
0	92,500	92,500	0	92,500	92,500	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	197,400	197,400	0	197,400	197,400	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	96,400	96,400	0	96,400	96,400	Total or average
						1919
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	143,100	143,100	0	209,800	209,800	Mar.
0	274,300	274,300	0	258,600	258,600	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	235,500	235,500	0	235,500	235,500	Aug.
0	124,600	124,600	0	124,600	124,600	Sept.
0	35,600	35,600	0	35,600	35,600	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	138,500	138,500	0	142,900	142,900	Total or average

TABLE 5a (Continued). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor=0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1920									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	98,400	0	98,400	98,400	0	98,400	95,100	0	95,100
Mar.	104,200	0	104,200	104,200	0	104,200	100,500	0	100,500
April	109,000	0	109,000	109,000	0	109,000	105,300	0	105,300
May	117,500	0	117,500	117,500	0	117,500	113,300	0	113,300
June	124,200	0	124,200	124,200	0	124,200	119,700	0	119,700
July	125,400	0	125,400	125,400	0	125,400	121,100	0	121,100
Aug.	126,700	0	126,700	126,700	0	126,700	122,300	0	122,300
Sept.	120,000	0	120,000	120,000	0	120,000	115,800	0	115,800
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	0	109,500
Nov.	110,300	10,400	120,700	110,300	10,400	120,700	106,500	0	106,500
Dec.	109,400	100,600	210,000	109,400	100,600	210,000	105,600	77,300	182,900
Total or average	113,000	9,400	122,400	113,000	9,400	122,400	109,100	6,500	115,600
1921									
Jan.	97,400	112,600	210,000	97,400	112,600	210,000	94,100	115,900	210,000
Feb.	101,900	108,100	210,000	101,900	108,100	210,000	98,500	111,500	210,000
Mar.	104,200	105,800	210,000	104,200	100,900	205,100	100,500	109,500	210,000
April	109,000	99,000	208,000	109,000	71,000	180,900	105,300	24,400	129,700
May	117,500	83,200	200,700	117,500	83,200	200,700	113,300	51,100	164,400
June	124,200	34,600	158,800	124,200	34,600	158,800	119,700	34,700	154,400
July	125,400	15,200	140,600	125,400	15,200	140,600	121,100	15,100	136,200
Aug.	126,700	11,200	137,900	126,700	11,200	137,900	122,300	11,600	133,900
Sept.	120,000	7,800	127,800	120,000	7,800	127,800	115,800	7,500	123,300
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	3,600	113,100
Nov.	110,300	16,300	126,600	110,300	16,300	126,600	106,500	11,900	118,400
Dec.	109,400	28,900	138,300	109,400	28,900	138,300	105,600	47,200	152,800
Total or average	113,400	51,600	165,000	113,400	48,900	162,300	109,400	45,100	154,500
1922									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	19,900	121,800	98,500	28,000	126,500
Mar.	104,200	60,100	164,300	104,200	7,300	111,500	100,500	97,300	197,800
April	109,000	93,600	202,600	109,000	93,600	202,600	105,300	24,400	129,700
May	117,500	88,300	205,800	117,500	88,300	205,800	113,300	74,900	188,200
June	124,200	35,000	159,200	124,200	35,000	159,200	119,700	50,300	170,000
July	125,400	7,900	133,300	125,400	7,900	133,300	121,100	7,900	129,000
Aug.	126,700	7,100	133,800	126,700	7,100	133,800	122,300	7,400	129,700
Sept.	120,000	1,700	121,700	120,000	1,700	121,700	115,800	1,700	117,500
Oct.	113,400	8,600	122,000	113,400	8 600	122,000	109,500	8,500	118,000
Nov.	110,300	28,300	138,600	110,300	28,300	138,600	106,500	27,900	134,400
Dec.	109,400	55,100	164,500	109,400	55,100	164,500	105,600	76,900	182,500
Total or average	113,400	32,300	145,700	113,400	29,400	142,800	109,400	33,900	143,300
1923									
Jan.	97,400	52,400	149,800	97,400	52,400	149,800	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	0	101,900	98,500	0	98,500
Mar.	104,200	0	104,200	104,200	0	104,200	100,500	9,000	109,500
April	109,000	0	109,000	109,000	0	109,000	105,300	20,600	125,900
May	117,500	1,300	118,800	117,500	1,300	118,800	113,300	0	113,300
June	124,200	0	124,200	124,200	0	124,200	119,700	0	119,700
July	125,400	0	125,400	125,400	0	125,400	121,100	0	121,100
Aug.	126,700	0	126,700	126,700	0	126,700	122,300	0	122,300
Sept.	120,000	0	120,000	120,000	0	120,000	115,800	0	115,800
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	0	109,500
Nov.	110,300	0	110,300	110,300	0	110,300	106,500	0	106,500
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	0	105,600
Total or average	113,400	4,600	118,000	113,400	4,600	118,000	109,400	2,500	111,900

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1920
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	14,500	14,500	0	14,500	14,500	Mar.
0	80,100	80,100	0	80,100	80,100	April
0	243,300	243,300	0	243,300	243,300	May
0	233,300	233,300	0	233,300	233,300	June
0	69,100	69,100	0	69,100	69,100	July
0	0	0	0	0	0	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	53,400	53,400	0	53,400	53,400	Total or average
						1921
0	67,700	67,700	0	134,700	134,700	Jan.
0	280,000	280,000	0	280,000	280,000	Feb.
0	280,000	280,000	0	280,000	280,000	Mar.
0	236,500	236,500	0	190,600	190,600	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	249,200	249,200	0	249,200	249,200	Aug.
0	136,300	136,300	0	136,300	136,300	Sept.
0	40,100	40,100	0	40,100	40,100	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	176,800	176,800	0	178,700	178,700	Total or average
						1922
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	17,300	17,300	0	17,300	17,300	Mar.
0	95,600	95,600	0	95,600	95,600	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	255,400	255,400	0	255,400	255,400	Aug.
0	140,400	140,400	0	140,400	140,400	Sept.
0	41,800	41,800	0	41,800	41,800	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	116,700	116,700	0	116,700	116,700	Total or average
						1923
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	16,900	16,900	0	16,900	16,900	Mar.
0	90,700	90,700	0	90,700	90,700	April
0	278,600	278,600	0	278,600	278,600	May
0	280,000	280,000	0	280,000	280,000	June
0	264,300	264,300	0	264,300	264,300	July
0	154,200	154,200	0	154,200	154,200	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	91,100	91,100	0	91,100	91,100	Total or average

TABLE 5a (Concluded). KENNETT

SUMMARY OF POWER YIELD BY MONTHS

Summary of Tables

(For corresponding yearly sum

Height of dam 420 feet. Capacity of reservoir 2,940,000 acre-feet.

Year and month	Operating primarily for power generation with incidental irrigation. Average power yield in kilowatts (Load factor—0.75)								
	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			With flood control, holding maximum reservoir space required (454,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Red Bluff 125,000 sec.-ft.		
	*Primary	Secondary	Total	*Primary	Secondary	Total	*Primary	Secondary	Total
1924									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	98,400	0	98,400	98,400	0	98,400	95,100	0	95,100
Mar.	104,200	0	104,200	104,200	0	104,200	100,500	0	100,500
April	109,000	0	109,000	109,000	0	109,000	105,300	0	105,300
May	117,500	0	117,500	117,500	0	117,500	113,300	0	113,300
June	124,200	0	124,200	124,200	0	124,200	119,700	0	119,700
July	125,400	0	125,400	125,400	0	125,400	121,100	0	121,100
Aug.	126,700	0	126,700	126,700	0	126,700	122,300	0	122,300
Sept.	120,000	0	120,000	120,000	0	120,000	115,800	0	115,800
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	0	109,500
Nov.	110,300	0	110,300	110,300	0	110,300	106,500	0	106,500
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	0	105,600
Total or average	113,000	0	113,000	113,000	0	113,000	109,100	0	109,100
1925									
Jan.	97,400	0	97,400	97,400	0	97,400	94,100	0	94,100
Feb.	101,900	0	101,900	101,900	0	101,900	98,500	0	98,500
Mar.	104,200	0	104,200	104,200	0	104,200	100,500	21,900	122,400
April	109,000	53,800	162,800	109,000	53,800	162,800	105,300	66,500	171,800
May	117,500	70,800	188,300	117,500	70,800	188,300	113,300	96,700	210,000
June	124,200	17,500	141,700	124,200	17,500	141,700	119,700	42,900	162,600
July	125,400	0	125,400	125,400	0	125,400	121,100	0	121,100
Aug.	126,700	0	126,700	126,700	0	126,700	122,300	0	122,300
Sept.	120,000	0	120,000	120,000	0	120,000	115,800	0	115,800
Oct.	113,400	0	113,400	113,400	0	113,400	109,500	0	109,500
Nov.	110,300	2,500	112,800	110,300	2,500	112,800	106,500	2,100	108,600
Dec.	109,400	0	109,400	109,400	0	109,400	105,600	19,600	125,200
Total or average	113,400	12,100	125,500	113,400	12,100	125,500	109,400	20,900	130,300
Average for 30-year period, 1896-1926	**113,400**	**44,800**	**158,200**	**113,400**	**43,400**	**156,800**	**109,400**	**47,300**	**156,700**

*Total primary power production in February of leap years taken the same as in other years.

RESERVOIR ON SACRAMENTO RIVER.

BOTH WITH AND WITHOUT FLOOD CONTROL.

1a, 2a and 4a.

mary, see Table 5, page 116.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Operating primarily for irrigation with incidental power generation
Seasonal irrigation yield 4,276,000 acre-feet. (Deficiency in supply one year in ten, no deduction for downstream prior rights).
Average power yield in kilowatts (Load factor=1.00)

Without flood control			Coordinated with flood control by reservoir operating diagram Maximum controlled flow at Red Bluff 125,000 sec.-ft. Maximum reservoir space required 454,000 acre-feet			Year and month
Primary	Secondary	Total	Primary	Secondary	Total	
						1924
0	0	0	0	0	0	Jan.
0	0	0	0	0	0	Feb.
0	13,400	13,400	0	13,400	13,400	Mar
0	70,700	70,700	0	70,700	70,700	April
0	191,400	191,400	0	191,400	191,400	May
0	30,000	30,000	0	30,000	30,000	June
0	0	0	0	0	0	July
0	0	0	0	0	0	Aug.
0	0	0	0	0	0	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	25,600	25,600	0	25,600	25,600	Total or average
						1925
0	0	0	0	0	0	Jan.
0	0	0	0	49,900	49,900	Feb.
0	143,800	143,800	0	98,800	98,800	Mar.
0	277,500	277,500	0	256,900	256,900	April
0	280,000	280,000	0	280,000	280,000	May
0	280,000	280,000	0	280,000	280,000	June
0	280,000	280,000	0	280,000	280,000	July
0	234,100	234,100	0	234,100	234,100	Aug.
0	122,400	122,400	0	122,400	122,400	Sept.
0	0	0	0	0	0	Oct.
0	0	0	0	0	0	Nov.
0	0	0	0	0	0	Dec.
0	135,500	135,500	0	133,900	133,900	Total or average
0	**145,300**	**145,300**	**0**	**145,600**	**145,600**	**Average for 30-year period, 1896-1926**

ASSUMPTIONS EMPLOYED IN COMPUTING WATER AND POWER YIELD OF PARDEE RESERVOIR ON MOKELUMNE RIVER ON DAILY BASIS.

1. Water supply at dam site is the same as that measured at the Clements gaging station of the United States Geological Survey and published, or in preparation for publication, as mean daily discharges in the Water Supply Papers. A deduction of 140,000 acre-feet per year is made for downstream prior rights in estimating the reservoir yield for domestic purposes. This water is utilized in the generation of power.

2. The reservoir is full on July 1, 1904, the opening date of computations. The run-off index for the season 1903–1904 is 108. The reservoir fills in 1925 with a run-off index of 92.

3. The net evaporation from the reservoir surface equals 2.67 feet depth per annum divided among the months as follows: (Taken from Annual Report of East Bay Municipal Utility District for 1925, p. 42.)

Evaporation and Rainfall at Lancha Plana Reservoir.

Quantities in inches depth.

Month	*Evaporation*	*Rainfall*	*Net loss*
October	3.90	1.18	2.72
November	1.70	2.64	– .94
December	.90	3.72	–2.82
January	.81	4.39	–3.58
February	1.26	3.48	–2.22
March	2.37	4.66	–2.29
April	4.04	2.06	1.98
May	6.81	1.15	5.66
June	8.00	.29	7.71
July	10.19	.00	10.19
August	9.07	.00	9.07
September	6.95	.43	6.52
Year	56.00	24.00	32.00

4. The municipal supply is drawn from the reservoir at a uniformly constant rate of 200,000,000 gallons per day.

5. Power is generated in a plant at the base of the dam with water passing by the dam for downstream prior rights, reservoir spill, and some water drawn from reservoir in addition to the municipal draft in accord with schedule of operation dated August 3, 1927, submitted by East Bay Municipal Utility District. Maximum flow through turbines 750 second-feet. Power is not generated from the municipal draft from the reservoir.

6. Capacity of power plant is 15,000 kilowatts.

7. Overall efficiency of power plant is 72.6 per cent for all reservoir levels.

8. Load factor on power plant 1.00.

9. The elevation of water in the tail race is 242.5 feet, constant for all discharges.

TABLE 6a. PARDEE RESERVOIR

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1905									
Jan.	26,320	145,860	19,030	10,500	+ 610	0	0	282	2,960
Feb.	47,370	143,260	17,190	22,500	+ 380	0	0	285	7,100
Mar.	86,700	151,320	19,030	46,120	+ 430	0	0	290	13,370
April	116,600	173,300	18,410	44,630	— 370	4,490	0	311	14,280
May	156,600	222,000	19,030	46,120	—1,070	90,380	0	325	15,000
June	99,070	222,000	18,410	40,910	—1,460	41,010	0	325	13,700
July	11,560	219,280	19,030	11,560	—1,930	0	0	319	3,680
Aug.	7,870	198,320	19,030	7,870	—1,550	0	0	308	2,430
Sept.	8,270	177,740	18,410	8,270	— 990	0	0	297	2,540
Oct.	7,010	158,340	19,030	3,000	— 390	0	0	287	860
Nov.	4,730	142,930	18,410	0	+ 120	0	0	...	0
Dec.	5,960	129,370	19,030	0	+ 360	0	0	...	0
Total or average	578,060		224,040	241,480	—5,860	135,880	0	303	6,320
1906									
Jan.	61,200	116,660	19,030	0	+ 420	0	0	...	0
Feb.	44,900	159,250	17,190	41,650	+ 320	0	0	283	13,050
Mar.	155,000	145,630	19,030	46,120	+ 370	13,850	0	296	13,680
April	175,000	222,000	18,410	44,630	— 370	111,590	0	325	15,000
May	289,000	222,000	19,030	46,120	—1,070	222,780	0	325	15,000
June	358,000	222,000	18,410	44,630	—1,460	293,500	0	325	15,000
July	218,000	222,000	19,030	44,610	—1,930	152,560	0	325	14,500
Aug.	21,900	221,870	19,030	31,900	—1,720	0	0	317	10,130
Sept.	12,000	191,120	18,410	11,600	—1,110	0	0	305	3,650
Oct.	11,700	172,000	19,030	6,500	— 410	0	0	296	1,920
Nov.	14,800	157,760	18,410	3,000	+ 140	0	0	289	900
Dec.	53,900	151,290	19,030	5,000	+ 420	0	0	292	1,470
Total or average	1,415,400		224,040	325,760	—6,400	794,280	0	307	8,650
1907									
Jan.	70,100	181,580	19,030	46,120	+ 630	0	0	304	14,010
Feb.	154,000	187,160	17,190	41,650	+ 420	60,740	0	323	14,930
Mar.	300,000	222,000	19,030	46,120	+ 430	235,280	0	325	15,000
April	264,000	222,000	18,410	44,630	— 370	200,590	0	325	15,000
May	259,000	222,000	19,030	46,120	—1,070	192,780	0	325	15,000
June	281,000	222,000	18,410	44,630	—1,460	216,500	0	325	15,000
July	205,000	222,000	19,030	46,120	—1,930	137,920	0	325	15,000
Aug.	43,200	222,000	19,030	31,290	—1,720	2,700	0	323	10,130
Sept.	15,300	210,460	18,410	30,500	—1,230	0	0	311	9,810
Oct.	17,000	175,620	19,030	9,500	— 490	0	0	299	2,840
Nov.	13,900	163,600	18,410	9,000	+ 160	0	0	290	2,710
Dec.	20,200	150,250	19,030	3,000	+ 480	0	0	286	860
Total or average	1,642,700		224,040	398,680	—6,150	1,046,510	0	313	10,820
1908									
Jan.	33,000	148,900	19,030	12,500	+ 610	0	0	286	3,580
Feb.	22,600	150,980	17,800	28,500	+ 400	0	0	279	8,510
Mar.	50,200	127,680	19,030	33,470	+ 430	0	0	302	10,030
April	103,000	125,810	18,410	44,630	— 370	0	0	277	12,780
May	117,000	165,400	19,030	46,120	—1,070	0	0	310	14,300
June	75,000	216,180	18,410	40,220	—1,460	10,770	0	325	13,500
July	14,100	220,320	19,030	14,100	—1,930	0	0	319	4,500
Aug.	6,400	199,360	19,030	6,400	—1,550	0	0	309	1,980
Sept.	8,030	178,780	18,410	8,030	— 990	0	0	297	2,470
Oct.	8,730	159,380	19,030	3,000	— 390	0	0	288	860
Nov.	7,380	145,690	18,410	0	+ 130	0	0	...	0
Dec.	9,900	134,790	19,030	0	+ 370	0	0	...	0
Total or average	455,340		224,650	236,970	—5,820	10,770	0	299	6,920

ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1905
145,860	19,030	10,500	+ 610	0	0	0	282	2,960	Jan.
143,260	17,190	22,500	+ 380	0	0	0	285	7,100	Feb.
151,320	19,030	46,120	+ 430	0	0	0	290	13,370	Mar.
173,300	18,410	44,630	— 370	0	4,490	0	311	14,380	April
222,000	19,030	46,200	—1,070	73,570	21,890	0	324	15,000	May
216,840	18,410	40,510	—1,460	38,270	0	0	323	13,540	June
217,260	19,030	11,560	—1,930	0	0	0	318	3,680	July
196,300	19,030	7,870	—1,550	0	0	0	307	2,420	Aug.
175,720	18,410	8,270	— 990	0	0	0	296	2,530	Sept.
156,320	19,030	3,000	— 390	0	0	0	285	860	Oct.
140,910	18,410	0	+ 120	0	0	0	...	0	Nov.
127,350	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	241,160	—5,860	111,840	26,380	0	302	6,300	Total or average
									1906
114,640	19,030	0	+ 420	0	0	0	...	0	Jan.
157,230	17,190	41,650	+ 320	0	0	0	282	13,020	Feb.
143,610	19,030	44,580	+ 370	63,140	0	0	289	12,880	Mar.
172,230	18,410	43,760	— 370	26,850	35,840	0	314	14,220	April
222,000	19,030	46,430	—1,070	137,510	96,860	0	323	15,000	May
210,100	18,410	45,110	—1,460	285,980	0	0	322	15,000	June
217,140	19,030	44,620	—1,930	48,070	99,620	0	325	14,500	July
221,870	19,030	31,900	—1,720	0	0	0	317	10,130	Aug.
191,120	18,410	11,600	—1,110	0	0	0	305	2,650	Sept.
172,000	19,030	6,500	— 410	0	0	0	296	1,920	Oct.
157,760	18,410	3,000	+ 140	0	0	0	289	900	Nov.
151,290	19,030	11,310	+ 420	9,600	0	0	292	3,370	Dec.
	224,040	330,460	—6,400	571,150	232,320	0	305	8,680	Total or average
									1907
165,670	19,030	49,580	+ 630	33,160	0	0	283	14,050	Jan.
134,630	17,190	49,240	+ 420	91,070	0	0	275	15,000	Feb.
131,550	19,030	51,000	+ 430	149,290	0	0	294	14,950	Mar.
212,660	18,410	45,470	— 370	128,450	61,960	0	319	15,000	April
222,000	19,030	46,120	—1,070	11,670	181,110	0	325	15,000	May
222,000	18,410	44,630	—1,460	107,620	108,880	0	325	15,000	June
222,000	19,030	46,120	—1,930	0	137,920	0	325	15,000	July
222,000	19,030	31,290	—1,720	0	2,700	0	323	10,130	Aug.
210,460	18,410	30,500	—1,230	0	0	0	311	9,810	Sept.
175,620	19,030	9,500	— 490	0	0	0	299	2,840	Oct.
163,600	18,410	9,000	+ 160	0	0	0	290	2,710	Nov.
150,250	19,030	3,000	+ 480	0	0	0	286	860	Dec.
	224,040	415,450	—6,150	521,260	492,570	0	305	10,820	Total or average
									1908
148,900	19,030	12,500	+ 610	0	0	0	286	3,580	Jan.
150,980	17,800	28,500	+ 400	0	0	0	279	8,510	Feb.
127,680	19,030	33,470	+ 430	0	0	0	302	10,090	Mar.
125,810	18,410	44,630	— 370	0	0	0	277	12,780	April
165,400	19,030	46,120	—1,070	0	0	0	310	14,300	May
216,180	18,410	40,220	—1,460	0	10,770	0	325	13,500	June
220,320	19,030	14,100	—1,930	0	0	0	319	4,500	July
199,360	19,030	6,400	—1,550	0	0	0	309	1,980	Aug.
178,780	18,410	8,030	— 990	0	0	0	297	2,470	Sept.
159,380	19,030	3,000	— 390	0	0	0	288	860	Oct.
145,690	18,410	0	+ 130	0	0	0	...	0	Nov.
134,790	19,030	0	+ 370	0	0	0	...	0	Dec.
	224,650	236,970	—5,820	0	10,770	0	299	6,020	Total or average

TABLE 6a (Continued). PARDEE RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor=1.00)
1909									
Jan.	179,000	126,030	19,030	17,330	+ 440	47,110	0	300	5,590
Feb.	126,000	222,000	17,190	41,650	+ 420	67,580	0	325	15,000
Mar.	103,000	222,000	19,030	46,120	+ 430	38,280	0	325	15,000
April	167,000	222,000	18,410	44,630	— 370	103,590	0	325	15,000
May	228,000	222,000	19,030	46,120	—1,070	161,780	0	325	15,000
June	256,000	222,000	18,410	44,630	—1,460	191,500	0	325	15,000
July	50,700	222,000	19,030	31,080	—1,930	8,950	0	324	10,080
Aug.	7,070	211,710	19,030	17,070	—1,720	0	0	313	5,350
Sept.	4,600	180,960	18,410	7,600	—1,110	0	0	298	2,350
Oct.	8,060	158,440	19,030	4,000	— 410	0	0	287	1,140
Nov.	56,600	143,060	18,410	0	+ 140	0	0	...	0
Dec.	92,200	181,390	19,030	46,120	+ 480	0	0	318	14,660
Total or average	1,278,230		224,040	346,350	—6,160	618,790	0	315	9,480
1910									
Jan.	82,400	208,920	19,030	46,120	+ 680	4,850	0	323	14,920
Feb.	52,600	222,000	17,190	41,650	+ 420	310	0	324	14,930
Mar.	147,000	215,870	19,030	46,120	+ 430	76,150	0	324	14,970
April	193,000	222,000	18,410	44,630	— 370	129,590	0	325	15,000
May	196,000	222,000	19,030	46,120	—1,070	129,780	0	325	15,000
June	59,500	222,000	18,410	33,210	—1,460	14,760	0	324	11,140
July	10,600	213,660	19,030	10,600	—1,930	0	0	316	3,360
Aug.	3,960	192,700	19,030	3,960	—1,550	0	0	306	1,210
Sept.	4,420	172,120	18,410	4,420	— 990	0	0	294	1,350
Oct.	6,580	152,720	19,030	3,000	— 390	0	0	283	850
Nov.	10,100	136,880	18,410	0	+ 120	0	0	...	0
Dec.	21,900	128,690	19,030	0	+ 370	0	0	...	0
Total or average	788,060		224,040	279,830	—5,740	355,440	0	314	7,670
1911									
Jan.	148,000	131,930	19,030	8,120	+ 470	31,250	0	286	2,430
Feb.	143,000	222,000	17,190	41,650	+ 420	84,580	0	325	15,000
Mar.	204,000	222,000	19,030	46,120	+ 430	139,280	0	325	15,000
April	256,000	222,000	18,410	44,630	— 370	192,590	0	325	15,000
May	262,000	222,000	19,030	46,120	—1,070	195,780	0	325	15,000
June	331,000	222,000	18,410	44,630	—1,460	266,500	0	325	15,000
July	117,000	222,000	19,030	40,400	—1,930	60,270	0	325	13,130
Aug.	16,500	217,370	19,030	26,500	—1,720	0	0	315	8,360
Sept.	9,280	186,620	18,410	11,500	—1,110	0	0	302	3,580
Oct.	8,790	164,880	19,030	4,000	— 410	0	0	290	1,170
Nov.	11,900	150,230	18,410	0	+ 140	0	0	...	0
Dec.	8,360	143,860	19,030	2,000	+ 400	0	0	278	550
Total or average	1,515,830		224,040	315,670	—6,210	970,250	0	311	8,630
1912									
Jan.	14,000	131,590	19,030	2,920	+ 490	0	0	272	790
Feb.	10,800	124,130	17,800	8,000	+ 300	0	0	263	2,260
Mar.	21,000	109,430	19,030	24,000	+ 290	0	0	249	5,980
April	30,800	87,690	18,410	34,000	— 230	0	0	229	8,040
May	140,000	65,850	19,030	31,000	— 600	0	0	247	7,650
June	125,000	155,220	18,410	33,020	—1,250	10,360	0	319	10,920
July	9,900	217,180	19,030	9,900	—1,930	0	0	318	3,150
Aug.	5,580	196,220	19,030	5,580	—1,550	0	0	307	1,720
Sept.	6,600	175,640	18,410	6,600	— 990	0	0	296	2,010
Oct.	5,260	156,240	19,030	3,000	— 390	0	0	285	860
Nov.	31,100	139,080	18,410	0	+ 120	0	0	...	0
Dec.	10,500	151,890	19,030	11,000	+ 400	0	0	281	3,090
Total or average	410,540		224,650	169,020	—5,340	10,360	0	279	3,870

VOIR ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1909
126,020	19,030	20,990	+ 440	105,260	0	0	294	6,530	Jan.
160,190	17,190	48,870	+ 420	87,310	0	0	277	15,000	Feb.
133,240	19,030	42,020	+ 430	13,700	0	0	282	11,770	Mar.
161,920	18,410	35,940	— 370	12,220	39,980	0	313	11,750	April
222,000	19,030	46,430	—1,070	99,300	74,470	0	323	15,000	May
209,700	18,410	45,270	—1,460	184,310	0	0	321	15,000	June
216,250	19,030	30,130	—1,930	4,150	0	0	324	9,770	July
211,710	19,030	17,070	—1,720	0	0	0	313	5,350	Aug.
180,960	18,410	7,600	—1,110	0	0	0	298	2,350	Sept.
158,440	19,030	4,000	— 410	0	0	0	287	1,140	Oct.
143,060	18,410	0	+ 140	0	0	0	...	0	Nov.
181,390	19,030	47,500	+ 480	46,730	0	0	312	14,800	Dec.
	224,040	345,820	—6,160	552,980	114,450	0	304	9,010	Total or average
									1910
160,810	19,030	45,580	+ 680	44,650	0	0	286	13,170	Jan.
134,630	17,190	32,330	+ 420	3,400	0	0	275	9,850	Feb.
134,730	19,030	47,610	+ 430	47,070	0	0	287	13,640	Mar.
168,450	18,410	42,440	— 370	22,560	55,670	0	315	13,860	April
222,000	19,030	46,380	—1,070	92,040	47,990	0	323	15,000	May
211,490	18,410	33,310	—1,460	14,690	0	0	319	10,920	June
203,120	19,030	10,600	—1,930	0	0	0	310	3,290	July
182,160	19,030	3,960	—1,550	0	0	0	299	1,180	Aug.
161,580	18,410	4,420	— 990	0	0	0	287	1,310	Sept.
142,180	19,030	3,000	— 390	0	0	0	276	820	Oct.
126,340	18,410	0	+ 120	0	0	0	...	0	Nov.
118,150	19,030	0	+ 370	0	0	0	...	0	Dec.
	224,040	269,630	—5,740	224,410	103,660	0	298	6,900	Total or average
									1911
121,390	19,030	18,120	+ 470	52,820	0	0	275	5,090	Jan.
179,890	17,190	47,070	+ 420	125,410	0	0	286	14,910	Feb.
133,640	19,030	52,540	+ 430	102,620	0	0	286	15,000	Mar.
163,880	18,410	46,240	— 370	78,010	54,850	0	314	15,000	April
222,000	19,030	46,160	—1,070	97,820	103,280	0	325	15,000	May
216,640	18,410	44,870	—1,460	262,490	0	0	323	15,000	June
220,410	19,030	40,400	—1,930	11,260	47,420	0	325	13,130	July
217,370	19,030	26,500	—1,720	0	0	0	315	8,360	Aug.
186,620	18,410	11,500	—1,110	0	0	0	302	3,580	Sept.
164,880	19,030	4,000	— 410	0	0	0	290	1,170	Oct.
150,230	18,410	0	+ 140	0	0	0	...	0	Nov.
143,860	19,030	2,000	+ 400	0	0	0	278	550	Dec.
	224,040	339,400	—6,210	730,430	205,550	0	302	8,850	Total or average
									1912
131,590	19,030	2,920	+ 490	0	0	0	272	790	Jan.
124,130	17,800	8,000	+ 300	0	0	0	263	2,260	Feb.
109,430	19,030	24,000	+ 290	0	0	0	249	5,980	Mar.
87,690	18,410	34,000	— 230	0	0	0	229	8,040	April
65,850	19,030	31,000	— 600	0	0	0	247	7,650	May
155,220	18,410	33,020	—1,250	0	10,360	0	319	10,920	June
217,180	19,030	9,900	—1,930	0	0	0	318	3,150	July
196,220	19,030	5,580	—1,550	0	0	0	307	1,720	Aug.
175,640	18,410	6,600	— 990	0	0	0	296	2,010	Sept.
156,240	19,030	3,000	— 390	0	0	0	285	860	Oct.
139,080	18,410	0	+ 120	0	0	0	...	0	Nov.
151,890	19,030	11,000	+ 400	0	0	0	281	3,090	Dec.
	224,650	169,020	—5,340	0	10,360	0	279	3,870	Total or average

TABLE 6a (Continued). PARDEE RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1913									
Jan.	22,600	132,760	19,030	2,500	+ 490	0	0	274	690
Feb.	19,800	134,320	17,190	18,500	+ 300	0	0	271	5,540
Mar.	21,600	118,730	19,030	34,770	+ 310	0	0	252	8,760
April	83,900	86,840	18,410	35,000	— 260	0	0	247	8,930
May	148,000	117,070	19,030	32,060	— 830	0	0	292	9,370
June	55,300	213,150	18,410	32,210	—1,460	3,280	0	324	10,790
July	10,500	213,090	19,030	10,500	—1,930	0	0	316	3,320
Aug.	8,360	192,130	19,030	8,360	—1,550	0	0	305	2,550
Sept.	6,370	171,550	18,410	6,370	— 990	0	0	293	1,930
Oct.	7,130	152,150	19,030	3,000	— 390	0	0	282	850
Nov.	8,090	136,860	18,410	0	+ 130	0	0	...	0
Dec.	14,300	126,670	19,030	0	+ 360	0	0	...	0
Total or average	405,950		224,040	183,270	—5,820	3,280	0	286	4,370
1914									
Jan.	169,000	122,300	19,030	10,140	+ 450	40,580	0	301	3,270
Feb.	102,000	222,000	17,190	41,650	+ 420	43,580	0	325	15,000
Mar.	105,000	222,000	19,030	46,120	+ 430	40,280	0	325	15,000
April	144,000	222,000	18,410	44,630	— 370	80,590	0	325	15,000
May	261,000	222,000	19,030	46,120	—1,070	194,780	0	325	15,000
June	198,000	222,000	18,410	44,630	—1,460	133,500	0	325	15,000
July	50,200	222,000	19,030	31,320	—1,930	8,010	0	324	10,160
Aug.	10,200	211,910	19,030	20,200	—1,720	0	0	313	6,330
Sept.	7,800	181,160	18,410	10,800	—1,110	0	0	298	3,330
Oct.	8,120	158,640	19,030	7,000	— 410	0	0	286	2,000
Nov.	7,970	140,320	18,410	0	+ 140	0	0	...	0
Dec.	12,600	130,020	19,030	0	+ 390	0	0	...	0
Total or average	1,075,890		224,040	302,610	—6,240	541,320	0	314	8,280
1915									
Jan.	19,600	123,980	19,030	1,500	+ 490	0	0	269	400
Feb.	75,000	123,540	17,190	13,500	+ 300	0	0	286	4,270
Mar.	61,400	168,150	19,030	46,120	+ 390	0	0	293	13,490
April	133,000	164,790	18,410	44,630	— 370	12,380	0	310	14,310
May	218,000	222,000	19,030	46,120	—1,070	151,780	0	325	15,000
June	231,000	222,000	18,410	44,630	—1,460	166,500	0	325	15,000
July	44,000	222,000	19,030	28,700	—1,930	5,800	0	324	9,300
Aug.	5,710	210,540	19,030	9,710	—1,630	0	0	314	3,050
Sept.	6,370	185,880	18,410	9,370	—1,050	0	0	300	2,920
Oct.	6,830	163,420	19,030	4,000	— 400	0	0	289	1,160
Nov.	8,690	146,820	18,410	0	+ 130	0	0	...	0
Dec.	19,800	137,230	19,030	0	+ 390	0	0	...	0
Total or average	829,400		224,040	248,280	—6,210	336,460	0	303	6,580
1916									
Jan.	79,300	138,390	19,030	6,500	+ 490	0	0	290	1,900
Feb.	97,800	192,650	17,800	43,140	+ 400	7,910	0	319	14,740
Mar.	175,000	222,000	19,030	46,120	+ 430	110,280	0	325	15,000
April	195,000	222,000	18,410	44,630	— 370	131,590	0	325	15,000
May	205,000	222,000	19,030	46,120	—1,070	138,780	0	325	15,000
June	181,000	222,000	18,410	44,630	—1,460	116,500	0	325	15,000
July	46,900	222,000	19,030	32,390	—1,930	3,800	0	324	10,500
Aug.	10,500	211,750	19,030	19,500	—1,720	0	0	313	6,100
Sept.	6,720	182,000	18,410	9,720	—1,110	0	0	299	3,000
Oct.	12,700	159,480	19,030	6,000	— 410	0	0	288	1,730
Nov.	11,800	146,740	18,410	4,000	+ 140	0	0	280	1,170
Dec.	27,600	136,270	19,030	1,000	+ 400	0	0	282	280
Total or average	1,049,320		224,650	303,750	—6,210	508,860	0	308	8,240

VOIR ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1913
132,760	19,030	2,500	+ 490	0	0	0	274	690	Jan.
134,320	17,190	18,500	+ 300	0	0	0	271	5,540	Feb.
118,730	19,030	34,770	+ 310	0	0	0	252	8,760	Mar.
86,840	18,410	35,000	— 260	0	0	0	247	8,930	April
117,070	19,030	32,060	— 830	0	0	0	292	9,370	May
213,150	18,410	32,210	—1,460	0	3,280	0	324	10,790	June
213,090	19,030	10,500	—1,930	0	0	0	316	3,320	July
192,130	19,030	8,360	—1,550	0	0	0	305	2,550	Aug.
171,550	18,410	6,370	— 990	0	0	0	293	1,930	Sept.
152,150	19,030	3,000	— 390	0	0	0	282	850	Oct.
136,860	18,410	0	+ 130	0	0	0	...	0	Nov.
126,670	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	183,270	—5,820	0	3,280	0	286	4,370	Total or average
									1914
122,300	19,030	39,510	+ 450	95,510	0	0	283	11,160	Jan.
137,700	17,190	42,430	+ 420	48,850	0	0	275	12,920	Feb.
131,650	19,030	45,680	+ 430	6,190	0	0	283	12,840	Mar.
166,180	18,410	39,980	— 370	17,370	12,050	0	314	13,060	April
222,000	19,030	46,430	—1,070	152,780	53,790	0	323	15,000	May
209,900	18,410	45,270	—1,460	126,510	0	0	320	15,000	June
216,250	19,030	30,790	—1,930	1,900	890	0	324	10,130	July
211,910	19,030	20,200	—1,720	0	0	0	313	6,330	Aug.
181,160	18,410	10,800	—1,110	0	0	0	298	3,330	Sept.
158,640	19,030	7,000	— 410	0	0	0	286	2,000	Oct.
140,320	18,410	0	+ 140	0	0	0	...	0	Nov.
130,020	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	328,090	—6,240	449,110	66,730	0	302	8,450	Total or average
									1915
123,980	19,030	1,500	+ 490	0	0	0	269	400	Jan.
123,540	17,190	22,210	+ 300	17,270	0	0	278	6,860	Feb.
142,170	19,030	18,950	+ 390	1,190	0	0	286	5,480	Mar.
164,790	18,410	44,630	— 370	12,380	0	0	310	14,310	April
222,000	19,030	46,410	—1,070	142,010	20,690	0	323	15,000	May
210,790	18,410	45,230	—1,460	159,450	0	0	321	15,000	June
217,240	19,030	28,130	—1,930	1,270	340	0	323	9,130	July
210,540	19,030	9,710	—1,630	0	0	0	314	3,050	Aug.
185,880	18,410	9,370	—1,050	0	0	0	300	2,920	Sept.
163,420	19,030	4,000	— 400	0	0	0	289	1,160	Oct.
146,820	18,410	0	+ 130	0	0	0	...	0	Nov.
137,230	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	230,140	—6,210	333,570	21,030	0	302	6,080	Total or average
									1916
138,390	19,030	30,450	+ 490	34,170	0	0	280	8,510	Jan.
134,530	17,890	49,270	+ 400	30,730	0	0	275	14,470	Feb.
134,930	19,030	52,940	+ 430	72,920	0	0	283	14,990	Mar.
165,470	18,410	44,740	— 370	21,790	53,160	0	314	14,510	April
222,000	19,030	46,420	—1,070	77,790	72,090	0	323	15,000	May
210,600	18,410	45,170	—1,460	109,520	0	0	321	14,970	June
217,040	19,030	30,370	—1,930	0	860	0	324	9,850	July
211,756	19,030	19,500	—1 720	0	0	0	313	6,100	Aug.
182,000	18,410	9,720	—1,110	0	0	0	299	3,000	Sept.
159,480	19,030	6,000	— 410	0	0	0	288	1,730	Oct.
146,740	18,410	4,000	+ 140	0	0	0	280	1,170	Nov.
136,270	19,030	1,000	+ 400	0	0	0	282	280	Dec.
	224,650	339,580	—6,210	346,920	126,110	0	298	8,690	Total or average

TABLE 6a (Continued). PARDEE RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1917									
Jan.	20,000	144,240	19,030	19,500	+ 530	0	0	276	5,390
Feb.	69,400	126,240	17,190	15,500	+ 330	0	0	270	4,640
Mar.	59,500	163,280	19,030	40,120	+ 430	0	0	291	13,430
April	134,000	158,060	18,410	44,630	— 370	6,650	0	306	14,100
May	207,000	222,000	19,030	46,120	—1,070	140,780	0	325	15,000
June	264,000	222,000	18,410	44,630	—1,460	199,500	0	325	15,000
July	47,000	222,000	19,030	29,530	—1,930	6,000	0	324	9,580
Aug.	9,350	212,510	19,030	16,350	—1,720	0	0	314	5,130
Sept.	5,680	184,760	18,410	8,680	—1,110	0	0	301	2,690
Oct.	4,590	162,240	19,030	x,000	— 410	0	0	288	1,160
Nov.	5,119	143,390	18,410	0	+ 130	0	0	...	0
Dec.	3,230	130,220	19,030	0	+ 390	0	0	...	0
Total or average	828,860		224,040	275,060	—6,260	352,930	0	302	7,190
1918									
Jan.	3,170	114,810	19,030	1,500	+ 450	0	0	255	380
Feb.	19,400	97,900	17,190	9,760	+ 250	0	0	242	2,620
Mar.	106,000	90,600	19,030	15,000	+ 250	0	0	266	3,990
April	122,000	162,820	18,410	44,630	— 300	0	0	306	14,100
May	148,000	221,480	19,030	46,120	—1,070	81,260	0	325	15,000
June	87,500	222,000	18,410	37,660	—1,460	35,420	0	325	12,640
July	7,930	216,550	19,030	7,930	—1,930	0	0	317	2,510
Aug.	4,860	195,590	19,030	4,860	—1,550	0	0	307	1,490
Sept.	8,810	175,010	18,410	8,810	— 990	0	0	295	2,690
Oct.	13,700	155,610	19,030	3,000	— 390	0	0	287	860
Nov.	12,300	146,890	18,410	0	+ 130	0	0	...	0
Dec.	12,500	140,910	19,030	0	+ 390	0	0	...	0
Total or average	546,170		224,040	179,270	—6,220	116,680	0	293	4,680
1919									
Jan.	10,300	134,770	19,030	6,000	+ 470	0	0	271	1,630
Feb.	47,100	120,510	17,190	10,500	+ 280	0	0	272	3,150
Mar.	51,500	140,200	19,030	46,120	+ 310	0	0	273	12,590
April	146,000	126,860	18,410	44,630	— 280	0	0	291	13,400
May	247,000	209,540	19,030	46,120	—1,070	168,320	0	325	15,000
June	33,800	222,000	18,410	24,270	—1,460	3,250	0	323	8,130
July	5,560	208,410	19,030	5,560	—1,740	0	0	313	1,750
Aug.	4,930	187,640	19,030	4,930	—1,380	0	0	303	1,490
Sept.	5,180	167,230	18,410	5,180	— 930	0	0	291	1,560
Oct.	4,690	147,890	19,030	3,000	— 360	0	0	279	830
Nov.	5,270	130,190	18,410	0	+ 120	0	0	...	0
Dec.	11,800	117,170	19,030	0	+ 320	0	0	...	0
Total or average	573,130		224,040	196,310	—5,720	171,570	0	294	4,970
1920									
Jan.	7,810	110,260	19,030	1,500	+ 390	0	0	254	380
Feb.	8,230	97,930	17,800	2,500	+ 230	0	0	243	650
Mar.	43,600	86,090	19,030	19,380	+ 220	0	0	241	4,680
April	88,700	91,500	18,410	35,000	— 190	0	0	252	9,110
May	191,000	126,600	19,030	35,880	— 720	39,970	0	304	10,990
June	78,500	222,000	18,410	38,240	—1,460	24,370	0	325	12,830
July	13,800	218,020	19,030	13,800	—1,930	0	0	318	4,400
Aug.	5,840	197,060	19,030	5,840	—1,550	0	0	308	1,800
Sept.	4,840	176,480	18,410	4,840	— 990	0	0	296	1,490
Oct.	9,590	157,080	19,030	3,000	— 390	0	0	286	860
Nov.	19,900	144,250	18,410	0	+ 130	0	0	...	0
Dec.	34,500	145,870	19,030	0	+ 390	0	0	...	0
Total or average	506,310		224,650	159,980	—5,870	64,340	0	283	3,930

VOIR ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1917
144,240	19,030	19,500	+ 530	0	0	0	276	5,390	Jan.
126,240	17,190	17,750	+ 330	13,790	0	0	270	5,360	Feb.
147,240	19,030	28,180	+ 430	1,900	0	0	288	8,150	Mar.
158,060	18,410	44,630	— 370	0	6,650	0	306	14,100	April
222,000	19,030	46,180	—1,070	59,840	85,440	0	325	15,000	May
217,440	18,410	44,750	—1,460	187,820	7,000	0	324	15,000	June
222,000	19,030	29,530	—1,930	0	6,000	0	324	9,580	July
212,510	19,030	16,350	—1,720	0	0	0	314	5,130	Aug.
184,760	18,410	8,680	—1,110	0	0	0	301	2,690	Sept.
162,240	19,030	4,000	— 410	0	0	0	288	1,160	Oct.
143,390	18,410	0	+ 130	0	0	0	...	0	Nov.
130,220	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	259,550	—6,260	263,350	105,090	0	302	6,790	Total or average
									1918
114,810	19,030	1,500	+ 450	0	0	0	255	380	Jan.
97,900	17,190	9,760	+ 250	0	0	0	242	2,620	Feb.
90,600	19,030	15,000	+ 250	0	0	0	266	3,990	Mar.
162,820	18,410	44,630	— 300	0	0	0	306	14,100	April
221,480	19,030	46,120	—1,070	0	81,260	0	325	15,000	May
222,000	18,410	37,660	—1,460	0	35,420	0	325	12,640	June
216,550	19,030	7,930	—1,930	0	0	0	317	2,510	July
195,590	19,030	4,860	—1,550	0	0	0	307	1,490	Aug.
175,010	18,410	8,810	— 990	0	0	0	295	2,690	Sept.
155,610	19,030	3,000	— 390	0	0	0	287	860	Oct.
146,890	18,410	0	+ 130	0	0	0	...	0	Nov.
140,910	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	179,270	—6,220	0	116,680	0	293	4,680	Total or average
									1919
134,770	19,030	6,000	+ 470	0	0	0	271	1,630	Jan.
120,510	17,190	10,500	+ 280	0	0	0	272	3,150	Feb.
140,200	19,030	46,120	+ 310	0	0	0	273	12,590	Mar.
126,860	18,410	44,630	— 280	0	0	0	291	13,400	April
209,540	19,030	46,120	—1,070	0	168,320	0	325	15,000	May
222,000	18,410	24,270	—1,460	0	3,250	0	323	8,130	June
208,410	19,030	5,560	—1,740	0	0	0	313	1,750	July
187,640	19,030	4,930	—1,380	0	0	0	303	1,490	Aug.
167,230	18,410	5,180	— 930	0	0	0	291	1,560	Sept.
147,890	19,030	3,000	— 360	0	0	0	279	830	Oct.
130,190	18,410	0	+ 120	0	0	0	...	0	Nov.
117,170	19,030	0	+ 320	0	0	0	...	0	Dec.
	224,040	196,310	—5,720	0	171,570	0	294	4,970	Total or average
									1920
110,260	19,030	1,500	+ 390	0	0	0	254	380	Jan.
97,930	17,800	2,500	+ 230	0	0	0	243	650	Feb.
86,090	19,030	19,380	+ 220	0	0	0	241	4,680	Mar.
91,500	18,410	35,000	— 190	0	0	0	252	9,110	April
126,600	19,030	35,880	— 720	0	39,970	0	304	10,990	May
222,000	18,410	38,240	—1,460	0	24,370	0	325	12,830	June
218,020	19,030	13,800	—1,930	0	0	0	318	4,400	July
197,060	19,030	5,840	—1,550	0	0	0	308	1,800	Aug.
176,480	18,410	4,840	— 990	0	0	0	296	1,490	Sept.
157,080	19,030	3,000	— 390	0	0	0	286	860	Oct.
144,250	18,410	0	+ 130	0	0	0	...	0	Nov.
145,870	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,650	159,980	—5,870	0	64,340	0	283	3,930	Total or average

TABLE 6a (Continued). PARDEE RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1921									
Jan.	78,700	161,730	19,030	25,500	+ 530	0	0	300	7,630
Feb.	61,100	196,430	17,190	41,650	+ 420	0	0	312	14,420
Mar.	108,000	199,110	19,030	46,120	+ 430	20,390	0	323	14,910
April	123,000	222,000	18,410	44,630	— 370	59,590	0	325	15,000
May	218,000	222,000	19,030	46,120	—1,070	151,780	0	325	15,000
June	178,000	222,000	18,410	44,630	—1,460	113,500	0	325	15,000
July	20,400	222,000	19,030	17,610	—1,930	280	0	321	5,690
Aug.	7,750	203,550	19,030	7,750	—1,550	0	0	311	2,410
Sept.	5,710	182,970	18,410	5,710	— 990	0	0	300	1,780
Oct.	7,190	163,570	19,030	3,000	— 390	0	0	289	870
Nov.	4,530	148,340	18,410	0	+ 130	0	0	...	0
Dec.	10,900	134,590	19,030	0	+ 360	0	0	...	0
Total or average	823,280		224,040	282,720	—5,890	345,540	0	313	7,660
1922									
Jan.	19,200	126,820	19,030	1,500	+ 440	0	0	272	400
Feb.	58,900	125,930	17,190	3,000	+ 270	0	0	280	940
Mar.	56,500	164,910	19,030	46,120	+ 330	0	0	288	13,310
April	107,000	156,590	18,410	44,630	— 320	0	0	297	13,690
May	318,000	200,230	19,030	46,120	—1,070	230,010	0	325	14,970
June	280,000	222,000	18,410	44,630	—1,460	215,500	0	325	15,000
July	39,200	222,000	19,030	27,470	—1,930	5,030	0	323	8,900
Aug.	10,100	207,740	19,030	15,100	—1,630	0	0	312	4,720
Sept.	7,620	182,080	18,410	10,620	—1,050	0	0	299	3,280
Oct.	7,990	159,620	19,030	4,000	— 400	0	0	287	1,140
Nov.	10,700	144,180	18,410	0	+ 130	0	0	...	0
Dec.	58,800	136,600	19,030	0	+ 390	0	0	...	0
Total or average	974,010		224,040	243,190	—6,300	450,540	0	301	6,390
1923									
Jan.	46,200	176,760	19,030	46,120	+ 580	0	0	294	13,560
Feb.	33,300	158,390	17,190	41,650	+ 420	0	0	283	13,050
Mar.	43,300	133,270	19,030	46,120	+ 430	0	0	268	12,340
April	127,000	111,850	18,410	44,630	— 370	0	0	282	13,010
May	225,000	175,440	19,030	46,120	—1,070	112,220	0	321	14,790
June	104,000	222,000	18,410	44,630	—1,460	39,500	0	325	15,000
July	28,500	222,000	19,030	22,660	—1,930	770	0	322	7,330
Aug.	9,100	206,110	19,030	9,100	—1,550	0	0	312	2,850
Sept.	9,040	185,530	18,410	9,040	— 990	0	0	302	2,820
Oct.	9,410	166,130	19,030	3,000	— 390	0	0	292	870
Nov.	7,080	153,120	18,410	0	+ 120	0	0	...	0
Dec.	6,950	141,910	19,030	0	+ 350	0	0	...	0
Total or average	648,880		224,040	313,070	—5,860	152,490	0	300	7,930
1924									
Jan.	8,670	130,180	19,030	8,670	+ 390	0	0	267	2,310
Feb.	15,900	111,540	17,800	15,900	+ 210	0	0	252	4,300
Mar.	11,200	93,950	19,030	11,200	+ 200	0	0	237	2,650
April	53,100	75,120	18,410	30,000	— 140	0	0	225	6,970
May	60,900	79,670	19,030	31,000	— 420	0	0	245	7,580
June	4,210	90,120	18,410	4,210	— 640	0	0	233	1,010
July	1,220	71,070	19,030	1,220	— 690	0	0	213	260
Aug.	330	51,350	19,030	330	— 450	0	0	186	70
Sept.	2,980	31,870	6,770	2,980	— 270	0	11,640	161	500
Oct.	5,340	24,830	0	5,340	— 110	0	19,030	159	850
Nov.	18,200	24,720	0	18,200	+ 40	0	18,410	159	2,990
Dec.	24,600	24,760	9,470	10,950	+ 120	0	9,560	159	1,750
Total or average	206,650		166,010	140,000	—1,760	0	58,640	208	2,590

VOIR ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1921
161,730	19,030	46,650	+ 530	40,060	0	0	283	13,200	Jan.
135,220	17,190	38,130	+ 420	4,710	0	0	275	11,620	Feb.
136,710	19,030	39,360	+ 430	15,090	0	0	287	10,970	Mar.
171,660	18,410	32,610	— 370	21,270	0	0	314	10,400	April
222,000	19,030	46,320	—1,070	105,650	55,850	0	324	15,090	May
212,080	18,410	44,630	—1,460	106,950	0	0	322	14,850	June
218,630	19,030	16,740	—1,930	0	0	0	320	5,420	July
201,330	19,030	7,750	—1,550	0	0	0	310	2,410	Aug.
180,750	18,410	5,710	— 990	0	0	0	299	1,760	Sept.
161,350	19,030	3,000	— 390	0	0	0	288	866	Oct.
146,120	18,410	0	+ 130	0	0	0	...	0	Nov.
132,370	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	280,900	—5,890	293,730	55,850	0	302	7,170	Total or average
									1922
124,600	19,030	1,500	+ 440	0	0	0	271	400	Jan.
123,710	17,190	8,450	+ 270	5,650	0	0	278	2,650	Feb.
151,590	19,030	32,800	+ 330	0	0	0	288	9,790	Mar.
156,590	18,410	44,630	— 320	0	0	0	297	13,690	April
200,230	19,030	46,270	—1,070	178,710	57,990	0	323	14,970	May
215,160	18,410	44,940	—1,460	209,840	0	0	323	15,000	June
220,510	19,030	27,470	—1,930	530	3,010	0	323	8,900	July
207,740	19,030	15,100	—1,630	0	0	0	312	4,720	Aug.
182,080	18,410	10,620	—1,050	0	0	0	299	3,280	Sept.
159,620	19,030	4,000	— 400	0	0	0	287	1,140	Oct.
144,180	18,410	0	+ 130	0	0	0	...	0	Nov.
136,600	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	235,780	—6,300	394,730	61,000	0	300	6,220	Total or average
									1923
176,760	19,030	44,710	+ 580	23,440	0	0	285	12,770	Jan.
136,360	17,190	19,620	+ 420	0	0	0	275	5,980	Feb.
133,270	19,030	46,120	+ 430	0	0	0	268	12,340	Mar.
111,850	18,410	44,630	— 370	0	0	0	282	13,010	April
175,440	19,030	46,420	—1,070	113,090	10,520	0	319	14,790	May
210,400	18,410	44,760	—1,460	32,930	0	0	321	14,830	June
216,840	19,030	20,600	—1,930	0	0	0	321	6,670	July
203,780	19,030	9,100	—1,550	0	0	0	311	2,840	Aug.
183,200	18,410	9,040	— 990	0	0	0	301	2,810	Sept.
163,800	19,030	3,000	— 390	0	0	0	291	870	Oct.
150,790	18,410	0	+ 120	0	0	0	...	0	Nov.
139,580	19,030	0	+ 350	0	0	0	...	0	Dec.
	224,040	288,000	—5,860	169,370	10,520	0	297	7,250	Total or average
									1924
127,850	19,030	8,670	+ 390	0	0	0	265	2,300	Jan.
109,210	17,800	15,900	+ 210	0	0	0	250	4,250	Feb.
91,620	19,030	11,200	+ 200	0	0	0	235	2,620	Mar.
72,790	18,410	30,000	— 140	0	0	0	224	6,940	April
77,340	19,030	31,000	— 420	0	0	0	243	7,530	May
87,790	18,410	4,210	— 640	0	0	0	231	1,000	June
68,740	19,030	1,220	— 690	0	0	0	210	260	July
49,020	19,030	330	— 450	0	0	0	183	59	Aug.
29,540	4,480	2,980	— 270	0	0	13,930	160	490	Sept.
24,790	0	5,340	— 110	0	0	12,030	159	859	Oct.
24,680	0	18,200	+ 40	0	0	18,410	159	2,990	Nov.
24,720	9,430	10,950	+ 120	0	0	9,690	159	1,759	Dec.
	163,680	140,000	—1,760	0	0	60,970	206	2,570	Total or average

TABLE 6a (Concluded). PARDEE RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1925									
Jan.	22,500	29,060	19,030	1,500	+ 160	0	0	172	260
Feb.	107,000	31,190	17,190	2,500	+ 100	0	0	231	640
Mar.	81,800	118,600	19,030	13,500	+ 260	0	0	280	3,780
April	164,000	168,130	18,410	44,630	— 290	46,800	0	315	14,530
May	237,000	222,000	19,030	46,120	—1,070	170,780	0	325	15,000
June	124,000	222,000	18,410	44,630	—1,460	59,500	0	325	15,000
July	21,000	222,000	19,030	16,690	—1,930	0	0	322	5,390
Aug.	10,200	205,350	19,030	10,200	—1,490	0	0	312	3,190
Sept.	7,910	184,830	18,410	7,910	— 990	0	0	301	2,470
Oct.	5,560	165,430	19,030	3,000	— 390	0	0	291	870
Nov.	7,620	148,570	18,410	0	+ 130	0	0	...	0
Dec.	14,400	137,910	19,030	0	+ 360	0	0	...	0
Total or average	802,990		224,040	190,680	—6,610	277,080	0	288	5,100
Total for 21-year period 1905-1926	**17,355,000**		**4,649,250**	**5,331,950**	**122,650**	**7,263,370**	**58,640**		
Average for 21-year period, 1905-1926	**826,430**		**221,390**	**253,900**	**5,840**	**345,870**	**2,790**	**296**	**6,640**

VOIR ON MOKELUMNE RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

tions Carried out on a Daily Basis.

mary, see Table 6, page 124.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Coordinated with flood control by reservoir operating diagram
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.
Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1925
29,060	19,030	1,500	+ 160	0	0	0	172	260	Jan.
31,190	17,190	2,500	+ 100	0	0	0	231	640	Feb.
118,600	19,030	13,500	+ 260	0	0	0	280	3,780	Mar.
168,130	18,410	44,680	— 290	19,410	27,340	0	315	14,530	April
222,000	19,030	46,380	—1,070	108,600	72,430	0	323	15,000	May
211,490	18,410	43,870	—1,460	54,840	0	0	321	14,540	June
216,910	19,030	16,310	—1,930	0	0	0	320	5,230	July
200,640	19,030	10,200	—1,490	0	0	0	310	3,160	Aug.
180,120	18,410	7,910	— 990	0	0	0	298	2,440	Sept.
160,720	19,030	3,000	— 390	0	0	0	288	860	Oct.
143,860	18,410	0	+ 130	0	0	0	...	0	Nov.
133,200	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	189,850	—6,610	182,850	99,770	0	286	5,040	Total or average
	4,646,920	**5,358,630**	**122,650**	**5,145,700**	**2,098,030**	**60,970**			**Total for 21-year period, 1905-1926**
	221,280	**255,170**	**5,840**	**245,030**	**99,910**	**2,900**	**292**	**6,510**	**Average for 21-year period, 1905-1926**

TABLE 7a. PARDEE RESER

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield:in kilowatts (Load factor= 1.00)
1905										
Jan.	26,320	145,860	19,030	10,500	+ 610	0	0	0	282	2,960
Feb.	47,370	143,260	17,190	22,500	+ 380	0	0	0	285	7,100
Mar.	86,700	151,320	19,030	46,120	+ 430	0	0	0	290	13,370
April	116,600	173,300	18,410	44,630	— 370	0	4,490	0	311	14,380
May	156,600	222,000	19,030	46,200	—1,070	73,570	21,890	0	324	15,000
June	99,070	216,840	18,410	40,510	—1,460	38,270	0	0	323	13,540
July	11,560	217,260	19,030	11,560	—1,930	0	0	0	318	3,680
Aug.	7,870	196,300	19,030	7,870	—1,550	0	0	0	307	2,420
Sept.	8,270	175,720	18,410	8,270	— 990	0	0	0	296	2,530
Oct.	7,010	156,320	19,030	3,000	— 390	0	0	0	285	860
Nov.	4,730	140,910	18,410	0	+ 120	0	0	0	...	0
Dec.	5,960	127,350	19,030	0	+ 360	0	0	0	...	0
Total or average	578,060		224,040	241,160	—5,860	111,840	26,380	0	302	6,300
1906										
Jan.	61,200	114,640	19,030	0	+ 420	0	0	0	...	0
Feb.	44,900	157,230	17,190	41,650	+ 320	0	0	0	282	13,020
Mar.	155,000	143,610	19,030	44,580	+ 370	63,140	0	0	289	12,880
April	175,000	172,230	18,410	43,760	— 370	26,850	35,840	0	314	14,220
May	289,000	222,000	19,030	46,430	—1,070	137,510	96,860	0	323	15,000
June	358,000	210,100	18,410	45,110	—1,460	285,980	0	0	322	15,000
July	218,000	217,140	19,030	44,620	—1,930	48,070	99,620	0	325	14,500
Aug.	21,900	221,870	19,030	31,900	—1,720	0	0	0	317	10,130
Sept.	12,000	191,120	18,410	11,600	—1,110	0	0	0	305	3,650
Oct.	11,700	172,000	19,030	6,500	— 410	0	0	0	296	1,920
Nov.	14,800	157,760	18,410	3,000	+ 140	0	0	0	289	900
Dec.	53,900	151,290	19,030	11,310	+ 420	9,600	0	0	292	3,370
Total or average	1,415,400		224,040	330,460	—6,400	571,150	232,320	0	305	8,680
1907										
Jan.	70,100	165,670	19,030	49,580	+ 630	33,160	0	0	283	14,050
Feb.	154,000	134,630	17,190	49,240	+ 420	91,070	0	0	275	15,000
Mar.	300,000	131,550	19,030	51,000	+ 430	149,290	0	0	294	14,950
April	264,000	212,660	18,410	45,470	— 370	128,450	61,960	0	319	15,000
May	259,000	222,000	19,030	46,120	—1,070	11,670	181,110	0	325	15,000
June	281,000	222,000	18,410	44,630	—1,460	107,620	108,880	0	325	15,000
July	205,000	222,000	19,030	46,120	—1,930	0	137,920	0	325	15,000
Aug.	43,200	222,000	19,030	31,290	—1,720	0	2,700	0	323	10,130
Sept.	15,300	210,460	18,410	30,500	—1,230	0	0	0	311	9,810
Oct.	17,000	175,620	19,030	9,500	— 490	0	0	0	299	2,840
Nov.	13,900	163,600	18,410	9,000	+ 160	0	0	0	290	2,710
Dec.	20,200	150,250	19,030	3,000	+ 480	0	0	0	286	860
Total or average	1,642,700		224,040	415,450	—6,150	521,260	492,570	0	305	10,820
1908										
Jan.	33,000	148,900	19,030	12,500	+ 610	0	0	0	286	3,580
Feb.	22,600	150,980	17,800	28,500	+ 400	0	0	0	279	8,510
Mar.	50,200	127,680	19,030	33,470	+ 430	0	0	0	302	10,090
April	103,000	125,810	18,410	44,630	— 370	0	0	0	277	12,780
May	117,000	165,400	19,030	46,120	—1,070	0	0	0	310	14,300
June	75,000	216,180	18,410	40,220	—1,460	0	10,770	0	325	13,500
July	14,100	220,320	19,030	14,100	—1,930	0	0	0	319	4,500
Aug.	6,400	199,360	19,030	6,400	—1,550	0	0	0	309	1,980
Sept.	8,030	178,780	18,410	8,030	— 990	0	0	0	297	2,470
Oct.	8,730	159,580	19,030	3,000	— 390	0	0	0	288	860
Nov.	7,380	145,690	18,410	0	+ 130	0	0	0	...	0
Dec.	9,900	134,790	19,030	0	+ 370	0	0	0	...	0
Total or average	455,340		224,650	236,970	—5,820	0	10,770	0	299	6,020

VOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1905
101,560	19,030	10,500	+ 610	0	0	0	251	2,630	Jan.
98,960	17,190	22,500	+ 380	0	0	0	254	6,320	Feb.
107,020	19,030	46,120	+ 430	0	0	0	260	12,020	Mar.
129,000	18,410	45,140	— 370	21,270	0	0	275	12,810	April
160,410	19,030	38,010	—1,070	49,900	0	0	310	11,870	May
209,000	18,410	41,550	—1,460	40,370	0	0	319	13,720	June
206,280	19,030	11,560	—1,930	0	0	0	312	3,620	July
185,320	19,030	7,870	—1,550	0	0	0	301	2,370	Aug.
164,740	18,410	8,270	— 990	0	0	0	289	2,470	Sept.
145,340	19,030	3,000	— 390	0	0	0	278	830	Oct.
129,930	18,410	0	+ 120	0	0	0	...	0	Nov.
116,370	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	234,520	—5,860	111,540	0	0	285	5,700	Total or average
									1906
103,660	19,030	10,200	+ 420	6,050	0	0	273	2,770	Jan.
130,000	17,190	41,650	+ 320	0	0	0	263	12,160	Feb.
116,380	19,030	50,920	+ 370	67,620	0	0	269	13,700	Mar.
134,180	18,410	41,080	— 370	68,360	0	0	279	11,720	April
180,960	19,030	41,780	—1,070	149,080	50,000	0	319	13,370	May
209,000	18,410	45,380	—1,460	292,750	0	0	320	15,000	June
209,000	19,030	44,140	—1,930	41,760	98,270	0	324	14,310	July
221,870	19,030	31,900	—1,720	0	0	0	317	10,130	Aug.
191,120	18,410	11,600	—1,110	0	0	0	305	3,650	Sept.
172,000	19,030	6,500	— 410	0	0	0	296	1,920	Oct.
157,760	18,410	7,870	+ 140	19,330	0	0	282	2,250	Nov.
127,090	19,030	19,950	+ 420	12,430	0	0	272	5,390	Dec.
	224,040	352,970	—6,400	657,380	148,270	0	295	8,850	Total or average
									1907
130,000	19,030	47,260	+ 630	4,440	0	0	271	12,820	Jan.
130,000	17,190	49,500	+ 420	87,730	0	0	274	15,000	Feb.
130,000	19,030	52,200	+ 430	166,630	0	0	288	15,000	Mar.
192,570	18,410	38,470	— 370	180,090	0	0	298	11,780	April
219,230	19,030	46,670	—1,070	155,220	47,240	0	321	15,000	May
209,000	18,410	45,460	—1,460	215,670	0	0	319	15,000	June
209,000	19,030	45,650	—1,930	31,150	94,240	0	324	14,810	July
222,000	19,030	31,290	—1,720	2,700	0	0	323	10,130	Aug.
210,460	18,410	30,500	—1,230	0	0	0	311	9,810	Sept.
175,620	19,030	9,500	— 490	0	0	0	299	2,840	Oct.
163,600	18,410	13,260	+ 160	21,130	0	0	283	3,900	Nov.
124,860	19,030	3,000	+ 480	0	0	0	268	810	Dec.
	224,040	412,760	—6,150	864,760	141,480	0	298	10,560	Total or average
									1908
123,510	19,030	12,500	+ 610	0	0	0	268	3,350	Jan.
125,590	17,800	28,500	+ 400	0	0	0	261	7,960	Feb.
102,290	19,030	33,470	+ 430	0	0	0	252	8,410	Mar.
100,420	18,410	39,750	— 370	0	0	0	260	10,670	April
144,890	19,030	31,510	—1,070	1,280	0	0	303	9,560	May
209,000	18,410	40,620	—1,460	16,180	0	0	319	13,420	June
207,330	19,030	14,100	—1,930	0	0	0	313	4,410	July
186,370	19,030	6,400	—1,550	0	0	0	302	1,940	Aug
165,790	18,410	8,030	— 990	0	0	0	290	2,400	Sept.
146,390	19,030	3,000	— 390	0	0	0	280	830	Oct.
132,700	18,410	0	+ 130	0	0	0	...	0	Nov.
121,800	19,030	0	+ 370	0	0	0	...	0	Dec.
	224,650	217,880	—5,820	17,460	0	0	285	5,220	Total or average

TABLE 7a (Continued). PARDEE

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.

Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1909										
Jan.	179,000	126,030	19,030	20,990	+ 440	105,260	0	0	294	6,530
Feb.	126,000	160,190	17,190	48,870	+ 420	87,310	0	0	277	15,000
Mar.	103,000	133,240	19,030	42,020	+ 430	13,700	0	0	282	11,770
April	167,000	161,920	18,410	35,940	− 370	12,220	39,980	0	313	11,750
May	228,000	222,000	19,030	46,430	−1,070	99,300	74,470	0	323	15,000
June	256,000	209,700	18,410	45,270	−1,460	184,310	0	0	321	15,000
July	50,700	216,250	19,030	30,130	−1,930	4,150	0	0	324	9,770
Aug.	7,070	211,710	19,030	17,070	−1,720	0	0	0	313	5,350
Sept.	4,600	180,960	18,410	7,600	−1,110	0	0	0	298	2,350
Oct.	8,060	158,440	19,030	4,000	− 410	0	0	0	287	1,140
Nov.	56,600	143,060	18,410	0	+ 140	0	0	0	...	0
Dec.	92,200	181,390	19,030	47,500	+ 480	46,730	0	0	312	14,800
Total or average	1,278,230		224,040	345,820	−6,160	552,980	114,450	0	304	9,010
1910										
Jan.	82,400	160,810	19,030	45,580	+ 680	44,650	0	0	286	13,170
Feb.	52,600	134,630	17,190	32,330	+ 420	3,400	0	0	275	9,850
Mar.	147,000	134,730	19,030	47,610	+ 430	47,070	0	0	287	13,640
April	193,000	168,450	18,410	42,440	− 370	22,560	55,670	0	315	13,860
May	196,000	222,000	19,030	46,380	−1,070	92,040	47,990	0	323	15,000
June	59,500	211,490	18,410	33,310	−1,460	14,690	0	0	319	10,920
July	10,600	203,120	19,030	10,600	−1,930	0	0	0	310	3,290
Aug.	3,960	182,160	19,030	3,960	−1,550	0	0	0	299	1,180
Sept.	4,420	161,580	18,410	4,420	− 990	0	0	0	287	1,310
Oct.	6,580	142,180	19,030	3,000	− 390	0	0	0	276	820
Nov.	10,100	126,340	18,410	0	+ 120	0	0	0	...	0
Dec.	21,900	118,150	19,030	0	+ 370	0	0	0	...	0
Total or average	788,060		224,040	269,630	−5,740	224,410	103,660	0	298	6,900
1911										
Jan.	148,000	121,390	19,030	18,120	+ 470	52,820	0	0	275	5,090
Feb.	143,000	179,890	17,190	47,070	+ 420	125,410	0	0	286	14,910
Mar.	204,000	133,640	19,030	52,540	+ 430	102,620	0	0	286	15,000
April	256,000	163,880	18,410	46,240	− 370	78,010	54,850	0	314	15,000
May	262,000	222,000	19,030	46,160	−1,070	97,820	103,280	0	325	15,000
June	331,000	216,640	18,410	44,870	−1,460	262,490	0	0	323	15,000
July	117,000	220,410	19,030	40,400	−1,930	11,260	47,420	0	325	13,130
Aug.	16,500	217,370	19,030	26,500	−1,720	0	0	0	315	8,360
Sept.	9,280	186,620	18,410	11,500	−1,110	0	0	0	302	3,580
Oct.	8,790	164,880	19,030	4,000	− 410	0	0	0	290	1,170
Nov.	11,900	150,230	18,410	0	+ 140	0	0	0	...	0
Dec.	8,360	143,850	19,030	2,000	+ 400	0	0	0	273	550
Total or average	1,515,830		224,040	339,400	−6,210	730,430	205,550	0	302	8,850
1912										
Jan.	14,000	131,590	19,030	2,920	+ 490	0	0	0	272	790
Feb.	10,800	124,130	17,800	8,000	+ 300	0	0	0	263	2,260
Mar.	21,000	109,430	19,030	24,000	+ 290	0	0	0	249	5,980
April	30,800	87,690	18,410	34,000	− 230	0	0	0	229	8,040
May	140,000	65,850	19,030	31,000	− 600	0	0	0	247	7,650
June	125,000	155,220	18,410	33,020	−1,250	0	10,360	0	319	10,920
July	9,900	217,180	19,030	9,900	−1,930	0	0	0	318	3,150
Aug.	5,580	196,220	19,030	5,580	−1,550	0	0	0	307	1,720
Sept.	6,600	175,640	18,410	6,600	− 990	0	0	0	296	2,010
Oct.	5,260	156,240	19,030	3,000	− 390	0	0	0	285	860
Nov.	31,100	139,080	18,410	0	+ 120	0	0	0	...	0
Dec.	10,500	151,890	19,030	11,000	+ 400	0	0	0	281	3,090
Total or average	410,540		224,650	169,020	−5,340	0	10,360	0	279	3,870

RESERVOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.: snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1909
113,040	19,030	32,070	+ 440	111,380	0	0	271	8,880	Jan.
130,000	17,190	49,590	+ 420	59,640	0	0	273	15,000	Feb.
130,000	19,030	54,910	+ 430	29,490	0	0	273	15,000	Mar.
130,000	18,410	42,370	— 370	53,940	0	0	278	12,060	April
181,910	19,030	44,230	—1,070	104,550	32,030	0	319	14,150	May
209,000	18,410	45,460	—1,460	190.670	0	0	319	15,000	June
209,000	19,030	28,190	—1,930	7,700	0	0	320	9,050	July
202,850	19,030	8,210	—1,720	0	0	0	310	2,550	Aug.
180,960	18,410	7,600	—1,110	0	0	0	298	2,350	Sept.
158,440	19,030	4,000	— 410	0	0	0	287	1,140	Oct.
143,060	18,410	19,400	+ 140	31,990	0	0	273	5,490	Nov.
130,000	19,030	50,140	+ 480	28,610	0	0	272	13,660	Dec.
	224,040	386,170	—6,160	617,970	32,030	0	292	9,490	Total or average
									1910
124,900	19,030	50,310	+ 680	8,640	0	0	273	13,710	Jan.
130,000	17,190	41,960	+ 420	0	0	0	271	12,600	Feb.
123,870	19,030	53,490	+ 430	68,780	0	0	273	14,600	Mar.
130,000	18,410	45,420	— 370	63,120	0	0	280	13,030	April
195,680	19,030	43,250	—1,070	100,960	18,370	0	320	13,840	May
209,000	18,410	33,660	—1,460	14,330	0	0	318	11,110	June
200,640	19,030	10,600	—1,930	0	0	0	310	3,280	July
179,680	19,030	3,960	—1,550	0	0	0	298	1,180	Aug.
159,100	18,410	4,420	— 990	0	0	0	286	1,310	Sept.
139,700	19,030	3,000	— 390	0	0	0	274	820	Oct.
123,860	18,410	0	+ 120	0	0	0	...	0	Nov.
115,670	19,030	0	+ 370	0	0	0	...	0	Dec.
	224,040	290,070	—5,740	255,830	18,370	0	290	7,090	Total or average
									1911
118,910	19,030	27,530	+ 470	47,150	0	0	270	7,470	Jan.
173,670	17,190	48,110	+ 420	121,790	0	0	281	14,960	Feb.
130,000	19,030	54,840	+ 430	130,560	0	0	273	15,000	Mar.
130,000	18,410	41,070	— 370	126,840	0	0	280	11,740	April
199,310	19,030	43,940	—1,070	149,710	38,560	0	320	14,090	May
209,000	18,410	45,450	—1,460	265,680	0	0	319	15,000	June
209,000	19,030	39,050	—1,930	22,400	26,220	0	324	12,620	July
217,370	19,030	26,500	—1,720	0	0	0	315	8,360	Aug.
186,620	18,410	11,500	—1,110	0	0	0	302	3,580	Sept.
164,880	19,030	4,000	— 410	0	0	0	290	1,170	Oct.
150,230	18,410	3,490	+ 140	12,900	0	0	278	1,000	Nov.
127,470	19,030	2,000	+ 400	0	0	0	266	540	Dec.
	224,040	347,480	—6,210	877,030	64,780	0	295	8,750	Total or average
									1912
115,200	19,030	2,920	+ 490	0	0	0	260	750	Jan.
107,740	17,800	8,000	+ 300	0	0	0	251	2,140	Feb.
93,040	19,030	24,000	+ 290	0	0	0	234	5,630	Mar.
71,300	18,410	32,670	— 230	0	0	0	212	7,170	April
50,790	19,030	31,000	— 600	0	0	0	232	7,190	May
140,160	18,410	32,740	—1,250	8,580	0	0	312	10,600	June
204,180	19,030	9,900	—1,930	0	0	0	312	3,080	July
183,220	19,030	5,580	—1,550	0	0	0	300	1,680	Aug.
162,640	18,410	6,600	— 990	0	0	0	288	1,960	Sept.
143,240	19,030	3,000	— 390	0	0	0	276	830	Oct.
126,080	18 410	1,810	+ 120	8,900	0	0	275	510	Nov.
128,180	19,030	11,000	+ 400	0	0	0	265	2,920	Dec.
	224,650	169,220	—5,340	17,480	0	0	267	3,700	Total or average

TABLE 7a (Continued). PARDEE

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13 000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield:in kilowatts (Load factor= 1.00)
1913										
Jan.	22,600	132,760	19,030	2,500	+ 490	0	0	0	274	690
Feb.	19,800	134,320	17,190	18,500	+ 300	0	0	0	271	5,540
Mar.	21,600	118,730	19,030	34,770	+ 310	0	0	0	252	8,760
April	83,900	86,840	18,410	35,000	— 260	0	0	0	247	8,930
May	148,000	117,070	19,030	32,060	— 830	0	0	0	292	9,370
June	55,300	213,150	18,410	32,210	—1,460	0	3,280	0	324	10,790
July	10,500	213,090	19,030	10,500	—1,930	0	0	0	316	3,320
Aug.	8,360	192,130	19,030	8,360	—1,550	0	0	0	305	2,550
Sept.	6,370	171,550	18,410	6,370	— 990	0	0	0	293	1,930
Oct.	7,130	152,150	19,030	3,000	— 390	0	0	0	282	850
Nov.	8,090	136,860	18,410	0	+ 130	0	0	0	...	0
Dec.	14,300	126,670	19,030	0	+ 360	0	0	0	...	0
Total or average	405,950		224,040	183,270	—5,820	0	3,280	0	286	4,370
1914										
Jan.	169,000	122,300	19,030	39,510	+ 450	95,510	0	0	283	11,160
Feb.	102,000	137,700	17,190	42,430	+ 420	48,850	0	0	275	12,920
Mar.	105,000	131,650	19,030	45,680	+ 430	6,190	0	0	283	12,840
April	144,000	166,180	18,410	39,980	— 370	17,370	12,050	0	314	13,060
May	261,000	222,000	19,030	46,430	—1,070	152,780	53,790	0	323	15,000
June	198,000	209,900	18,410	45,270	—1,460	126,510	0	0	320	15,000
July	50,200	216,250	19,030	30,790	—1,930	1,900	890	0	324	10,130
Aug.	10,200	211,910	19,030	20,200	—1,720	0	0	0	313	6,330
Sept.	7,800	181,160	18,410	10,800	—1,110	0	0	0	298	3,330
Oct.	8,120	158,640	19,030	7,000	— 410	0	0	0	286	2,000
Nov.	7,970	140,320	18,410	0	+ 140	0	0	0	...	0
Dec.	12,600	130,020	19,030	0	+ 390	0	0	0	...	0
Total or average	1,075,890		224,040	328,090	—6,240	449,110	66,730	0	302	8,450
1915										
Jan.	19,600	123,980	19,030	1,500	+ 490	0	0	0	269	400
Feb.	75,000	123,540	17,190	22,210	+ 300	17,270	0	0	278	6,860
Mar.	61,400	142,170	19,030	18,950	+ 390	1,190	0	0	286	5,480
April	133,000	164,790	18,410	44,630	— 370	12,380	0	0	310	14,310
May	218,000	222,000	19,030	46,410	—1,070	142,010	20,690	0	323	15,000
June	231,000	210,790	18,410	45,230	—1,460	159,450	0	0	321	15,000
July	44,000	217,240	19,030	28,130	—1,930	1,270	340	0	323	9,130
Aug.	5,710	210,540	19,030	9,710	—1,630	0	0	0	314	3,050
Sept.	6,370	185,880	18,410	9,370	—1,050	0	0	0	300	2,920
Oct.	6,830	163,420	19,030	4,000	— 400	0	0	0	289	1,160
Nov.	8,690	146,820	18,410	0	+ 130	0	0	0	...	0
Dec.	19,800	137,230	19,030	0	+ 390	0	0	0	...	0
Total or average	829,400		224,040	230,140	—6,210	333,570	21,030	0	302	6,080
1916										
Jan.	79,300	138,390	19,030	30,450	+ 490	34,170	0	0	280	8,510
Feb.	97,800	134,530	17,800	49,270	+ 400	30,730	0	0	275	14,470
Mar.	175,000	134,930	19,030	52,940	+ 430	72,920	0	0	283	14,990
April	195,000	165,470	18,410	44,740	— 370	21,790	53,160	0	314	14,510
May	205,000	222,000	19,030	46,420	—1,070	77,790	72,090	0	323	15,000
June	181,000	210,600	18,410	45,170	—1,460	109,520	0	0	321	14,970
July	46,900	217,040	19,030	30,370	—1,930	0	860	0	324	9,850
Aug.	10,500	211,750	19,030	19,500	—1,720	0	0	0	313	6,100
Sept.	6,720	182,000	18,410	9,720	—1,110	0	0	0	299	3,000
Oct.	12,700	159,480	19,030	6,000	— 410	0	0	0	288	1,730
Nov.	11,800	146,740	18,410	4,000	+ 140	0	0	0	280	1,170
Dec.	27,600	136,270	19,030	1,000	+ 400	0	0	0	282	280
Total or average	1,049,320		224,650	339,580	—6,210	346,920	126,110	0	298	8,690

RESERVOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1913
109,050	19,030	2,500	+ 490	0	0	0	257	650	Jan.
110,610	17,190	18,500	+ 300	0	0	0	252	5,180	Feb.
95,020	19,030	34,770	+ 310	0	0	0	230	8,010	Mar.
63,130	18,410	33,320	— 260	0	0	0	225	7,750	April
95,040	19,030	31,000	— 830	0	0	0	278	8,600	May
192,180	18,410	27,540	—1,460	0	0	0	317	9,040	June
200,070	19,030	10,500	—1,930	0	0	0	310	3,250	July
179,110	19,030	8,360	—1,550	0	0	0	298	2,490	Aug.
158,530	18,410	6,370	— 990	0	0	0	285	1,880	Sept.
139,130	19,030	3,000	— 390	0	0	0	274	820	Oct.
123,840	18,410	0	+ 130	0	0	0	...	0	Nov.
113,650	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	175,860	—5,820	0	0	0	273	3,950	Total or average
									1914
109,280	19,030	43,920	+ 450	85,780	0	0	273	12,030	Jan.
130,000	17,190	45,280	+ 420	39,950	0	0	273	13,660	Feb.
130,000	19,030	54,910	+ 430	31,490	0	0	273	15,000	Mar.
130,000	18,410	40,340	— 370	60,080	0	0	276	11,440	April
154,800	19,030	41,000	—1,070	145,700	0	0	313	12,930	May
209,000	18,410	45,460	—1,460	132,670	0	0	319	15,000	June
203,000	19,030	28,500	—1,930	5,910	0	0	320	9,150	July
203,830	19,030	12,120	—1,720	0	0	0	311	3,760	Aug.
181,160	18,410	10,800	—1,110	0	0	0	298	3,330	Sept.
158,640	19,030	7,000	— 410	0	0	0	286	2,000	Oct.
140,320	18,410	1,760	+ 140	3,360	0	0	275	500	Nov.
124,900	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	331,090	—6,240	504,940	0	0	294	8,200	Total or average
									1915
118,860	19,030	1,500	+ 490	0	0	0	265	400	Jan.
118,420	17,190	35,890	+ 300	10,640	0	0	273	10,890	Feb.
130,000	19,030	46,120	+ 390	0	0	0	268	12,370	Mar.
126,640	18,410	41,390	— 370	32,520	0	0	277	11,780	April
166,950	19,030	40,800	—1,070	115,050	0	0	312	12,810	May
209,000	18,410	45,460	—1,460	165,670	0	0	319	15,000	June
209,000	19,030	25,810	—1,930	4,020	0	0	320	8,280	July
202,210	19,030	5,710	—1,630	0	0	0	310	1,770	Aug.
181,550	18,410	6,370	—1,050	0	0	0	300	1,970	Sept.
162,090	19,030	3,000	— 400	0	0	0	289	860	Oct.
146,490	18,410	1,750	+ 130	8,870	0	0	276	500	Nov.
126,280	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	253,800	—6,210	336,770	0	0	293	6,340	Total or average
									1916
127,440	19,030	36,210	+ 490	21,990	0	0	273	9,890	Jan.
130,000	17,800	50,520	+ 400	29,880	0	0	273	14,740	Feb.
130,000	19,030	54,850	+ 430	101,550	0	0	273	15,000	Mar.
130,000	18,410	41,100	— 370	70,650	0	0	279	11,720	April
194,470	19,030	44,720	—1,070	83,920	41,730	0	320	14,330	May
209,000	18,410	45,460	—1,460	115,670	0	0	319	15,000	June
209,000	19,030	28,250	—1,930	1,690	0	0	320	9,090	July
205,000	19,030	12,750	—1,720	0	0	0	312	3,980	Aug.
182,000	18,410	9,720	—1,110	0	0	0	299	3,000	Sept.
159,480	19,030	6,000	— 410	0	0	0	288	1,730	Oct.
146,740	18,410	5,620	+ 140	8,880	0	0	277	1,710	Nov.
125,770	19,030	5,550	+ 400	0	0	0	272	1,510	Dec.
	224,650	340,750	—6,210	434,230	41,730	0	292	8,450	Total or average

TABLE 7a (Continued). PARDEE

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1917										
Jan.	20,000	144,240	19,030	19,500	+ 530	0	0	0	276	5,390
Feb.	69,400	126,240	17,190	17,750	+ 330	13,790	0	0	270	5,360
Mar.	59,500	147,240	19,030	28,180	+ 430	1,900	0	0	288	8,150
April	134,000	158,060	18,410	44,630	— 370	0	6,650	0	306	14,100
May	207,000	222,000	19,030	46,180	—1,070	59,840	85,440	0	325	15,000
June	264,000	217,440	18,410	44,750	—1,460	187,820	7,000	0	324	15,000
July	47,000	222,000	19,030	29,530	—1,930	0	6,000	0	324	9,580
Aug.	9,350	212,510	19,030	16,350	—1,720	0	0	0	314	5,130
Sept.	5,680	184,760	18,410	8,680	—1,110	0	0	0	301	2,690
Oct.	4,590	162,240	19,030	4,000	— 410	0	0	0	288	1,160
Nov.	5,110	143,390	18,410	0	+ 130	0	0	0	...	0
Dec.	3,230	130,220	19,030	0	+ 390	0	0	0	...	0
Total or average	828,860		224,040	259,550	—6,260	263,350	105,090	0	302	6,790
1918										
Jan.	3,170	114,810	19,030	1,500	+ 450	0	0	0	255	380
Feb.	19,400	97,900	17,190	9,760	+ 250	0	0	0	242	2,620
Mar.	106,000	90,600	19,030	15,000	+ 250	0	0	0	266	3,990
April	122,000	162,820	18,410	44,630	— 300	0	0	0	306	14,100
May	148,000	221,480	19,030	46,120	—1,070	0	81,260	0	325	15,000
June	87,500	222,000	18,410	37,660	—1,460	0	35,420	0	325	12,840
July	7,930	216,550	19,030	7,930	—1,930	0	0	0	317	2,510
Aug.	4,860	195,590	19,030	4,860	—1,550	0	0	0	307	1,490
Sept.	8,810	175,010	18,410	8,810	— 990	0	0	0	295	2,680
Oct.	13,700	155,610	19,030	3,000	— 390	0	0	0	287	860
Nov.	12,300	146,890	18,410	0	+ 130	0	0	0	...	0
Dec.	12,500	140,910	19,030	0	+ 390	0	0	0	...	0
Total or average	546,170		224,040	179,270	—6,220	0	116,680	0	293	4,680
1919										
Jan.	10,300	134,770	19,030	6,000	+ 470	0	0	0	271	1,630
Feb.	47,100	120,510	17,190	10,500	+ 280	0	0	0	272	3,150
Mar.	51,500	140,200	19,030	46,120	+ 310	0	0	0	273	12,590
April	146,000	126,860	18,410	44,630	— 280	0	0	0	291	13,400
May	247,000	209,540	19,030	46,120	—1,070	0	168,320	0	325	15,000
June	33,800	222,000	18,410	24,270	—1,460	0	3,250	0	323	8,130
July	5,560	208,410	19,030	5,560	—1,740	0	0	0	313	1,750
Aug.	4,930	187,640	19,030	4,930	—1,380	0	0	0	303	1,490
Sept.	5,180	167,230	18,410	5,180	— 930	0	0	0	291	1,560
Oct.	4,690	147,890	19,030	3,000	— 360	0	0	0	279	830
Nov.	5,270	130,190	18,410	0	+ 120	0	0	0	...	0
Dec.	11,800	117,170	19,030	0	+ 320	0	0	0	...	0
Total or average	573,130		224,040	196,310	—5,720	0	171,570	0	294	4,970
1920										
Jan.	7,810	110,260	19,030	1,500	+ 390	0	0	0	254	380
Feb.	8,230	97,930	17,800	2,500	+ 230	0	0	0	243	650
Mar.	43,600	86,090	19,030	19,380	+ 220	0	0	0	241	4,680
April	88,700	91,500	18,410	35,000	— 190	0	0	0	252	9,110
May	191,000	126,600	19,030	35,880	— 720	0	39,970	0	304	10,990
June	78,500	222,000	18,410	38,240	—1,460	0	24,370	0	325	12,830
July	13,800	218,020	19,030	13,800	—1,930	0	0	0	318	4,400
Aug.	5,840	197,060	19,030	5,840	—1,550	0	0	0	308	1,800
Sept.	4,840	176,480	18,410	4,840	— 990	0	0	0	296	1,490
Oct.	9,590	157,080	19,030	3,000	— 390	0	0	0	286	860
Nov.	19,900	144,250	18,410	0	+ 130	0	0	0	...	0
Dec.	34,500	145,870	19,030	0	+ 390	0	0	0	...	0
Total or average	506,310		224,650	159,980	—5,870	0	64,340	0	283	3,930

RESERVOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1917
129,190	19,030	19,500	+ 530	0	0	0	267	5,200	Jan.
111,190	17,190	20,380	+ 330	13,350	0	0	258	5,890	Feb.
130,000	19,030	46,440	+ 430	180	0	0	270	12,580	Mar.
124,280	18,410	38,190	— 370	19,860	0	0	278	10,880	April
181,450	19,030	42,770	—1,070	110,550	6,030	0	318	13,640	May
209,000	18,410	45,460	—1,460	198,670	0	0	319	15,000	June
209,000	19,030	26,260	—1,930	3,170	0	0	321	8,440	July
205,610	19,030	9,450	—1,720	0	0	0	312	2,960	Aug.
184,760	18,410	8,680	—1,110	0	0	0	301	2,690	Sept.
162,240	19,030	4,000	— 410	0	0	0	288	1,160	Oct.
143,390	18,410	1,760	+ 130	4,530	0	0	276	500	Nov.
123,930	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	262,890	—6,260	350,310	6,030	0	293	6,580	Total or average
									1918
108,520	19,030	1,500	+ 450	0	0	0	250	380	Jan.
91,610	17,190	7,900	+ 250	0	0	0	238	2,080	Feb.
86,170	19,030	30,900	+ 250	12,490	0	0	258	8,240	Mar.
130,000	18,410	44,610	— 300	17,330	0	0	278	12,750	April
171,350	19,030	41,810	—1,070	48,440	0	0	317	13,290	May
209,000	18,410	38,060	—1,460	35,040	0	0	319	12,580	June
203,530	19,030	7,930	—1,930	0	0	0	310	2,460	July
182,570	19,030	4,860	—1,550	0	0	0	300	1,450	Aug.
161,990	18,410	8,810	— 990	0	0	0	288	2,610	Sept.
142,590	19,030	3,000	— 390	0	0	0	278	830	Oct.
133,870	18,410	260	+ 130	0	0	0	273	70	Nov.
127,630	19,030	0	+ 390	0	0	0	...	0	Dec.
	224,040	189,640	—6,220	113,300	0	0	284	4,730	Total or average
									1919
121,490	19,030	6,000	+ 470	0	0	0	262	1,570	Jan.
107,230	17,190	10,500	+ 280	0	0	0	263	3,050	Feb.
126,920	19,030	46,120	+ 310	0	0	0	264	12,180	Mar.
113,580	18,410	42,940	— 280	11,920	0	0	278	12,250	April
186,030	19,030	45,210	—1,070	119,760	38,960	0	320	14,490	May
209,000	18,410	24,430	—1,460	3,100	0	0	317	8,080	June
195,400	19,030	5,560	—1,740	0	0	0	306	1,710	July
174,630	19,030	4,930	—1,380	0	0	0	295	1,450	Aug.
154,220	18,410	5,180	— 930	0	0	0	282	1,510	Sept.
134,880	19,030	3,000	— 360	0	0	0	270	810	Oct.
117,180	18,410	0	+ 120	0	0	0	...	0	Nov.
104,160	19,030	0	+ 320	0	0	0	...	0	Dec.
	224,040	193,870	—5,720	134,780	38,960	0	286	4,760	Total or average
									1920
97,250	19,030	1,500	+ 390	0	0	0	242	360	Jan.
84,920	17,800	2,500	+ 230	0	0	0	232	620	Feb.
73,080	19,030	19,380	+ 220	0	0	0	229	4,440	Mar.
78,490	18,410	33,160	— 190	0	0	0	241	8,250	April
115,430	19,030	36,580	— 720	41,100	0	0	296	10,980	May
209,000	18,410	38,650	—1,460	23,650	0	0	319	12,760	June
205,330	19,030	13,800	—1,930	0	0	0	312	4,300	July
184,370	19,030	5,840	—1,550	0	0	0	300	1,760	Aug.
163,790	18,410	4,840	— 990	0	0	0	289	1,440	Sept.
144,390	19,030	3,000	— 390	0	0	0	278	830	Oct.
131,560	18,410	3,180	+ 130	0	0	0	273	920	Nov.
130,000	19,030	14,990	+ 390	870	0	0	273	4,090	Dec.
	224,650	177,420	—5,870	65,620	0	0	274	4,230	Total or average

TABLE 7a (Continued). PARDEE

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1921										
Jan.	78,700	161,730	19,030	46,650	+ 530	40,060	0	0	283	13,200
Feb.	61,100	135,220	17,190	38,130	+ 420	4,710	0	0	275	11,620
Mar.	108,000	136,710	19,030	39,360	+ 430	15,090	0	0	287	10,970
April	123,000	171,660	18,410	32,610	— 370	21,270	0	0	314	10,400
May	218,000	222,000	19,030	46,320	—1,070	105,650	55,850	0	324	15,000
June	178,000	212,080	18,410	44,630	—1,460	106,950	0	0	322	14,850
July	20,400	218,630	19,030	16,740	—1,930	0	0	0	320	5,420
Aug.	7,750	201,330	19,030	7,750	—1,550	0	0	0	310	2,410
Sept.	5,710	180,750	18,410	5,710	— 990	0	0	0	299	1,760
Oct.	7,190	161,350	19,030	3,000	— 390	0	0	0	288	860
Nov.	4,530	146,120	18,410	0	+ 130	0	0	0	...	0
Dec.	10,900	132,370	19,030	0	+ 360	0	0	0	...	0
Total or average	823,280		224,040	280,900	—5,890	293,730	55,850	0	302	7,170
1922										
Jan.	19,200	124,600	19,030	1,500	+ 440	0	0	0	271	400
Feb.	58,900	123,710	17,190	8,450	+ 270	5,650	0	0	278	2,650
Mar.	56,500	151,590	19,030	32,800	+ 330	0	0	0	288	9,790
April	107,000	156,590	18,410	44,630	— 320	0	0	0	297	13,690
May	318,000	200,230	19,030	46,270	—1,070	178,710	57,990	0	323	14,970
June	280,000	215,160	18,410	44,940	—1,460	209,840	0	0	323	15,000
July	39,200	220,510	19,030	27,470	—1,930	530	3,010	0	323	8,900
Aug.	10,100	207,740	19,030	15,100	—1,630	0	0	0	312	4,720
Sept.	7,620	182,080	18,410	10,620	—1,050	0	0	0	299	3,280
Oct.	7,990	159,620	19,030	4,000	— 400	0	0	0	287	1,140
Nov.	10,700	144,180	18,410	0	+ 130	0	0	0	...	0
Dec.	58,800	136,600	19,030	0	+ 390	0	0	0	...	0
Total or average	974,010		224,040	235,780	—6,300	394,730	61,000	0	300	6,220
1923										
Jan.	46,200	176,760	19,030	44,710	+ 580	23,440	0	0	285	12,770
Feb.	33,300	136,360	17,190	19,260	+ 420	0	0	0	275	5,980
Mar.	43,300	133,270	19,030	46,120	+ 430	0	0	0	268	12,340
April	127,000	111,850	18,410	44,630	— 370	0	0	0	282	13,010
May	225,000	175,440	19,030	46,420	—1,070	113,000	10,520	0	319	14,790
June	104,000	210,400	18,410	44,760	—1,460	32,930	0	0	321	14,830
July	28,500	216,840	19,030	20,600	—1,930	0	0	0	321	6,670
Aug.	9,100	203,780	19,030	9,100	—1,550	0	0	0	311	2,840
Sept.	9,040	183,200	18,410	9,040	— 990	0	0	0	301	2,810
Oct.	9,410	163,800	19,030	3,000	— 390	0	0	0	291	870
Nov.	7,080	150,790	18,410	0	+ 120	0	0	0	...	0
Dec.	6,950	139,580	19,030	0	+ 350	0	0	0	...	0
Total or average	648,880		224,040	288,000	—5,860	169,370	10,520	0	297	7,250
1924										
Jan.	8,670	127,850	19,030	8,670	+ 390	0	0	0	265	2,300
Feb.	15,900	109,210	17,800	15,900	+ 210	0	0	0	250	4,250
Mar.	11,200	91,620	19,030	11,200	+ 200	0	0	0	235	2,620
April	53,100	72,790	18,410	30,000	— 140	0	0	0	224	6,940
May	60,900	77,340	19,030	31,000	— 420	0	0	0	243	7,530
June	4,210	87,790	18,410	4,210	— 640	0	0	0	231	1,000
July	1,220	68,740	19,030	1,220	— 690	0	0	0	210	260
Aug.	330	49,020	19,030	330	— 450	0	0	0	183	50
Sept.	2,980	29,540	4,480	2,980	— 270	0	0	13,930	160	490
Oct.	5,340	24,790	0	5,340	— 110	0	0	19,030	159	850
Nov.	18,200	24,680	0	18,200	+ 40	0	0	18,410	159	2,990
Dec.	24,600	24,720	9,430	10,950	+ 120	0	0	9,600	159	1,750
Total or average	206,650		163,680	140,000	—1,760	0	0	60,970	206	2,570

RESERVOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1921
130,000	19,030	38,820	+ 530	21,380	0	0	272	10,650	Jan.
130,000	17,190	43,470	+ 420	860	0	0	272	13,100	Feb.
130,000	19,030	54,910	+ 430	34,490	0	0	273	15,000	Mar.
130,000	18,410	43,140	— 370	18,340	0	0	277	12,280	April
172,740	19,030	41,820	—1,070	119,820	0	0	316	13,270	May
209,000	18,410	45,460	—1,460	112,670	0	0	319	15,000	June
209,000	19,030	17,630	—1,930	250	0	0	315	5,560	July
190,560	19,030	7,750	—1,550	0	0	0	304	2,350	Aug.
169,980	18,410	5,710	— 990	0	0	0	292	1,720	Sept.
150,580	19,030	3,000	— 390	0	0	0	282	850	Oct.
135,350	18,410	0	+ 130	0	0	0	...	0	Nov.
121,600	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	301,710	—5,890	307,810	0	0	292	7,440	Total or average
									1922
113,830	19,030	1,500	+ 440	0	0	0	263	400	Jan.
112,940	17,190	15,940	+ 270	8,980	0	0	268	4,790	Feb.
130,000	19,030	46,120	+ 330	0	0	0	266	12,230	Mar.
121,680	18,410	36,930	— 320	0	0	0	276	10,470	April
173,020	19,030	43,220	—1,070	192,240	25,820	0	318	13,800	May
209,640	18,410	45,450	—1,460	215,320	0	0	319	15,000	June
209,000	19,030	25,300	—1,930	2,870	0	0	319	8,080	July
199,070	19,030	10,100	—1,630	0	0	0	308	3,120	Aug.
178,410	18,410	7,620	—1,050	0	0	0	298	2,350	Sept.
158,950	19,030	3,330	— 400	0	0	0	286	950	Oct.
144,180	18,410	2,210	+ 130	8,860	0	0	275	630	Nov.
125,530	19,030	18,980	+ 390	16,710	0	0	273	5,160	Dec.
	224,040	256,700	—6,300	444,980	25,820	0	291	6,420	Total or average
									1923
130,000	19,030	46,120	+ 580	0	0	0	264	12,200	Jan.
111,630	17,190	41,650	+ 420	0	0	0	250	11,500	Feb.
86,510	19,030	46,120	+ 430	0	0	0	228	10,540	Mar.
65,090	18,410	34,500	— 370	0	0	0	248	8,610	April
138,810	19,030	40,790	—1,070	93,920	0	0	310	12,740	May
209,000	18,410	45,460	—1,460	38,670	0	0	319	15,000	June
209,000	19,030	22,210	—1,930	630	0	0	316	7,070	July
193,700	19,030	9,100	—1,550	0	0	0	306	2,780	Aug.
173,120	18,410	9,040	— 990	0	0	0	294	2,750	Sept.
153,720	19,030	3,000	— 390	0	0	0	284	850	Oct.
140,710	18,410	1,760	+ 120	2,820	0	0	274	500	Nov.
124,920	19,030	0	+ 350	0	0	0	...	0	Dec.
	224,040	299,750	—5,860	136,040	0	0	282	7,010	Total or average
									1924
113,190	19,030	8,670	+ 390	0	0	0	254	2,200	Jan.
94,550	17,800	15,900	+ 210	0	0	0	238	4,050	Feb.
76,960	19,030	11,200	+ 200	0	0	0	220	2,460	Mar.
58,130	18,410	30,000	— 140	0	0	0	207	6,400	April
62,680	19,030	31,000	— 420	0	0	0	229	7,030	May
73,130	18,410	4,210	— 640	0	0	0	216	940	June
54,080	19,030	1,220	— 690	0	0	0	190	230	July
34,360	9,150	330	— 450	0	0	9,880	159	30	Aug.
24,760	0	2,980	— 270	0	0	18,410	158	490	Sept.
24,490	0	5,340	— 110	0	0	19,030	158	850	Oct.
24,380	0	18,200	+ 40	0	0	18,410	158	2,970	Nov.
24,420	9,130	10,950	+ 120	0	0	9,900	159	1,850	Dec.
	149,020	140,000	—1,760	0	0	75,630	198	2,450	Total or average

TABLE 7a (Concluded). PARDEE

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 345 feet.
Capacity of reservoir 222,000 acre-feet.

Year and month	Run-off at Clements in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1925										
Jan.	22,500	29,060	19,030	1,500	+ 160	0	0	0	172	260
Feb.	107,000	31,190	17,190	2,500	+ 100	0	0	0	231	640
Mar.	81,800	118,600	19,030	13,500	+ 260	0	0	0	280	3,780
April	164,000	168,130	18,410	44,680	— 290	19,410	27,340	0	315	14,530
May	237,000	222,000	19,030	46,380	—1,070	108,600	72,430	0	323	15,000
June	124,000	211,490	18,410	43,870	—1,460	54,840	0	0	321	14,540
July	21,000	216,910	19,030	16,310	—1,930	0	0	0	320	5,230
Aug.	10,200	200,640	19,030	10,200	—1,490	0	0	0	310	3,160
Sept.	7,910	181,120	18,410	7,910	— 990	0	0	0	298	2,440
Oct.	5,560	160,720	19,030	3,000	— 390	0	0	0	288	860
Nov.	7,620	143,860	18,410	0	+ 130	0	0	0	...	0
Dec.	14,400	133,200	19,030	0	+ 360	0	0	0	...	0
Total or average	802,990		224,040	189,850	—6,610	182,850	99,770	0	286	5,040
Total for 21-year period, 1905-1926	17,355,000		4,646,920	5,358,630	122,650	5,145,700	2,098,030	60,970		
Average for 21-year period, 1905-1926	826,430		221,280	255,170	5,840	245,030	99,910	2,900	292	6,510

RESERVOIR ON MOKELUMNE RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

tions Carried out on a Daily Basis.

mary, see Table 7, page 126.)

Yield in municipal supply 200 million gallons daily.
Installed capacity of power plant 15,000 k.w.

Flood control, holding maximum reservoir space required (rain-water floods, 92,000 ac.-ft.: snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season
Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Municipal draft in acre-feet	Power draft through turbines including water passed for prior rights in acre-feet	Evaporation in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in municipal supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1925
29,060	19,030	1,500	+ 160	0	0	0	172	260	Jan.
31,190	17,190	2,500	+ 100	0	0	0	231	640	Feb.
118,600	19,030	41,070	+ 260	10,560	0	0	272	11,290	Mar.
130,000	18,410	42,570	— 290	65,210	0	0	278	12,140	April
167,520	19,030	43,750	—1,070	113,390	18,280	0	318	13,970	May
209,000	18,410	45,210	—1,460	58,920	0	0	319	14,920	June
209,000	19,030	16,620	—1,930	0	0	0	316	5,240	July
192,420	19,030	10,200	—1,490	0	0	0	306	3,120	Aug.
171,900	18,410	7,910	— 990	0	0	0	294	2,400	Sept.
152,500	19,030	3,000	— 390	0	0	0	282	850	Oct.
135,640	18,410	0	+ 130	0	0	0	...	0	Nov.
124,980	19,030	0	+ 360	0	0	0	...	0	Dec.
	224,040	214,330	—6,610	248,080	18,280	0	279	5,420	Total or average
	4,632,260	5,548,880	122,650	6,496,310	535,750	75,630			Total for 21-year period, 1905-1926
	220,580	264,230	5,840	309,350	25,510	3,600	283	6,450	Average for 21-year period, 1905-1926

TABLE 8a. PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)
1905									
Jan.	19,030	0	2,960	19,030	0	2,960	19,030	0	2,630
Feb.	17,190	0	7,100	17,190	0	7,100	17,190	0	6,320
Mar.	19,030	0	13,370	19,030	0	13,370	19,030	0	12,020
April	18,410	0	14,380	18,410	0	14,380	18,410	0	12,810
May	19,030	0	15,000	19,030	0	15,000	19,030	0	11,870
June	18,410	0	13,700	18,410	0	13,540	18,410	0	13,720
July	19,030	0	3,680	19,030	0	3,680	19,030	0	3,620
Aug.	19,030	0	2,430	19,030	0	2,420	19,030	0	2,370
Sept.	18,410	0	2,540	18,410	0	2,530	18,410	0	2,470
Oct.	19,030	0	860	19,030	0	860	19,030	0	830
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	6,320	224,040	0	6,300	224,040	0	5,700
1906									
Jan.	19,030	0	0	19,030	0	0	19,030	0	2,770
Feb.	17,190	0	13,050	17,190	0	13,020	17,190	0	12,160
Mar.	19,030	0	13,680	19,030	0	12,880	19,030	0	13,700
April	18,410	0	15,000	18,410	0	14,220	18,410	0	11,720
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,370
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	14,500	19,030	0	14,500	19,030	0	14,310
Aug.	19,030	0	10,130	19,030	0	10,130	19,030	0	10,130
Sept.	18,410	0	3,650	18,410	0	3,650	18,410	0	3,650
Oct.	19,030	0	1,920	19,030	0	1,920	19,030	0	1,920
Nov.	18,410	0	900	18,410	0	900	18,410	0	2,250
Dec.	19,030	0	1,470	19,030	0	3,370	19,030	0	5,390
Total or average	224,040	0	8,650	224,040	0	8,680	224,040	0	8,850
1907									
Jan.	19,030	0	14,010	19,030	0	14,050	19,030	0	12,820
Feb.	17,190	0	14,930	17,190	0	15,000	17,190	0	15,000
Mar.	19,030	0	15,000	19,030	0	14,950	19,030	0	15,000
April	18,410	0	15,000	18,410	0	15,000	18,410	0	11,780
May	19,030	0	15,000	19,030	0	15,000	19,030	0	15,000
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	15,000	19,030	0	15,000	19,030	0	14,810
Aug.	19,030	0	10,130	19,030	0	10,130	19,030	0	10,130
Sept.	18,410	0	9,810	18,410	0	9,810	18,410	0	9,810
Oct.	19,030	0	2,840	19,030	0	2,840	19,030	0	2,840
Nov.	18,410	0	2,710	18,410	0	2,710	18,410	0	3,900
Dec.	19,030	0	860	19,030	0	860	19,030	0	810
Total or average	224,040	0	10,820	224,040	0	10,820	224,040	0	10,560

TABLE 8a (Continued). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1908									
Jan.	19,030	0	3,580	19,030	0	3,580	19,030	0	3,350
Feb.	17,800	0	8,510	17,800	0	8,510	17,800	0	7,960
Mar.	19,030	0	10,090	19,030	0	10,090	19,030	0	8,410
April	18,410	0	12,780	18,410	0	12,780	18,410	0	10,670
May	19,030	0	14,300	19,030	0	14,300	19,030	0	9,560
June	18,410	0	13,500	18,410	0	13,500	18,410	0	13,420
July	19,030	0	4,500	19,030	0	4,500	19,030	0	4,410
Aug.	19,030	0	1,980	19,030	0	1,980	19,030	0	1,940
Sept.	18,410	0	2,470	18,410	0	2,470	18,410	0	2,400
Oct.	19,030	0	860	19,030	0	860	19,030	0	830
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,650	0	6,020	224,650	0	6,020	224,650	0	5,220
1909									
Jan.	19,030	0	5,590	19,030	0	6,530	19,030	0	8,880
Feb.	17,190	0	15,000	17,190	0	15,000	17,190	0	15,000
Mar.	19,030	0	15,000	19,030	0	11,770	19,030	0	15,000
April	18,410	0	15,000	18,410	0	11,750	18,410	0	12,090
May	19,030	0	15,000	19,030	0	15,000	19,030	0	14,150
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	10,080	19,030	0	9,770	19,030	0	9,050
Aug.	19,030	0	5,350	19,030	0	5,350	19,030	0	2,550
Sept.	18,410	0	2,350	18,410	0	2,350	18,410	0	2,350
Oct.	19,030	0	1,140	19,030	0	1,140	19,030	0	1,140
Nov.	18,410	0	0	18,410	0	0	18,410	0	5,490
Dec.	19,030	0	14,660	19,030	0	14,800	19,030	0	13,660
Total or average	224,040	0	9,480	224,040	0	9,010	224,040	0	9,490
1910									
Jan.	19,030	0	14,920	19,030	0	13,170	19,030	0	13,710
Feb.	17,190	0	14,930	17,190	0	9,850	17,190	0	12,600
Mar.	19,030	0	14,970	19,030	0	13,640	19,030	0	14,600
April	18,410	0	15,000	18,410	0	13,860	18,410	0	13,030
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,840
June	18,410	0	11,140	18,410	0	10,920	18,410	0	11,110
July	19,030	0	3,360	19,030	0	3,290	19,030	0	3,280
Aug.	19,030	0	1,210	19,030	0	1,180	19,030	0	1,180
Sept.	18,410	0	1,350	18,410	0	1,310	18,410	0	1,310
Oct.	19,030	0	850	19,030	0	820	19,030	0	820
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	7,070	224,040	0	6,900	224,040	0	7,090

TABLE 8a (Continued). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1911									
Jan.	19,030	0	2,430	19,030	0	5,090	19,030	0	7,470
Feb.	17,190	0	15,000	17,190	0	14,910	17,190	0	14,960
Mar.	19,030	0	15,000	19,030	0	15,000	19,030	0	15,000
April	18,410	0	15,000	18,410	0	15,000	18,410	0	11,740
May	19,030	0	15,000	19,030	0	15,000	19,030	0	14,090
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	13,130	19,030	0	13,130	19,030	0	12,620
Aug.	19,030	0	8,360	19,030	0	8,360	19,030	0	8,360
Sept.	18,410	0	3,580	18,410	0	3,580	18,410	0	3,580
Oct.	19,030	0	1,170	19,030	0	1,170	19,030	0	1,170
Nov.	18,410	0	0	18,410	0	0	18,410	0	1,000
Dec.	19,030	0	550	19,030	0	550	19,030	0	540
Total or average	224,040	0	8,630	224,040	0	8,850	224,040	0	8,750
1912									
Jan.	19,030	0	790	19,030	0	790	19,030	0	750
Feb.	17,800	0	2,260	17,800	0	2,260	17,800	0	2,140
Mar.	19,030	0	5,980	19,030	0	5,980	19,030	0	5,630
April	18,410	0	8,040	18,410	0	8,040	18,410	0	7,170
May	19,030	0	7,650	19,030	0	7,650	19,030	0	7,190
June	18,410	0	10,920	18,410	0	10,920	18,410	0	10,600
July	19,030	0	3,150	19,030	0	3,150	19,030	0	3,080
Aug.	19,030	0	1,720	19,030	0	1,720	19,030	0	1,680
Sept.	18,410	0	2,010	18,410	0	2,010	18,410	0	1,960
Oct.	19,030	0	860	19,030	0	860	19,030	0	830
Nov.	18,410	0	0	18,410	0	0	18,410	0	510
Dec.	19,030	0	3,090	19,030	0	3,090	19,030	0	2,920
Total or average	224,650	0	3,870	224,650	0	3,870	224,650	0	3,700
1913									
Jan.	19,030	0	690	19,030	0	690	19,030	0	650
Feb.	17,190	0	5,540	17,190	0	5,540	17,190	0	5,180
Mar.	19,030	0	8,760	19,030	0	8,760	19,030	0	8,010
April	18,410	0	8,930	18,410	0	8,930	18,410	0	7,750
May	19,030	0	9,370	19,030	0	9,370	19,030	0	8,600
June	18,410	0	10,790	18,410	0	10,790	18,410	0	9,040
July	19,030	0	3,320	19,030	0	3,320	19,030	0	3,250
Aug.	19,030	0	2,550	19,030	0	2,550	19,030	0	2,490
Sept.	18,410	0	1,930	18,410	0	1,930	18,410	0	1,880
Oct.	19,030	0	850	19,030	0	850	19,030	0	820
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	4,370	224,040	0	4,370	224,040	0	3,950

TABLE 8a (Continued). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1914									
Jan.	19,030	0	3,270	19,030	0	11,160	19,030	0	12,030
Feb.	17,190	0	15,000	17,190	0	12,920	17,190	0	13,660
Mar.	19,030	0	15,000	19,030	0	12,840	19,030	0	15,000
April	18,410	0	15,000	18,410	0	13,060	18,410	0	11,440
May	19,030	0	15,000	19,030	0	15,000	19,030	0	12,930
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	10,160	19,030	0	10,130	19,030	0	9,150
Aug.	19,030	0	6,330	19,030	0	6,330	19,030	0	3,760
Sept.	18,410	0	3,330	18,410	0	3,330	18,410	0	3,330
Oct.	19,030	0	2,000	19,030	0	2,000	19,030	0	2,000
Nov.	18,410	0	0	18,410	0	0	18,410	0	500
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	8,280	224,040	0	8,450	224,040	0	8,200
1915									
Jan.	19,030	0	400	19,030	0	400	19,030	0	400
Feb.	17,190	0	4,270	17,190	0	6,860	17,190	0	10,890
Mar.	19,030	0	13,490	19,030	0	5,480	19,030	0	12,370
April	18,410	0	14,310	18,410	0	14,310	18,410	0	11,780
May	19,030	0	15,000	19,030	0	15,000	19,030	0	12,810
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	9,300	19,030	0	9,130	19,030	0	8,280
Aug.	19,030	0	3,050	19,030	0	3,050	19,030	0	1,770
Sept.	18,410	0	2,920	18,410	0	2,920	18,410	0	1,970
Oct.	19,030	0	1,160	19,030	0	1,160	19,030	0	860
Nov.	18,410	0	0	18,410	0	0	18,410	0	500
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	6,580	224,040	0	6,080	224,040	0	6,340
1916									
Jan.	19,030	0	1,900	19,030	0	8,510	19,030	0	9,890
Feb.	17,800	0	14,740	17,800	0	14,470	17,800	0	14,740
Mar.	19,030	0	15,000	19,030	0	14,990	19,030	0	15,000
April	18,410	0	15,000	18,410	0	14,510	18,410	0	11,720
May	19,030	0	15,000	19,030	0	15,000	19,030	0	14,330
June	18,410	0	15,000	18,410	0	14,970	18,410	0	15,000
July	19,030	0	10,500	19,030	0	9,850	19,030	0	9,090
Aug.	19,030	0	6,100	19,030	0	6,100	19,030	0	3,980
Sept.	18,410	0	3,000	18,410	0	3,000	18,410	0	3,000
Oct.	19,030	0	1,730	19,030	0	1,730	19,030	0	1,730
Nov.	18,410	0	1,170	18,410	0	1,170	18,410	0	1,710
Dec.	19,030	0	280	19,030	0	280	19,030	0	1,510
Total or average	224,650	0	8,240	224,650	0	8,690	224,650	0	8,450

TABLE 8a (Continued). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1917									
Jan.	19,030	0	5,390	19,030	0	5,390	19,030	0	5,200
Feb.	17,190	0	4,640	17,190	0	5,360	17,190	0	5,890
Mar.	19,030	0	13,430	19,030	0	8,150	19,030	0	12,580
April	18,410	0	14,100	18,410	0	14,100	18,410	0	10,880
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,640
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	9,580	19,030	0	9,580	19,030	0	8,440
Aug.	19,030	0	5,130	19,030	0	5,130	19,030	0	2,960
Sept.	18,410	0	2,690	18,410	0	2,690	18,410	0	2,690
Oct.	19,030	0	1,160	19,030	0	1,160	19,030	0	1,160
Nov.	18,410	0	0	18,410	0	0	18,410	0	500
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	7,190	224,040	0	6,790	224,040	0	6,580
1918									
Jan.	19,030	0	380	19,030	0	380	19,030	0	380
Feb.	17,190	0	2,620	17,190	0	2,620	17,190	0	2,080
Mar.	19,030	0	3,990	19,030	0	3,990	19,030	0	8,240
April	18,410	0	14,100	18,410	0	14,100	18,410	0	12,750
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,290
June	18,410	0	12,640	18,410	0	12,640	18,410	0	12,580
July	19,030	0	2,510	19,030	0	2,510	19,030	0	2,460
Aug.	19,030	0	1,490	19,030	0	1,490	19,030	0	1,450
Sept.	18,410	0	2,690	18,410	0	2,690	18,410	0	2,610
Oct.	19,030	0	860	19,030	0	860	19,030	0	830
Nov.	18,410	0	0	18,410	0	0	18,410	0	70
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	4,680	224,040	0	4,680	224,040	0	4,730
1919									
Jan.	19,030	0	1,630	19,030	0	1,630	19,030	0	1,570
Feb.	17,190	0	3,150	17,190	0	3,150	17,190	0	3,050
Mar.	19,030	0	12,590	19,030	0	12,590	19,030	0	12,180
April	18,410	0	13,400	18,410	0	13,400	18,410	0	12,250
May	19,030	0	15,000	19,030	0	15,000	19,030	0	14,490
June	18,410	0	8,130	18,410	0	8,130	18,410	0	8,080
July	19,030	0	1,750	19,030	0	1,750	19,030	0	1,710
Aug.	19,030	0	1,490	19,030	0	1,490	19,030	0	1,450
Sept.	18,410	0	1,560	18,410	0	1,560	18,410	0	1,510
Oct.	19,030	0	830	19,030	0	830	19,030	0	810
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	4,970	224,040	0	4,970	224,040	0	4,760

TABLE 8a (Continued). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS
BOTH
WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily.
Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1920									
Jan.	19,030	0	380	19,030	0	380	19,030	0	360
Feb.	17,800	0	650	17,800	0	650	17,800	0	620
Mar.	19,030	0	4,680	19,030	0	4,680	19,030	0	4,440
April	18,410	0	9,110	18,410	0	9,110	18,410	0	8,250
May	19,030	0	10,990	19,030	0	10,990	19,030	0	10,980
June	18,410	0	12,830	18,410	0	12,830	18,410	0	12,760
July	19,030	0	4,400	19,030	0	4,400	19,030	0	4,300
Aug.	19,030	0	1,800	19,030	0	1,800	19,030	0	1,760
Sept.	18,410	0	1,490	18,410	0	1,490	18,410	0	1,440
Oct.	19,030	0	860	19,030	0	860	19,030	0	830
Nov.	18,410	0	0	18,410	0	0	18,410	0	920
Dec.	19,030	0	0	19,030	0	0	19,030	0	4,090
Total or average	224,650	0	3,930	224,650	0	3,930	224,650	0	4,230
1921									
Jan.	19,030	0	7,630	19,030	0	13,200	19,030	0	10,650
Feb.	17,190	0	14,420	17,190	0	11,620	17,190	0	13,100
Mar.	19,030	0	14,910	19,030	0	10,970	19,030	0	15,000
April	18,410	0	15,000	18,410	0	10,400	18,410	0	12,280
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,270
June	18,410	0	15,000	18,410	0	14,850	18,410	0	15,000
July	19,030	0	5,690	19,030	0	5,420	19,030	0	5,560
Aug.	19,030	0	2,410	19,030	0	2,410	19,030	0	2,350
Sept.	18,410	0	1,780	18,410	0	1,760	18,410	0	1,720
Oct.	19,030	0	870	19,030	0	860	19,030	0	850
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	7,660	224,040	0	7,170	224,040	0	7,440
1922									
Jan.	19,030	0	400	19,030	0	400	19,030	0	400
Feb.	17,190	0	940	17,190	0	2,650	17,190	0	4,790
Mar.	19,030	0	13,310	19,030	0	9,790	19,030	0	12,230
April	18,410	0	13,690	18,410	0	13,690	18,410	0	10,470
May	19,030	0	14,970	19,030	0	14,970	19,030	0	13,800
June	18,410	0	15,000	18,410	0	15,000	18,410	0	15,000
July	19,030	0	8,900	19,030	0	8,900	19,030	0	8,080
Aug.	19,030	0	4,720	19,030	0	4,720	19,030	0	3,120
Sept.	18,410	0	3,280	18,410	0	3,280	18,410	0	2,350
Oct.	19,030	0	1,140	19,030	0	1,140	19,030	0	950
Nov.	18,410	0	0	18,410	0	0	18,410	0	630
Dec.	19,030	0	0	19,030	0	0	19,030	0	5,160
Total or average	224,040	0	6,390	224,040	0	6,220	224,040	0	6,420

TABLE 8a (Concluded). PARDEE RESERVOIR ON MOKELUMNE RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 6a and 7a.

(For corresponding yearly summary, see Table 8, page 128.)

Height of dam 345 feet. Yield in municipal supply 200 million gallons daily. Capacity of reservoir 222,000 ac.-ft. Installed capacity of power plant 15,000 k.w.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft. Maximum reservoir space required—rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.			Flood control, holding maximum reservoir space (rain-water floods, 92,000 ac.-ft.; snow-water floods, 13,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Clements—rain-water floods, 5,300 sec.-ft.; snow-water floods, 7,100 sec.-ft.		
	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)	Municipal draft in acre-feet	Deficiency in municipal supply in acre-feet	Average power yield in kilowatts (Load factor=1.00)
1923									
Jan.	19,030	0	13,560	19,030	0	12,770	19,030	0	12,200
Feb.	17,190	0	13,050	17,190	0	5,980	17,190	0	11,500
Mar.	19,030	0	12,340	19,030	0	12,340	19,030	0	10,540
April	18,410	0	13,010	18,410	0	13,010	18,410	0	8,610
May	19,030	0	14,790	19,030	0	14,790	19,030	0	12,740
June	18,410	0	15,000	18,410	0	14,830	18,410	0	15,000
July	19,030	0	7,330	19,030	0	6,670	19,030	0	7,070
Aug.	19,030	0	2,850	19,030	0	2,840	19,030	0	2,780
Sept.	18,410	0	2,820	18,410	0	2,810	18,410	0	2,750
Oct.	19,030	0	870	19,030	0	870	19,030	0	850
Nov.	18,410	0	0	18,410	0	0	18,410	0	500
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	7,930	224,040	0	7,250	224,040	0	7,010
1924									
Jan.	19,030	0	2,310	19,030	0	2,300	19,030	0	2,200
Feb.	17,800	0	4,300	17,800	0	4,250	17,800	0	4,050
Mar.	19,030	0	2,650	19,030	0	2,620	19,030	0	2,460
April	18,410	0	6,970	18,410	0	6,940	18,410	0	6,400
May	19,030	0	7,580	19,030	0	7,530	19,030	0	7,030
June	18,410	0	1,010	18,410	0	1,000	18,410	0	940
July	19,030	0	260	19,030	0	260	19,030	0	230
Aug.	19,030	0	70	19,030	0	50	9,150	9,880	30
Sept.	6,770	11,640	500	4,480	13,930	490	0	18,410	490
Oct.	0	19,030	850	0	19,030	850	0	19,030	850
Nov.	0	18,410	2,990	0	18,410	2,990	0	18,410	2,970
Dec.	9,470	9,560	1,750	9,430	9,600	1,750	9,130	9,900	1,850
Total or average	166,010	58,640	2,590	163,680	60,970	2,570	149,020	75,630	2,450
1925									
Jan.	19,030	0	260	19,030	0	260	19,030	0	260
Feb.	17,190	0	640	17,190	0	640	17,190	0	640
Mar.	19,030	0	3,780	19,030	0	3,780	19,030	0	11,290
April	18,410	0	14,530	18,410	0	14,530	18,410	0	12,140
May	19,030	0	15,000	19,030	0	15,000	19,030	0	13,970
June	18,410	0	15,000	18,410	0	14,540	18,410	0	14,920
July	19,030	0	5,390	19,030	0	5,230	19,030	0	5,240
Aug.	19,030	0	3,190	19,030	0	3,160	19,030	0	3,120
Sept.	18,410	0	2,470	18,410	0	2,440	18,410	0	2,400
Oct.	19,030	0	870	19,030	0	860	19,030	0	850
Nov.	18,410	0	0	18,410	0	0	18,410	0	0
Dec.	19,030	0	0	19,030	0	0	19,030	0	0
Total or average	224,040	0	5,100	224,040	0	5,040	224,040	0	5,420
Total for 21-year period, 1905-1926	4,649,250	58,640		4,646,920	60,970		4,632,260	75,630	
Average for 21-year period, 1905-1926	221,390	2,790	6,640	221,280	2,900	6,510	220,580	3,600	6,450

ASSUMPTIONS EMPLOYED IN COMPUTING WATER AND POWER YIELD OF TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER ON A DAILY BASIS.

1. The water supply at the dam site is the same as that measured at the Friant gaging station of the United States Geological Survey and published or in preparation for publication, as mean daily discharges in the Water Supply Papers. No deductions were made for down-stream prior rights.

2. The reservoir is full on June 1, 1907, the opening date of the estimates. The run-off index for the season 1906–1907 is 156. The reservoir fills in 1917 with a run-off index of 94.

3. The net evaporation from the reservoir surface equals 4.0 feet depth per annum, divided among the months as follows:

Month	*Depth in feet*	*Per cent of seasonal total*
April	0.37	9.2
May	0.50	12.6
June	0.60	15.0
July	0.71	17.8
August	0.66	16.6
September	0.51	12.7
October	0.39	9.6
November	0.26	6.5
Totals	4.00	100.0

4. The total seasonal draft from the reservoir for irrigation is divided among the months as follows: (The summer peak of the irrigation demand is carried by pumping from wells.)

Month	*Demand in per cent of total seasonal use*
January	0.0
February	2.6
March	6.6
April	14.5
May	14.5
June	14.5
July	14.5
August	14.5
September	13.1
October	5.2
November	0.0
December	0.0
Total	100.0

5. The seasonal irrigation yield is that which can be obtained from the reservoir during the period 1872–1925 with a deficiency, when supplemented by pumping from ground water, not oftener on the average than one year in 18.

6. Power is generated in a plant at the base of the dam with water drawn from the reservoir for irrigation and with reservoir spill. The load factor is 1.00 and the power factor 0.80.

7. Secondary power is intermittent power.

8. The overall plant efficiency increases from 75.0 per cent at full reservoir to 78.7 per cent at 0.8 depth and then decreases to 73.5 per cent at 0.5 depth.

9. The elevation of the tail race rises 18 feet when 20,000 second-feet are passing the dam, 13 feet when 10,000 second-feet are passing, 8 feet when 5000 second-feet are passing, and corresponding amounts for other flows.

TABLE 9a TEMPERANCE FLAT RESER

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1908									
Jan.	53,100	797,100	0	0	0	0	0	...	0
Feb.	58,100	850,200	47,000	0	47,000	0	0	548	29,200
Mar.	120,000	861,300	119,000	0	119,000	0	0	543	68,400
April	199,000	862,300	261,000	1,700	261,000	0	0	530	152,400
May	219,000	798,600	261,000	2,200	261,000	0	0	522	145,800
June	176,000	754,400	261,000	2,600	261,000	0	0	507	146,900
July	119,000	666,800	261,000	2,800	261,000	0	0	478	135,100
Aug.	73,200	522,000	261,000	2,300	261,000	0	0	429	121,100
Sept.	39,000	331,900	236,000	1,300	228,100	0	0	347	86,800
Oct.	23,900	133,600	93,000	600	0	0	0	...	0
Nov.	16,200	63,900	0	200	0	0	0	...	0
Dec.	18,500	79,900	0	0	0	0	0	...	0
Total or average	1,115,000		1,800,000	13,700	1,699,100	0	0	488	72,800
1909									
Jan.	277,000	98,400	0	0	0	0	0	...	0
Feb.	183,000	375,400	47,000	0	47,000	0	0	438	24,700
Mar.	133,000	511,400	119,000	0	119,000	0	0	460	59,300
April	352,000	525,400	261,000	1,300	261,000	0	0	459	134,200
May	646,000	615,100	261,000	1,900	261,000	0	0	531	147,700
June	827,000	998,200	261,000	3,100	265,400	485,700	0	574	164,200
July	309,000	1,071,000	261,000	3,800	268,000	82,900	0	578	161,000
Aug.	78,100	1,025,300	261,000	3,500	261,000	0	0	554	152,400
Sept.	37,000	838,900	236,000	2,400	236,000	0	0	512	134,200
Oct	25,000	637,500	93,000	1,500	93,000	0	0	482	48,500
Nov.	49,600	568,000	0	900	0	0	0	...	0
Dec.	220,000	616,700	0	0	0	0	0	...	0
Total or average	3,136,700		1,800,000	18,400	1,811,400	568,600	0	510	85,800
1910									
Jan.	188,000	836,700	0	0	0	0	0	...	0
Feb.	86,600	1,024,700	47,000	0	47,000	0	0	586	31,500
Mar.	188,000	1,064,300	119,000	0	181,300	0	0	584	109,700
April	375,000	1,071,000	261,000	2,000	262,400	110,600	0	580	163,500
May	475,000	1,071,000	261,000	2,700	273,300	199,000	0	579	164,400
June	237,000	1,071,000	261,000	3,200	261,600	37,700	0	578	162,600
July	99,600	1,005,500	261,000	3,700	261,000	0	0	554	152,300
Aug.	39,600	840,400	261,000	3,100	261,000	0	0	509	142,900
Sept.	51,700	615,900	236,000	1,900	236,000	0	0	456	120,400
Oct.	29,600	429,700	93,000	1,200	93,000	0	0	419	42,200
Nov.	24,000	365,100	0	700	0	0	0	---	0
Dec.	31,400	388,400	0	0	0	0	0	...	0
Total or average	1,825,500		1,800,000	18,500	1,876,600	347,300	0	538	91,100
1911									
Jan.	239,000	419,800	0	0	0	0	0	...	0
Feb.	207,000	658,800	47,000	0	47,000	0	0	526	29,200
Mar.	336,000	818,800	119,000	0	119,000	0	0	558	69,900
April	425,000	1,035,800	261,000	1,900	264,000	123,900	0	578	164,300
May	571,000	1,071,000	261,000	2,700	273,400	294,900	0	578	164,400
June	946,000	1,071,000	261,000	3,200	265,600	677,200	0	575	164,400
July	593,000	1,071,000	261,000	3,800	272,700	320,500	0	576	163,400
Aug.	116,000	1,067,000	261,000	3,500	261,000	0	0	569	155,200
Sept.	45,500	918,500	236,000	2,400	236,000	0	0	532	138,200
Oct.	32,300	725,600	93,000	1,600	93,000	0	0	507	50,700
Nov.	28,000	663,300	0	1,000	0	0	0	...	0
Dec.	23,400	690,300	0	0	0	0	0	...	0
Total or average	3,562,200		1,800,000	20,100	1,831,700	1,416,500	0	556	91,900

VOIR ON SAN JOAQUIN RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9, page 134.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.
Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1908
797,100	0	0	0	0	0	0	...	0	Jan.
850,200	47,000	0	47,000	0	0	0	548	29,200	Feb.
861,300	119,000	0	119,000	0	0	0	543	68,400	Mar.
862,300	261,000	1,700	261,000	0	0	0	530	152,400	April
798,600	261,000	2,200	261,000	0	0	0	522	145,800	May
754,400	261,000	2,600	261,000	0	0	0	507	146,900	June
666,800	261,000	2,800	261,000	0	0	0	478	135,100	July
522,000	261,000	2,300	261,000	0	0	0	429	121,100	Aug.
331,900	236,000	1,300	228,100	0	0	0	347	86,800	Sept.
133,600	93,000	600	0	0	0	0	...	0	Oct.
63,900	0	200	0	0	0	0	...	0	Nov.
79,900	0	0	0	0	0	0	...	0	Dec.
	1,800,000	13,700	1,699,100	0	0	0	488	73,800	Total or average
									1909
98,400	0	0	0	0	0	0	...	0	Jan.
375,400	47,000	0	47,000	0	0	0	438	24,700	Feb.
511,400	119,000	0	119,000	0	0	0	460	59,300	Mar.
525,400	261,000	1,300	261,000	0	0	0	459	134,200	April
615,100	261,000	1,900	266,400	86,700	0	0	529	150,300	May
906,100	261,000	2,900	273,000	484,800	0	0	553	164,400	June
972,400	261,000	3,600	263,900	34,400	0	0	568	156,600	July
979,500	261,000	3,400	261,000	0	0	0	543	150,300	Aug.
793,200	236,000	2,300	236,000	0	0	0	500	131,400	Sept.
591,900	93,000	1,500	93,000	0	0	0	468	47,200	Oct.
522,400	0	900	0	0	0	0	...	0	Nov.
571,100	0	0	0	0	0	0	...	0	Dec.
	1,800,000	17,800	1,820,300	605,900	0	0	503	85,100	Total or average
									1910
791,100	0	0	0	0	0	0	...	0	Jan.
979,100	47,000	0	87,600	900	0	0	567	57,600	Feb.
977,200	119,000	0	123,200	0	0	0	574	73,800	Mar.
1,042,000	261,000	1,900	262,200	33,800	66,500	0	576	162,600	April
1,052,600	261,000	2,700	280,900	328,800	0	0	556	164,400	May
915,200	261,000	2,900	263,300	37,800	0	0	547	157,400	June
848,200	261,000	3,300	261,000	0	0	0	520	145,200	July
683,500	261,000	2,700	261,000	0	0	0	469	132,700	Aug.
459,400	236,000	1,600	236,000	0	0	0	398	104,900	Sept.
273,500	93,000	900	93,000	0	0	0	357	35,500	Oct.
209,200	0	500	0	0	0	0	...	0	Nov.
232,700	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,500	1,868,200	401,300	66,500	0	506	86,200	Total or average
									1911
264,100	0	0	0	0	0	0	...	0	Jan.
503,100	47,000	0	47,000	0	0	0	489	27,500	Feb.
663,100	119,000	0	119,000	0	0	0	525	66,700	Mar.
880,100	261,000	1,800	261,000	0	0	0	561	158,900	April
1,042,300	261,000	2,600	280,000	430,500	0	0	557	164,000	May
900,200	261,000	2,900	272,300	541,900	0	0	555	164,400	June
1,029,100	261,000	3,700	273,100	203,700	74,600	0	574	163,300	July
1,067,000	261,000	3,500	261,000	0	0	0	569	155,200	Aug.
918,500	236,000	2,400	236,000	0	0	0	532	138,200	Sept.
725,600	93,000	1,600	93,000	0	0	0	507	50,700	Oct.
663,300	0	1,000	0	0	0	0	...	0	Nov.
690,300	0	0	0	0	0	0	..	0	Dec.
	1,800,000	19,500	1,842,400	1,176,100	74,600	0	542	91,000	Total or average

TABLE 9a (Continued). TEMPERANCE FLAT

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1912									
Jan.	30,100	713,700	0	0	0	0	0	...	0
Feb.	26,600	743,800	47,000	0	47,000	0	0	521	28,000
Mar.	55,200	723,400	119,000	0	119,000	0	0	505	64,700
April	75,000	659,600	261,000	1,500	261,000	0	0	468	136,700
May	255,000	472,100	261,000	1,600	261,000	0	0	431	121,800
June	368,000	464,500	261,000	1,900	261,000	0	0	472	137,900
July	95,300	569,600	261,000	2,600	261,000	0	0	445	125,800
Aug.	38,000	401,300	261,000	1,900	261,000	0	0	367	102,700
Sept.	22,400	176,400	198,100	700	39,300	0	37,900	305	12,800
Oct.	17,800	0	17,800	0	0	0	75,200	...	0
Nov.	20,300	0	0	0	0	0	0	...	0
Dec.	20,000	20,300	0	0	0	0	0	...	0
Total or average	1,023,700		1,686,900	10,200	1,510,300	0	113,100	454	60,900
1913									
Jan.	22,100	40,300	0	0	0	0	0	...	0
Feb.	25,700	62,400	47,000	0	0	0	0	...	0
Mar.	38,200	41,100	79,300	0	0	0	39,700	...	0
April	95,800	0	95,800	0	0	0	165,200	...	0
May	247,000	0	219,200	0	0	0	41,800	...	0
June	170,000	27,800	197,700	100	0	0	63,300	...	0
July	102,000	0	102,000	0	0	0	159,000	...	0
Aug.	68,900	0	68,900	0	0	0	192,100	...	0
Sept.	40,600	0	40,600	0	0	0	195,400	...	0
Oct.	12,800	0	12,800	0	0	0	80,200	...	0
Nov.	22,300	0	0	0	0	0	0	...	0
Dec.	28,700	22,300	0	0	0	0	0	...	0
Total or average	874,100		863,300	100	0	0	936,700	0	0
1914									
Jan.	259,000	51,000	0	0	0	0	0	...	0
Feb.	145,000	310,000	47,000	0	47,000	0	0	404	22,800
Mar.	234,000	408,000	119,000	0	119,000	0	0	439	56,600
April	395,000	523,000	261,000	1,300	261,000	0	0	475	138,800
May	577,000	655,700	261,000	2,000	261,000	0	0	520	145,300
June	607,000	969,700	261,000	3,000	263,700	239,000	0	578	163,800
July	392,000	1,071,000	261,000	3,800	269,900	122,100	0	579	162,500
Aug.	142,000	1,067,200	261,000	3,500	261,000	0	0	573	156,100
Sept.	53,900	944,700	236,000	2,500	236,000	0	0	537	139,300
Oct.	40,300	760,100	93,000	1,700	93,000	0	0	514	51,300
Nov.	30,500	705,700	0	1,100	0	0	0	...	0
Dec.	29,600	735,100	0	0	0	0	0	...	0
Total or average	2,905,300		1,800,000	18,900	1,811,600	361,100	0	514	86,600
1915									
Jan.	38,200	764,700	0	0	0	0	0	...	0
Feb.	90,000	802,900	47,000	0	47,000	0	0	538	29,800
Mar.	124,000	845,900	119,000	0	119,000	0	0	539	68,100
April	246,000	850,900	261,000	1,700	261,000	0	0	533	153,100
May	381,000	834,200	261,000	2,300	261,000	0	0	541	149,900
June	586,000	951,900	261,009	3,000	263,400	200,500	0	577	163,300
July	287,000	1,071,000	261,000	3,800	266,900	49,900	0	579	160,800
Aug.	70,100	1,037,400	261,000	3,500	261,000	0	0	557	153,000
Sept.	44,300	843,000	236,000	2,400	236,000	0	0	514	134,600
Oct.	26,700	648,900	93,000	1,500	93,000	0	0	485	48,800
Nov.	23,400	581,100	0	1,000	0	0	0	...	0
Dec.	37,900	603,500	0	0	0	0	0	...	0
Total or average	1,954,600		1,800,000	19,200	1,808,300	250,400	0	540	88,700

RESERVOIR ON SAN JOAQUIN RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9, page 134.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft
Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac. ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1912
713,700	0	0	0	0	0	0	...	0	Jan.
743,800	47,000	0	47,000	0	0	0	521	28,000	Feb.
723,400	119,000	0	119,000	0	0	0	505	64,700	Mar.
659,600	261,000	1,500	261,000	0	0	0	468	136,700	April
472,100	261,000	1,600	261,000	0	0	0	431	121,800	May
464,500	261,000	1,900	261,000	0	0	0	472	137,900	June
569,600	261,000	2,600	261,000	0	0	0	445	125,800	July
401,300	261,000	1,900	261,000	0	0	0	367	102,700	Aug.
176,400	198,100	700	39,300	0	0	37,900	305	12,800	Sept.
0	17,800	0	0	0	0	75,200	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
20,300	0	0	0	0	0	0	...	0	Dec.
	1,686,900	10,200	1,510,300	0	0	113,100	454	60,900	Total or average
									1913
40,300	0	0	0	0	0	0	...	0	Jan.
62,400	47,000	0	0	0	0	0	...	0	Feb.
41,100	79,300	0	0	0	0	39,700	...	0	Mar.
0	95,800	0	0	0	0	165,200	...	0	April
0	219,200	0	0	0	0	41,800	...	0	May
27,800	197,700	100	0	0	0	63,300	...	0	June
0	102,000	0	0	0	0	159,000	...	0	July
0	68,900	0	0	0	0	192,100	...	0	Aug.
0	40,600	0	0	0	0	195,400	...	0	Sept.
0	12,800	0	0	0	0	80,200	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
22,300	0	0	0	0	0	0	...	0	Dec.
	863,300	100	0	0	0	936,700	0	0	Total or average
									1914
51,000	0	0	0	0	0	0	...	0	Jan.
310,000	47,000	0	47,000	0	0	0	404	22,800	Feb.
408,000	119,000	0	119,000	0	0	0	439	56,600	Mar.
523,000	261,000	1,300	261,000	0	0	0	475	138,800	April
655,700	261,000	2,000	264,300	66,800	0	0	519	146,800	May
899,600	261,000	2,900	275,100	264,900	0	0	547	164,400	June
963,700	261,000	3,600	265,000	26,200	0	0	574	158,600	July
1,060,900	261,000	3,500	261,000	0	0	0	573	156,100	Aug.
938,400	236,000	2,500	236,000	0	0	0	537	139,000	Sept.
753,800	93,000	1,700	93,000	0	0	0	513	51,200	Oct.
699,400	0	1,100	0	0	0	0	...	0	Nov.
728,800	0	0	0	0	0	0	...	0	Dec.
	1,800,000	18,600	1,821,400	357,900	0	0	510	86,400	Total or average
									1915
758,400	0	0	0	0	0	0	...	0	Jan.
796,600	47,000	0	47,000	0	0	0	537	29,600	Feb.
839,600	119,000	0	119,000	0	0	0	537	67,900	Mar.
844,600	261,000	1,700	261,000	0	0	0	532	152,800	April
827,900	261,000	2,300	264,100	44,300	0	0	538	151,100	May
898,200	261,000	2,900	275,200	241,300	0	0	547	164,400	June
964,800	261,000	3,600	263,300	2,100	0	0	568	156,500	July
982,800	261,000	3,400	261,000	0	0	0	545	150,700	Aug.
788,500	236,000	2,300	236,000	0	0	0	500	131,400	Sept.
594,500	93,000	1,500	93,000	0	0	0	466	47,000	Oct.
526,700	0	900	0	0	0	0	...	0	Nov.
549,200	0	0	0	0	0	0	...	0	Dec.
	1,800,000	18,600	1,819,600	287,700	0	0	530	87,800	Total or average

TABLE 9a (Continued). TEMPERANCE FLAT

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1916									
Jan.	173,000	641,400	0	0	0	0	0	...	0
Feb.	142,000	814,400	47,000	0	47,000	0	0	545	29,000
Mar.	338,000	909,400	119,000	0	162,100	14,300	0	571	97,000
April	477,000	1,071,000	261,000	2,000	264,000	211,000	0	580	164,400
May	552,000	1,071,000	261,000	2,700	273,300	276,000	0	578	164,400
June	572,000	1,071,000	261,000	3,200	264,800	304,000	0	578	164,400
July	289,000	1,071,000	261,000	3,800	267,600	44,300	0	580	161,300
Aug.	91,000	1,044,300	261,000	3,500	261,000	0	0	561	153,800
Sept.	44,900	870,800	236,000	2,400	236,000	0	0	520	135,800
Oct.	63,900	677,300	93,000	1,600	93,000	0	0	499	50,100
Nov.	38,900	646,600	0	1,000	0	0	0	...	0
Dec.	45,300	684,500	0	0	0	0	0	...	0
Total or average	2,827,000		1,800,000	20,200	1,868,800	849,600	0	557	93,500
1917									
Jan.	47,500	729,800	0	0	0	0	0	...	0
Feb.	129,000	777,300	47,000	0	47,000	0	0	531	29,500
Mar.	108,000	859,300	119,000	0	119,000	0	0	542	68,400
April	226,000	848,300	261,000	1,700	261,000	0	0	530	152,500
May	373,000	811,600	261,000	2,300	261,000	0	0	540	149,600
June	579,000	921,300	261,000	3,000	262,500	163,800	0	575	162,600
July	222,000	1,071,000	261,000	3,800	264,200	13,100	0	579	159,100
Aug.	72,600	1,011,900	261,000	3,400	261,000	0	0	553	152,200
Sept.	36,100	820,100	236,000	2,300	236,000	0	0	507	133,200
Oct.	25,400	617,900	93,000	1,500	93,000	0	0	477	48,000
Nov.	21,900	548,800	0	900	0	0	0	...	0
Dec.	19,600	569,800	0	0	0	0	0	...	0
Total or average	1,860,100		1,800,000	18,900	1,804,700	176,900	0	537	88,100
1918									
Jan.	20,500	589,400	0	0	0	0	0	...	0
Feb.	36,800	609,900	47,000	0	47,000	0	0	484	27,200
Mar.	149,000	599,700	119,000	0	119,000	0	0	483	62,200
April	179,000	629,700	261,000	1,400	261,000	0	0	477	139,300
May	307,000	546,300	261,000	1,800	261,000	0	0	470	132,900
June	494,000	590,500	261,000	2,200	261,000	0	0	510	147,800
July	121,000	821,300	261,000	3,400	261,000	0	0	517	144,600
Aug.	42,800	677,900	261,000	2,700	261,000	0	0	467	132,100
Sept.	48,700	457,000	236,000	1,600	236,000	0	0	403	106,100
Oct.	103,000	268,100	93,000	900	93,000	0	0	382	38,300
Nov.	44,000	277,200	0	600	0	0	0	...	0
Dec.	50,700	320,600	0	0	0	0	0	...	0
Total or average	1,596,500		1,800,000	14,600	1,800,000	0	0	466	77,700
1919									
Jan.	38,400	371,300	0	0	0	0	0	...	0
Feb.	68,900	409,700	47,000	0	47,000	0	0	430	24,300
Mar.	94,100	431,600	119,000	0	119,000	0	0	427	55,000
April	209,000	406,700	261,000	1,100	261,000	0	0	407	118,600
May	441,000	353,600	261,000	1,300	261,000	0	0	430	121,500
June	154,000	532,300	261,000	2,100	261,000	0	0	447	130,600
July	61,500	423,200	261,000	2,100	261,000	0	0	389	109,500
Aug.	30,400	221,600	250,300	1,700	92,600	0	10,700	320	30,800
Sept.	23,000	0	23,000	0	0	0	213,000	...	0
Oct.	22,400	0	22,400	0	0	0	70,600	...	0
Nov.	18,600	0	0	0	0	0	0	...	0
Dec.	30,100	18,600	0	0	0	0	0	...	0
Total or average	1,191,400		1,505,700	8,300	1,302,600	0	294,300	416	49,200

RESERVOIR ON SAN JOAQUIN RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9, page 134.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.
Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1916
587,100	0	0	0	0	0	0	...	0	Jan.
760,100	47,000	0	47,000	0	0	0	532	28,400	Feb.
855,100	119,000	0	122,100	0	0	0	562	72,000	Mar.
1,071,000	261,000	2,000	264,300	0	210,700	0	579	164,400	April
1,071,000	261,000	2,700	280,100	417,600	21,500	0	558	164,400	May
901,100	261,000	2,900	274,000	226,600	0	0	549	164,300	June
969,600	261,000	3,600	261,000	0	0	0	569	155,400	July
994,000	261,000	3,400	261,000	0	0	0	551	151,700	Aug.
820,600	236,000	2,300	236,000	0	0	0	509	133,300	Sept.
627,200	93,000	1,500	93,000	0	0	0	486	48,900	Oct.
596,600	0	1,000	0	0	0	0	...	0	Nov.
634,500	0	0	0	0	0	0	...	0	Dec.
	1,800,000	19,400	1,838,500	644,200	232,200	0	544	90,300	Total or average
									1917
679,800	0	0	0	0	0	0	...	0	Jan.
727,300	47,000	0	47,000	0	0	0	519	28,900	Feb.
809,300	119,000	0	119,000	0	0	0	531	67,300	Mar.
798,300	261,000	1,700	261,000	0	0	0	518	149,700	April
761,600	261,000	2,200	261,000	0	0	0	530	147,400	May
871,400	261,000	2,800	262,900	57,600	56,100	0	569	161,400	June
1,071,000	261,000	3,800	264,200	0	13,100	0	579	159,100	July
1,011,900	261,000	3,400	261,000	0	0	0	553	152,200	Aug.
820,100	236,000	2,300	236,000	0	0	0	507	133,200	Sept.
617,900	93,000	1,500	93,000	0	0	0	477	48,000	Oct.
548,800	0	900	0	0	0	0	...	0	Nov.
569,800	0	0	0	0	0	0	...	0	Dec.
	1,800,000	18,600	1,805,100	57,600	69,200	0	532	87,500	Total or average
									1918
589,400	0	0	0	0	0	0	...	0	Jan.
609,900	47,000	0	47,000	0	0	0	484	27,200	Feb.
599,700	119,000	0	119,000	0	0	0	483	62,200	Mar.
629,700	261,000	1,400	261,000	0	0	0	477	139,300	April
546,300	261,000	1,800	261,000	0	0	0	470	132,900	May
590,500	261,000	2,200	261,000	0	0	0	510	147,800	June
821,300	261,000	3,400	261,000	0	0	0	517	144,600	July
677,900	261,000	2,700	261,000	0	0	0	467	132,100	Aug.
457,000	236,000	1,600	236,000	0	0	0	403	106,100	Sept.
268,100	93,000	900	93,000	0	0	0	382	38,300	Oct.
277,200	0	600	0	0	0	0	...	0	Nov.
320,600	0	0	0	0	0	0	...	0	Dec.
	1,800,000	14,600	1,800,000	0	0	0	466	77,700	Total or average
									1919
371,300	0	0	0	0	0	0	...	0	Jan.
409,700	47,000	0	47,000	0	0	0	430	24,300	Feb.
431,600	119,000	0	119,000	0	0	0	427	55,000	Mar.
406,700	261,000	1,100	261,000	0	0	0	407	118,600	April
353,600	261,000	1,300	261,000	0	0	0	430	121,500	May
532,300	261,000	2,100	261,000	0	0	0	447	130,600	June
423,200	261,000	2,100	261,000	0	0	0	389	109,500	July
221,600	250,300	1,700	92,600	0	0	10,700	320	30,800	Aug.
0	23,000	0	0	0	0	213,000	...	0	Sept.
0	22,400	0	0	0	0	70,600	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
18,600	0	0	0	0	0	0	...	0	Dec.
	1,505,700	8,300	1,302,600	0	0	294,300	416	49,200	Total or average

TABLE 9a (Continued). TEMPERANCE FLAT

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1920									
Jan.	26,900	48,700	0	0	0	0	0	...	0
Feb.	28,900	75,600	47,000	0	0	0	0	...	0
Mar.	101,000	57,500	119,000	0	0	0	0	...	0
April	161,000	39,500	198,000	0	0	0	63,000	...	0
May	407,000	2,500	259,600	0	8,400	0	1,400	298	2,600
June	327,000	149,900	261,000	900	261,000	0	0	336	95,700
July	111,000	215,000	261,000	1,400	151,500	0	0	320	50,500
Aug.	45,400	63,600	108,900	100	0	0	152,100	...	0
Sept.	29,200	0	29,200	0	0	0	206,800	...	0
Oct.	37,000	0	37,000	0	0	0	56,000	...	0
Nov.	44,600	0	0	0	0	0	0	...	0
Dec.	43,000	44,600	0	0	0	0	0	...	0
Total or average	1,362,000		1,320,700	2,400	420,900	0	479,300	329	12,300
1921									
Jan.	67,600	87,600	0	0	0	0	0	...	0
Feb.	77,800	155,200	47,000	0	47,000	0	0	317	17,100
Mar.	162,000	186,000	119,000	0	119,000	0	0	340	42,900
April	189,000	229,000	261,000	700	261,000	0	0	322	90,700
May	323,000	156,300	261,000	800	261,000	0	0	324	88,400
June	407,000	217,500	261,000	1,200	261,000	0	0	379	110,100
July	155,000	362,300	261,000	1,400	261,000	0	0	390	109,900
Aug.	51,600	254,900	261,000	1,400	151,500	0	0	327	52,000
Sept.	34,700	44,100	78,700	100	0	0	157,300	...	0
Oct.	26,300	0	26,300	0	0	0	66,700	...	0
Nov.	23,000	0	0	0	0	0	0	...	0
Dec.	63,300	23,000	0	0	0	0	0	...	0
Total or average	1,580,300		1,576,000	5,600	1,361,500	0	224,000	344	42,700
1922									
Jan.	67,600	86,300	0	0	0	0	0	...	0
Feb.	96,100	153,900	47,000	0	47,000	0	0	321	17,400
Mar.	103,000	203,000	119,000	0	119,000	0	0	328	41,000
April	193,000	187,000	261,000	700	130,500	0	0	308	42,800
May	621,000	118,300	261,000	700	244,200	0	0	367	96,200
June	732,000	477,600	261,000	1,900	261,000	0	0	512	148,300
July	270,000	946,700	261,000	3,600	261,000	0	0	565	154,600
Aug.	84,800	952,100	261,000	3,600	261,000	0	0	542	150,000
Sept.	43,400	772,300	236,000	2,200	236,000	0	0	498	131,000
Oct.	31,900	577,500	93,000	1,400	93,000	0	0	466	46,900
Nov.	42,400	515,000	0	900	0	0	0	...	0
Dec.	91,600	556,500	0	0	0	0	0	...	0
Total or average	2,376,800		1,800,000	15,000	1,652,700	0	0	443	69,300
1923									
Jan.	69,500	648,100	0	0	0	0	0	...	0
Feb.	70,000	717,600	47,000	0	47,000	0	0	520	29,000
Mar.	95,900	740,600	119,000	0	119,000	0	0	513	65,600
April	199,000	717,500	261,000	1,600	261,000	0	0	500	145,400
May	450,000	653,900	261,000	2,000	261,000	0	0	513	143,800
June	287,000	840,900	261,000	2,800	261,000	0	0	538	154,200
July	201,000	864,100	261,000	3,300	261,000	0	0	539	149,500
Aug.	72,600	800,800	261,000	2,900	261,000	0	0	507	142,300
Sept.	50,900	609,500	236,000	1,900	236,000	0	0	453	119,900
Oct.	48,300	422,500	93,000	1,200	93,000	0	0	420	42,200
Nov.	33,000	376,600	0	700	0	0	0	...	0
Dec.	27,700	408,900	0	0	0	0	0	...	0
Total or average	1,604,900		1,800,000	16,400	1,800,000	0	0	500	82,900

RESERVOIR ON SAN JOAQUIN RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9, page 134.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.
Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1920
48,700	0	0	0	0	0	0	...	0	Jan.
75,600	47,000	0	0	0	0	0	...	0	Feb.
57,500	119,000	0	0	0	0	0	...	0	Mar.
39,500	198,000	0	0	0	0	63,000	...	0	April
2,500	259,600	0	8,400	0	0	1,400	298	2,600	May
149,900	261,000	900	261,000	0	0	0	336	95,700	June
215,000	261,000	1,400	151,500	0	0	0	320	50,500	July
63,600	108,900	100	0	0	0	152,100	...	0	Aug.
0	29,200	0	0	0	0	206,800	...	0	Sept.
0	37,000	0	0	0	0	56,000	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
44,600	0	0	0	0	0	0	...	0	Dec.
	1,320,700	2,400	420,900	0	0	479,300	329	12,300	Total or average
									1921
87,600	0	0	0	0	0	0	...	0	Jan.
155,200	47,000	0	47,000	0	0	0	317	17,100	Feb.
186,000	119,000	0	119,000	0	0	0	340	42,900	Mar
229,000	261,000	700	261,000	0	0	0	322	90,700	April
156,300	261,000	800	261,000	0	0	0	324	88,400	May
217,500	261,000	1,200	261,000	0	0	0	379	110,100	June
362,300	261,000	1,400	261,000	0	0	0	390	109,900	July
254,900	261,000	1,400	151,500	0	0	0	327	52,000	Aug.
44,100	78,700	100	0	0	0	157,300	...	0	Sept
0	26,300	0	0	0	0	66,700	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
23,000	0	0	0	0	0	0	...	0	Dec.
	1,576,000	5,600	1,361,500	0	0	224,000	344	42,700	Total or average
									1922
86,300	0	0	0	0	0	0	...	0	Jan.
153,900	47,000	0	47,000	0	0	0	321	17,400	Feb.
203,000	119,000	0	119,000	0	0	0	328	41,000	Mar
187,000	261,000	700	130,500	0	0	0	308	42,800	April
118,300	261,000	700	244,200	0	0	0	367	96,200	May
477,600	261,000	1,900	261,000	0	0	0	512	148,300	June
946,700	261,000	3,600	261,000	0	0	0	565	154,600	July
952,100	261,000	3,600	261,000	0	0	0	542	150,000	Aug.
772,300	236,000	2,200	236,000	0	0	0	498	131,000	Sept.
577,500	93,000	1,400	93,000	0	0	0	466	46,900	Oct.
515,000	0	900	0	0	0	0	...	0	Nov.
556,500	0	0	0	0	0	0	...	0	Dec.
	1,800,000	15,000	1,652,700	0	0	0	443	69,300	Total or average
									1923
648,100	0	0	0	0	0	0	...	0	Jan.
717,600	47,000	0	47,000	0	0	0	520	29,000	Feb.
740,600	119,000	0	119,000	0	0	0	513	65,600	Mar.
717,500	261,000	1,600	261,000	0	0	0	500	145,400	April
653,900	261,000	2,000	261,000	0	0	0	513	143,800	May
840,900	261,000	2,800	261,000	0	0	0	538	154,200	June
864,100	261,000	3,300	261,000	0	0	0	539	149,500	July
800,800	261,000	2,900	261,000	0	0	0	507	142,300	Aug.
609,500	236,000	1,900	236,000	0	0	0	453	119,900	Sept.
422,500	93,000	1,200	93,000	0	0	0	420	42,200	Oct.
376,600	0	700	0	0	0	0	...	0	Nov.
408,900	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,400	1,800,000	0	0	0	500	82,900	Total or average

TABLE 9a (Concluded). TEMPERANCE FLAT

WATER AND POWER YIELD BOTH WITH AND WITHOUT

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Without flood control							
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1924									
Jan.	26,900	436,600	0	0	0	0	0	...	0
Feb.	22,600	463,500	47,000	0	47,000	0	0	445	24,100
Mar.	25,800	439,100	119,000	0	119,000	0	0	419	54,000
April	83,300	345,900	261,000	1,000	261,000	0	0	356	102,600
May	152,000	167,200	261,000	800	109,400	0	0	304	34,100
June	37,800	57,400	95,100	100	0	0	165,900	...	0
July	20,600	0	20,600	0	0	0	240,400	...	0
Aug.	16,200	0	16,200	0	0	0	244,800	...	0
Sept.	12,700	0	12,700	0	0	0	223,300	...	0
Oct.	17,700	0	11,700	0	0	0	81,300	...	0
Nov.	27,800	0	0	0	0	0	0	...	0
Dec.	28,700	27,800	0	0	0	0	0	...	0
Total or average	466,100		844,300	1,900	536,400	0	955,700	394	17,800
1925									
Jan.	27,100	56,500	0	0	0	0	0	...	0
Feb.	77,800	83,600	47,000	0	0	0	0	...	0
Mar.	94,700	114,400	119,000	0	0	0	0	...	0
April	196,000	90,100	261,000	400	0	0	0	...	0
May	364,000	24,700	261,000	200	0	0	0	...	0
June	281,000	127,500	261,000	800	60,900	0	0	298	19,000
July	151,000	146,700	261,000	1,100	50,500	0	0	298	15,300
Aug.	65,800	35,600	101,300	100	0	0	159,700	...	0
Sept.	37,100	0	37,100	0	0	0	198,900	...	0
Oct.	39,200	0	39,200	0	0	0	53,800	...	0
Nov.	38,900	0	0	0	0	0	0	...	0
Dec.	40,800	38,900	0	0	0	0	0	...	0
Total or average	1,413,400		1,387,600	2,600	111,400	0	412,400	298	2,900
Total for 18-year period, 1908-1926	32,675,600		28,984,500	225,000	25,008,000	3,970,400	3,415,500	...	
Average for 18-year period, 1908-1926	1,815,300		1,610,300	12,500	1,389,300	220,600	189,700	490	62,000

RESERVOIR ON SAN JOAQUIN RIVER.

FLOOD CONTROL BY RESERVOIR OPERATING DIAGRAM.

Carried out on a Daily Basis.

mary, see Table 9, page 134.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Coordinated with flood control by reservoir operating diagram

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.
Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)	Year and month
									1924
436,600	0	0	0	0	0	0	...	0	Jan.
463,500	47,000	0	47,000	0	0	0	445	24,100	Feb
439,100	119,000	0	119,000	0	0	0	419	54,000	Mar
345,900	261,000	1,000	261,000	0	0	0	356	102,600	April
167,200	261,000	800	109,400	0	0	0	304	34,100	May
57,400	95,100	100	0	0	0	165,900	...	0	June
0	20,600	0	0	0	0	240,400	...	0	July
0	16,200	0	0	0	0	244,800	...	0	Aug.
0	12,700	0	0	0	0	233,300	...	0	Sept.
0	11,700	0	0	0	0	81,300	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
27,800	0	0	0	0	0	0	...	0	Dec.
	844,300	1,900	536,400	0	0	955,700	394	17,800	Total or average
									1925
56,500	0	0	0	0	0	0	...	0	Jan.
83,600	47,000	0	0	0	0	0	...	0	Feb
114,400	119,000	0	0	0	0	0	...	0	Mar.
90,100	261,000	400	0	0	0	0	...	0	April
24,700	261,000	200	0	0	0	0	...	0	May
127,500	261,000	800	60,900	0	0	0	298	19,000	June
146,700	261,000	1,100	50,500	0	0	0	298	15,300	July
35,600	101,300	100	0	0	0	159,700	...	0	Aug.
0	37,100	0	0	0	0	198,900	...	0	Sept.
0	39,200	0	0	0	0	53,800	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
38,900	0	0	0	0	0	0	...	0	Dec.
	1,387,600	2,600	111,400	0	0	412,400	298	2,900	Total or average
	28,984,500	**219,800**	**25,010,400**	**3,530,700**	**442,500**	**3,415,500**	...		**Total for 18-year period, 1908-1926**
	1,610,300	**12,200**	**1,389,500**	**196,100**	**24,600**	**189,700**	**434**	**61,400**	**Average for 18-year period, 1908-1926**

TABLE 10a TEMPERANCE FLAT RESER

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1908										
Jan.	53,100	797,100	0	0	0	0	0	0	...	0
Feb.	58,100	850,200	47,000	0	47,000	0	0	0	548	29,200
Mar.	120,000	861,300	119,000	0	119,000	0	0	0	543	68,400
April	199,000	862,300	261,000	1,700	261,000	0	0	0	530	152,400
May	219,000	798,600	261,000	2,200	261,000	0	0	0	522	145,800
June	176,000	754,400	261,000	2,600	261,000	0	0	0	507	146,900
July	119,000	666,800	261,000	2,800	261,000	0	0	0	478	135,100
Aug.	73,200	522,000	261,000	2,300	261,000	0	0	0	429	121,100
Sept.	39,000	331,900	236,000	1,300	228,100	0	0	0	347	86,800
Oct.	23,900	133,600	93,000	600	0	0	0	0	...	0
Nov.	16,200	63,900	0	200	0	0	0	0	...	0
Dec.	18,500	79,900	0	0	0	0	0	0	...	0
Total or average	1,115,000		1,800,000	13,700	1,699,100	0	0	0	488	73,800
1909										
Jan.	277,000	98,400	0	0	0	0	0	0	...	0
Feb.	183,000	375,400	47,000	0	47,000	0	0	0	438	24,700
Mar.	133,000	511,400	119,000	0	119,000	0	0	0	460	59,300
April	352,000	525,400	261,000	1,300	261,000	0	0	0	459	134,200
May	646,000	615,100	261,000	1,900	266,400	86,700	0	0	529	150,300
June	827,000	906,100	261,000	2,900	273,000	484,800	0	0	553	164,400
July	309,000	972,400	261,000	3,600	263,900	34,400	0	0	568	156,600
Aug.	78,100	979,500	261,000	3,400	261,000	0	0	0	543	150,300
Sept.	37,000	793,200	236,000	2,300	236,000	0	0	0	500	131,400
Oct.	25,000	591,900	93,000	1,500	93,000	0	0	0	468	47,200
Nov.	49,600	522,400	0	900	0	0	0	0	...	0
Dec.	220,000	571,100	0	0	0	0	0	0	...	0
Total or average	3,136,700		1,800,000	17,800	1,820,300	605,900	0	0	503	85,100
1910										
Jan.	188,000	791,100	0	0	0	0	0	0	...	0
Feb.	86,600	979,100	47,000	0	87,600	900	0	0	567	57,600
Mar.	188,000	977,200	119,000	0	123,200	0	0	0	574	73,800
April	375,000	1,042,000	261,000	1,900	262,200	33,800	66,500	0	576	162,600
May	475,000	1,052,600	261,000	2,700	280,900	328,800	0	0	556	164,400
June	237,000	915,200	261,000	2,900	263,300	37,800	0	0	547	157,400
July	99,600	848,200	261,000	3,300	261,000	0	0	0	520	145,200
Aug.	39,600	683,500	261,000	2,700	261,000	0	0	0	469	132,700
Sept.	51,700	459,400	236,000	1,600	236,000	0	0	0	398	104,900
Oct.	29,600	273,500	93,000	900	93,000	0	0	0	357	35,500
Nov.	24,000	209,200	0	500	0	0	0	0	...	0
Dec.	31,400	232,700	0	0	0	0	0	0	...	0
Total or average	1,825,500		1,800,000	16,500	1,868,200	401,300	66,500	0	506	86,200
1911										
Jan.	239,000	264,100	0	0	0	0	0	0	...	0
Feb.	207,000	503,100	47,000	0	47,000	0	0	0	489	27,500
Mar.	336,000	663,100	119,000	0	119,000	0	0	0	525	66,700
April	425,000	880,100	261,000	1,800	261,000	0	0	0	561	158,900
May	571,000	1,042,300	261,000	2,600	280,000	430,500	0	0	557	164,000
June	946,000	900,200	261,000	2,900	272,300	541,900	0	0	555	164,400
July	593,000	1,029,100	261,000	3,700	273,100	203,700	74,600	0	574	163,300
Aug.	116,000	1,067,000	261,000	3,500	261,000	0	0	0	569	155,200
Sept.	45,500	918,500	236,000	2,400	236,000	0	0	0	532	138,200
Oct.	32,300	725,600	93,000	1,600	93,000	0	0	0	507	50,700
Nov.	28,000	663,300	0	1,000	0	0	0	0	...	0
Dec.	23,400	690,300	0	0	0	0	0	0	...	0
Total or average	3,562,200		1,800,000	19,500	1,842,400	1,176,100	74,600	0	542	91,000

VOIR ON SAN JOAQUIN RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 10, page 136.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 400,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1908
797,100	0	0	0	0	0	0	...	0	Jan.
850,200	47,000	0	47,000	0	0	0	548	29,200	Feb.
861,300	119,000	0	119,000	0	0	0	543	68,400	Mar.
862,300	261,000	1,700	261,000	0	0	0	530	152,400	April
798,600	261,000	2,200	261,000	0	0	0	522	145,800	May
754,400	261,000	2,600	261,000	0	0	0	507	146,900	June
666,800	261,000	2,800	261,000	0	0	0	478	135,100	July
522,000	261,000	2,300	261,000	0	0	0	429	121,100	Aug.
331,900	236,000	1,300	228,100	0	0	0	347	86,800	Sept.
133,600	93,000	600	0	0	0	0	...	0	Oct.
63,900	0	200	0	0	0	0	...	0	Nov.
79,900	0	0	0	0	0	0	...	0	Dec.
	1,800,000	13,700	1,699,100	0	0	0	488	73,800	Total or average
									1909
98,400	0	0	0	0	0	0	...	0	Jan.
375,400	47,000	0	47,000	0	0	0	438	24,700	Feb.
511,400	119,000	0	119,000	0	0	0	460	59,300	Mar.
525,400	261,000	1,300	261,000	0	0	0	459	134,200	April
615,100	261,000	1,900	269,000	96,200	0	0	527	151,500	May
894,000	261,000	2,900	274,800	549,300	0	0	548	164,400	June
894,000	261,000	3,400	272,200	79,000	0	0	544	156,900	July
848,400	261,000	3,100	261,000	0	0	0	516	144,400	Aug.
662,400	236,000	2,000	236,000	0	0	0	466	123,300	Sept.
461,400	93,000	1,200	93,000	0	0	0	430	43,300	Oct.
392,200	0	700	0	0	0	0	...	0	Nov.
441,100	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,500	1,833,000	624,500	0	0	488	83,700	Total or average
									1910
661,100	0	0	0	0	0	0	...	0	Jan.
849,100	47,000	0	47,000	0	0	0	552	30,400	Feb.
888,700	119,000	0	138,700	0	0	0	555	81,200	Mar.
938,000	261,000	1,800	262,400	76,500	0	0	558	159,000	April
972,300	261,000	2,500	285,500	265,300	0	0	544	164,400	May
894,000	261,000	2,900	263,600	35,700	0	0	542	156,700	June
828,800	261,000	3,300	261,000	0	0	0	514	144,000	July
664,100	261,000	2,600	261,000	0	0	0	463	131,000	Aug.
440,100	236,000	1,600	236,000	0	0	0	396	104,200	Sept.
254,200	93,000	800	93,000	0	0	0	344	34,000	Oct.
190,000	0	500	0	0	0	0	...	0	Nov.
213,500	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,000	1,848,200	377,500	0	0	496	83,900	Total or average
									1911
244,900	0	0	0	0	0	0	...	0	Jan.
483,900	47,000	0	47,000	0	0	0	484	27,200	Feb.
643,900	119,000	0	119,000	0	0	0	520	66,300	Mar.
860,900	261,000	1,700	262,400	76,500	0	0	555	158,500	April
945,300	261,000	2,500	286,000	333,800	0	0	543	164,400	May
894,000	261,000	2,900	272,700	540,100	0	0	554	164,400	June
1,024,300	261,000	3,700	270,000	287,200	0	0	568	160,400	July
1,056,400	261,000	3,500	261,000	0	0	0	566	154,800	Aug.
907,900	236,000	2,400	236,000	0	0	0	529	137,500	Sept.
715,000	93,000	1,600	93,000	0	0	0	504	50,400	Oct.
652,700	0	1,000	0	0	0	0	...	0	Nov.
679,700	0	0	0	0	0	0	...	0	Dec.
	1,800,000	19,300	1,847,100	1,237,600	0	0	536	90,600	Total or average

TABLE 10a (Continued). TEMPERANCE FLAT

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)
1912										
Jan.	30,100	713,700	0	0	0	0	0	0	...	0
Feb.	26,600	743,800	47,000	0	47,000	0	0	0	521	28,000
Mar.	55,200	723,400	119,000	0	119,000	0	0	0	505	64,700
April	75,000	659,600	261,000	1,500	261,000	0	0	0	468	136,700
May	255,000	472,100	261,000	1,600	261,000	0	0	0	431	121,800
June	368,000	464,500	261,000	1,900	261,000	0	0	0	472	137,900
July	95,300	569,600	261,000	2,600	261,000	0	0	0	445	125,800
Aug.	38,000	401,300	261,000	1,900	261,000	0	0	0	367	102,700
Sept.	22,400	176,400	198,100	700	39,300	0	0	37,900	305	12,800
Oct.	17,800	0	17,800	0	0	0	0	75,200	...	0
Nov.	20,300	0	0	0	0	0	0	0	...	0
Dec.	20,000	20,300	0	0	0	0	0	0	...	0
Total or average	1,023,700		1,686,900	10,200	1,510,300	0	0	113,100	454	60,900
1913										
Jan.	22,100	40,300	0	0	0	0	0	0	...	0
Feb.	25,700	62,400	47,000	0	0	0	0	0	...	0
Mar.	38,200	41,100	79,300	0	0	0	0	39,700	...	0
April	95,800	0	95,800	0	0	0	0	165,200	...	0
May	247,000	0	219,200	0	0	0	0	41,800	...	0
June	170,000	27,800	197,700	100	0	0	0	63,300	...	0
July	102,000	0	102,000	0	0	0	0	159,000	...	0
Aug.	68,900	0	68,900	0	0	0	0	192,100	...	0
Sept.	40,600	0	40,600	0	0	0	0	195,400	...	0
Oct.	12,800	0	12,800	0	0	0	0	802,000	...	0
Nov.	22,300	0	0	0	0	0	0	0	...	0
Dec.	28,700	22,300	0	0	0	0	0	0	...	0
Total or average	874,100		863,300	100	0	0	0	936,700	0	0
1914										
Jan.	259,000	51,000	0	0	0	0	0	0	...	0
Feb.	145,000	310,000	47,000	0	47,000	0	0	0	404	22,800
Mar.	234,000	408,000	119,000	0	119,000	0	0	0	439	56,600
April	395,000	523,000	261,000	1,300	261,000	0	0	0	475	138,800
May	577,000	655,700	261,000	2,000	264,300	66,800	0	0	519	146,800
June	607,000	899,600	261,000	2,900	275,100	264,900	0	0	547	164,400
July	392,000	963,700	261,000	3,600	265,000	26,200	0	0	574	158,600
Aug.	142,000	1,060,900	261,000	3,500	261,000	0	0	0	573	156,100
Sept.	53,900	938,400	236,000	2,500	236,000	0	0	0	537	139,000
Oct.	40,300	753,800	93,000	1,700	93,000	0	0	0	513	51,200
Nov.	30,500	699,400	0	1,100	0	0	0	0	...	0
Dec.	29,600	728,800	0	0	0	0	0	0	...	0
Total or average	2,905,300		1,800,000	18,600	1,821,400	357,900	0	0	510	86,400
1915										
Jan.	38,200	758,400	0	0	0	0	0	0	...	0
Feb.	90,000	796,600	47,000	0	47,000	0	0	0	537	29,600
Mar.	124,000	839,600	119,000	0	119,000	0	0	0	537	67,900
April	246,000	844,600	261,000	1,700	261,000	0	0	0	532	152,800
May	381,000	827,900	261,000	2,300	264,100	44,300	0	0	538	151,100
June	586,000	898,200	261,000	2,900	275,200	241,300	0	0	547	164,400
July	287,000	964,800	261,000	3,600	263,300	2,100	0	0	568	156,500
Aug.	70,100	982,800	261,000	3,400	261,000	0	0	0	545	150,700
Sept.	44,300	788,500	236,000	2,300	236,000	0	0	0	500	131,400
Oct.	26,700	594,500	93,000	1,500	93,000	0	0	0	466	47,000
Nov.	23,400	526,700	0	900	0	0	0	0	...	0
Dec.	37,900	549,200	0	0	0	0	0	0	...	0
Total or average	1,954,600		1,800,000	18,600	1,819,600	287,700	0	0	530	87,800

RESERVOIR ON SAN JOAQUIN RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 10, page 136.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (rain-water floods, 133,000 ac. ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1912
703,100	0	0	0	0	0	0	...	0	Jan.
733,200	47,000	0	47,000	0	0	0	518	27,900	Feb.
712,800	119,000	0	119,000	0	0	0	502	64,400	Mar.
649,000	261,000	1,500	261,000	0	0	0	464	135,600	April
461,500	261,000	1,600	261,000	0	0	0	427	120,600	May
453,900	261,000	1,900	261,000	0	0	0	468	136,800	June
559,000	261,000	2,500	261,000	0	0	0	441	124,700	July
390,800	261,000	1,900	261,000	0	0	0	361	101,100	Aug.
165,900	187,700	600	23,600	0	0	48,300	302	7,500	Sept.
0	17,800	0	0	0	0	75,200	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
20,300	0	0	0	0	0	0	...	0	Dec.
	1,676,500	10,000	1,494,600	0	0	123,500	454	59,900	Total or average
									1913
40,300	0	0	0	0	0	0	...	0	Jan.
62,400	47,000	0	0	0	0	0	...	0	Feb.
41,100	79,300	0	0	0	0	39,700	...	0	Mar.
0	95,800	0	0	0	0	165,200	...	0	April
0	219,200	0	0	0	0	41,800	...	0	May
27,800	197,700	100	0	0	0	63,300	...	0	June
0	102,000	0	0	0	0	159,000	...	0	July
0	68,900	0	0	0	0	192,100	...	0	Aug.
0	40,600	0	0	0	0	195,400	...	0	Sept.
0	12,800	0	0	0	0	80,200	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
22,300	0	0	0	0	0	0	...	0	Dec.
	863,300	100	0	0	0	936,700	0	0	Total or average
									1914
51,000	0	0	0	0	0	0	...	0	Jan.
310,000	47,000	0	47,000	0	0	0	404	22,800	Feb.
408,000	119,000	0	119,000	0	0	0	439	56,600	Mar.
523,000	261,000	1,300	261,000	0	0	0	475	138,800	April
655,700	261,000	2,000	265,100	71,600	0	0	519	147,200	May
894,000	261,000	2,900	277,100	327,000	0	0	542	164,400	June
894,000	261,000	3,400	272,900	98,800	0	0	547	157,900	July
910,900	261,000	3,200	261,000	0	0	0	541	149,700	Aug.
788,700	236,000	2,300	236,000	0	0	0	502	131,900	Sept.
604,300	93,000	1,500	93,000	0	0	0	474	47,800	Oct.
550,100	0	900	0	0	0	0	...	0	Nov.
579,700	0	0	0	0	0	0	...	0	Dec.
	1,800,000	17,500	1,832,100	497,400	0	0	495	85,000	Total or average
									1915
609,300	0	0	0	0	0	0	...	0	Jan.
647,500	47,000	0	47,000	0	0	0	502	28,100	Feb.
690,500	119,000	0	119,000	0	0	0	503	64,400	Mar
695,500	261,000	1,500	261,000	0	0	0	497	144,600	April
679,000	261,000	2,000	261,000	0	0	0	506	142,100	May
797,000	261,000	2,700	273,200	213,100	0	0	541	161,900	June
894,000	261,000	3,400	271,800	45,300	0	0	545	156,900	July
860,500	261,000	3,100	261,000	0	0	0	529	147,200	Aug.
666,500	236,000	2,000	236,000	0	0	0	468	123,800	Sept.
472,800	93,000	1,200	93,000	0	0	0	433	43,500	Oct.
405,300	0	800	0	0	0	0	...	0	Nov.
427,900	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,700	1,823,000	258,400	0	0	503	84,600	Total or average

TABLE 10a (Continued). TEMPERANCE FLAT

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1916										
Jan.	173,000	587,100	0	0	0	0	0	0	...	0
Feb.	142,000	760,100	47,000	0	47,000	0	0	0	532	28,400
Mar.	338,000	855,100	119,000	0	122,100	0	0	0	562	72,000
April	477,000	1,071,000	261,000	2,000	264,300	0	210,700	0	579	164,400
May	552,000	1,071,000	261,000	2,700	280,100	417,600	21,500	0	558	164,400
June	572,000	901,100	261,000	2,900	274,000	226,600	0	0	549	164,300
July	289,000	969,600	261,000	3,600	261,000	0	0	0	569	155,400
Aug.	91,000	994,000	261,000	3,400	261,000	0	0	0	551	151,700
Sept.	44,900	820,600	236,000	2,300	236,000	0	0	0	509	133,300
Oct.	63,900	627,200	93,000	1,500	93,000	0	0	0	486	48,900
Nov.	38,900	596,600	0	1,000	0	0	0	0	...	0
Dec.	45,300	634,500	0	0	0	0	0	0	...	0
Total or average	2,827,000		1,800,000	19,400	1,838,500	644,200	232,200	0	544	90,300
1917										
Jan.	47,500	679,800	0	0	0	0	0	0	...	0
Feb.	129,000	727,300	47,000	0	47,000	0	0	0	519	28,900
Mar.	108,000	809,300	119,000	0	119,000	0	0	0	531	67,300
April	226,000	798,300	261,000	1,700	261,000	0	0	0	518	149,700
May	373,000	761,600	261,000	2,200	261,000	0	0	0	530	147,400
June	579,000	871,400	261,000	2,800	262,900	57,600	56,100	0	569	161,400
July	222,000	1,071,000	261,000	3,800	264,200	0	13,100	0	579	159,100
Aug.	72,600	1,011,900	261,000	3,400	261,000	0	0	0	553	152,200
Sept.	36,100	820,100	236,000	2,300	236,000	0	0	0	507	133,200
Oct.	25,400	617,900	93,000	1,500	93,000	0	0	0	477	48,000
Nov.	21,900	548,800	0	900	0	0	0	0	...	0
Dec.	19,600	569,800	0	0	0	0	0	0	...	0
Total or average	1,860,100		1,800,000	18,600	1,805,100	57,600	69,200	0	532	87,500
1918										
Jan.	20,500	589,400	0	0	0	0	0	0	...	0
Feb.	36,800	609,900	47,000	0	47,000	0	0	0	484	27,200
Mar.	149,000	599,700	119,000	0	119,000	0	0	0	483	62,200
April	179,000	629,700	261,000	1,400	261,000	0	0	0	477	139,300
May	307,000	546,300	261,000	1,800	261,000	0	0	0	470	132,900
June	494,000	590,500	261,000	2,200	261,000	0	0	0	510	147,800
July	121,000	821,300	261,000	3,400	261,000	0	0	0	517	144,600
Aug.	42,800	677,900	261,000	2,700	261,000	0	0	0	467	132,100
Sept.	48,700	457,000	236,000	1,600	236,000	0	0	0	403	106,100
Oct.	103,000	268,100	93,000	900	93,000	0	0	0	382	38,300
Nov.	44,000	277,200	0	600	0	0	0	0	...	0
Dec.	50,700	320,600	0	0	0	0	0	0	...	0
Total or average	1,596,500		1,800,000	14,600	1,800,000	0	0	0	466	77,700
1919										
Jan.	38,400	371,300	0	0	0	0	0	0	...	0
Feb.	68,900	409,700	47,000	0	47,000	0	0	0	430	24,300
Mar.	94,100	431,600	119,000	0	119,000	0	0	0	427	55,000
April	209,000	406,700	261,000	1,100	261,000	0	0	0	407	118,600
May	441,000	353,600	261,000	1,300	261,000	0	0	0	430	121,500
June	154,000	532,300	261,000	2,100	261,000	0	0	0	447	130,600
July	61,500	423,200	261,000	2,100	261,000	0	0	0	389	109,500
Aug.	30,400	221,600	250,300	1,700	92,600	0	0	10,700	320	30,800
Sept.	23,000	0	23,000	0	0	0	0	213,000	...	0
Oct.	22,400	0	22,400	0	0	0	0	70,600	...	0
Nov.	18,600	0	0	0	0	0	0	0	...	0
Dec.	30,100	18,600	0	0	0	0	0	0	...	0
Total or average	1,191,400		1,505,700	8,300	1,302,600	0	0	294,300	416	49,200

RESERVOIR ON SAN JOAQUIN RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 10, page 136.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1916
465,800	0	0	0	0	0	0	...	0	Jan.
638,800	47,000	0	47,000	0	0	0	504	27,300	Feb.
733,800	119,000	0	129,400	4,400	0	0	536	73,800	Mar.
938,000	261,000	1,800	264,100	108,700	4,200	0	566	161,900	April
1,036,200	261,000	2,600	282,900	408,700	0	0	551	164,400	May
894,000	261,000	2,900	276,900	292,200	0	0	542	164,400	June
894,000	261,000	3,400	272,600	38,100	0	0	546	157,400	July
868,900	261,000	3,100	261,000	0	0	0	524	146,100	Aug.
695,800	236,000	2,100	236,000	0	0	0	476	125,800	Sept.
502,600	93,000	1,300	93,000	0	0	0	451	45,400	Oct.
472,200	0	800	0	0	0	0	...	0	Nov.
510,300	0	0	0	0	0	0	...	0	Dec.
	1,800,00	18,000	1,862,900	852,100	4,200	0	522	89,000	Total or average
									1917
555,600	0	0	0	0	0	0	...	0	Jan.
603,100	47,000	0	47,000	0	0	0	489	27,500	Feb.
685,100	119,000	0	119,000	0	0	0	502	64,400	Mar.
674,100	261,000	1,500	261,000	0	0	0	488	142,400	April
637,600	261,000	2,000	261,000	0	0	0	501	140,900	May
747,600	261,000	2,600	270,500	159,500	0	0	537	159,400	June
894,000	261,000	3,400	267,400	10,000	0	0	544	154,000	July
835,200	261,000	3,100	261,000	0	0	0	536	148,900	Aug.
643,700	236,000	2,000	236,000	0	0	0	461	121,800	Sept.
441,800	93,000	1,200	93,000	0	0	0	422	42,500	Oct.
373,000	0	700	0	0	0	0	...	0	Nov.
394,200	0	0	0	0	0	0	...	0	Dec.
	1,800,000	16,500	1,815,900	169,500	0	0	498	83,700	Total or average
									1918
413,800	0	0	0	0	0	0	...	0	Jan.
434,300	47,000	0	47,000	0	0	0	432	24,400	Feb.
424,100	119,000	0	119,000	0	0	0	431	55,500	Mar.
454,100	261,000	1,200	261,000	0	0	0	422	122,900	April
370,900	261,000	1,400	261,000	0	0	0	415	117,100	May
415,500	261,000	1,800	261,000	0	0	0	464	135,600	June
646,700	261,000	2,800	261,000	0	0	0	473	133,600	July
503,900	261,000	2,200	261,000	0	0	0	411	116,000	Aug.
283,500	236,000	1,200	173,100	0	0	0	334	63,100	Sept.
95,000	93,000	400	18,000	0	0	0	296	5,400	Oct.
104,600	0	300	0	0	0	0	...	0	Nov.
148,300	0	0	0	0	0	0	...	0	Dec.
	1,800,000	11,300	1,662,100	0	0	0	423	64,600	Total or average
									1919
199,000	0	0	0	0	0	0	...	0	Jan.
237,400	47,000	0	47,000	0	0	0	360	20,100	Feb.
259,300	119,000	0	119,000	0	0	0	357	45,400	Mar.
234,400	261,000	800	261,000	0	0	0	333	94,600	April
181,600	261,000	900	261,000	0	0	0	363	101,600	May
360,700	261,000	1,600	261,000	0	0	0	386	112,400	June
252,100	261,000	1,500	151,500	0	0	0	328	52,200	July
51,100	81,400	100	0	0	0	179,600	...	0	Aug.
0	23,000	0	0	0	0	213,000	...	0	Sept.
0	22,400	0	0	0	0	70,600	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
18,600	0	0	0	0	0	0	...	0	Dec.
	1,336,800	4,900	1,100,500	0	0	463,200	357	35,500	Total or average

TABLE 10a (Continued). TEMPERANCE FLAT

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor=1.00)
1920										
Jan.	26,900	48,700	0	0	0	0	0	0	...	0
Feb.	28,900	75,600	47,000	0	0	0	0	0	...	0
Mar.	101,000	57,500	119,000	0	0	0	0	0	...	0
April	161,000	39,500	198,000	0	0	0	0	63,000	...	0
May	407,000	2,500	259,600	0	8,400	0	0	1,400	298	2,600
June	327,000	149,900	261,000	900	261,000	0	0	0	336	95,700
July	111,000	215,000	261,000	1,400	151,500	0	0	0	320	50,500
Aug.	45,400	63,600	108,900	100	0	0	0	152,100	...	0
Sept.	29,200	0	29,200	0	0	0	0	206,800	...	0
Oct.	37,000	0	37,000	0	0	0	0	56,000	...	0
Nov.	44,600	0	0	0	0	0	0	0	...	0
Dec.	43,000	44,600	0	0	0	0	0	0	...	0
Total or average	1,362,000		1,320,700	2,400	420,900	0	0	479,300	329	12,300
1921										
Jan.	67,600	87,600	0	0	0	0	0	0	...	0
Feb.	77,800	155,200	47,000	0	47,000	0	0	0	317	17,100
Mar.	162,000	186,000	119,000	0	119,000	0	0	0	340	42,900
April	189,000	229,000	261,000	700	261,000	0	0	0	322	90,700
May	323,000	156,300	261,000	800	261,000	0	0	0	324	88,400
June	407,000	217,500	261,000	1,200	261,000	0	0	0	379	110,100
July	155,000	362,300	261,000	1,400	261,000	0	0	0	390	109,900
Aug.	51,600	254,900	261,000	1,400	151,500	0	0	0	327	52,000
Sept.	34,700	44,100	78,700	100	0	0	0	157,300	...	0
Oct.	26,300	0	26,300	0	0	0	0	66,700	...	0
Nov.	23,000	0	0	0	0	0	0	0	...	0
Dec.	63,300	23,000	0	0	0	0	0	0	...	0
Total or average	1,580,300		1,576,000	5,600	1,361,500	0	0	224,000	344	42,700
1922										
Jan.	67,600	86,300	0	0	0	0	0	0	...	0
Feb.	96,100	153,900	47,000	0	47,000	0	0	0	321	17,400
Mar.	103,000	203,000	119,000	0	119,000	0	0	0	328	41,000
April	192,000	187,000	261,000	700	130,500	0	0	0	308	42,800
May	621,000	118,300	261,000	700	244,200	0	0	0	367	96,200
June	732,000	477,600	261,000	1,900	261,000	0	0	0	512	148,300
July	270,000	946,700	261,000	3,600	261,000	0	0	0	565	154,600
Aug.	84,800	952,100	261,000	3,600	261,000	0	0	0	542	150,000
Sept.	43,400	772,300	236,000	2,200	236,000	0	0	0	498	131,000
Oct.	31,900	577,500	93,000	1,400	93,000	0	0	0	466	46,900
Nov.	42,400	515,000	0	900	0	0	0	0	...	0
Dec.	91,600	556,500	0	0	0	0	0	0	...	0
Total or average	2,376,800		1,800,000	15,000	1,652,700	0	0	0	443	69,300
1923										
Jan.	69,500	648,100	0	0	0	0	0	0	...	0
Feb.	70,000	717,600	47,000	0	47,000	0	0	0	520	29,000
Mar.	95,900	740,600	119,000	0	119,000	0	0	0	513	65,600
April	199,000	717,500	261,000	1,600	261,000	0	0	0	500	145,400
May	450,000	653,900	261,000	2,000	261,000	0	0	0	513	143,800
June	287,000	840,900	261,000	2,800	261,000	0	0	0	538	154,200
July	201,000	864,100	261,000	3,300	261,000	0	0	0	539	149,500
Aug.	72,600	800,800	261,000	2,900	261,000	0	0	0	507	142,300
Sept.	50,900	609,500	236,000	1,900	236,000	0	0	0	453	119,900
Oct.	48,300	422,500	93,000	1,200	93,000	0	0	0	420	42,200
Nov.	33,000	376,600	0	700	0	0	0	0	...	0
Dec.	27,700	408,900	0	0	0	0	0	0	...	0
Total or average	1,604,900		1,800,000	16,400	1,800,000	0	0	0	500	82,900

RESERVOIR ON SAN JOAQUIN RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 10, page 136.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evapora-tion in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1920
48,700	0	0	0	0	0	0	...	0	Jan.
75,600	47,000	0	0	0	0	0	...	0	Feb.
57,500	119,000	0	0	0	0	0	...	0	Mar.
39,500	198,000	0	0	0	0	63,000	...	0	April
2,500	259,600	0	8,400	0	0	1,400	298	2,600	May
149,900	261,000	900	261,000	0	0	0	336	95,700	June
215,000	261,000	1,400	151,500	0	0	0	320	50,500	July
63,600	108,900	100	0	0	0	152,100	...	0	Aug.
0	29,200	0	0	0	0	206,800	...	0	Sept.
0	37,000	0	0	0	0	56,000	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
44,600	0	0	0	0	0	0	...	0	Dec.
	1,320,700	2,400	420,900	0	0	479,300	329	12,300	Total or average
									1921
87,600	0	0	0	0	0	0	...	0	Jan.
155,200	47,000	0	47,000	0	0	0	317	17,100	Feb.
186,000	119,000	0	119,000	0	0	0	340	42,900	Mar.
229,000	261,000	700	261,000	0	0	0	322	90,700	April
156,300	261,000	800	261,000	0	0	0	324	88,400	May
217,500	261,000	1,200	261,000	0	0	0	379	110,100	June
362,300	261,000	1,400	261,000	0	0	0	390	109,900	July
254,900	261,000	1,400	151,500	0	0	0	327	52,000	Aug.
44,100	78,700	100	0	0	0	157,300	...	0	Sept.
0	26,300	0	0	0	0	66,700	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
23,000	0	0	0	0	0	0	...	0	Dec.
	1,576,600	5,600	1,361,500	0	0	224,000	344	42,700	Total or average
									1922
86,300	0	0	0	0	0	0	...	0	Jan.
153,900	47,000	0	47,000	0	0	0	321	17,400	Feb.
203,000	119,000	0	119,000	0	0	0	328	41,000	Mar.
187,000	261,000	700	130,500	0	0	0	308	42,800	April
118,300	261,000	700	244,200	0	0	0	367	96,200	May
477,600	261,000	1,900	263,600	50,100	0	0	510	148,900	June
894,000	261,000	3,400	270,600	41,300	0	0	544	156,100	July
848,700	261,000	3,100	261,000	0	0	0	518	144,900	Aug.
669,400	236,000	2,000	236,000	0	0	0	470	124,300	Sept.
474,800	93,000	1,200	93,000	0	0	0	435	43,800	Oct.
412,500	0	800	0	0	0	0	...	0	Nov.
454,100	0	0	0	0	0	0	...	0	Dec.
	1,800,000	13,800	1,664,900	91,400	0	0	431	68,200	Total or average
									1923
545,700	0	0	0	0	0	0	...	0	Jan.
615,200	47,000	0	47,000	0	0	0	494	27,800	Feb.
638,200	119,000	0	119,000	0	0	0	489	62,900	Mar.
615,100	261,000	1,400	261,000	0	0	0	474	138,500	April
551,700	261,000	1,800	261,000	0	0	0	488	137,800	May
738,900	261,000	2,600	261,000	0	0	0	516	149,300	June
762,300	261,000	3,100	261,000	0	0	0	520	145,300	July
699,200	261,000	2,700	261,000	0	0	0	480	135,500	Aug.
508,100	236,000	1,700	236,000	0	0	0	420	110,800	Sept.
321,300	93,000	1,000	93,000	0	0	0	381	38,200	Oct.
275,600	0	600	0	0	0	0	...	0	Nov.
308,000	0	0	0	0	0	0	...	0	Dec.
	1,800,000	14,900	1,800,000	0	0	0	473	79,000	Total or average

TABLE 10a (Concluded). TEMPERANCE FLAT

COMPARISON OF WATER AND POWER YIELD

Monthly Summary of Computations

(For corresponding yearly sum

Seasonal irrigation yield 1,800,000 acre-feet. (Supplemented by ground water
Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Year and month	Run-off at Friant in acre-feet	Flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.								
		Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for down-stream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor = 1.00)
1924										
Jan.	26,900	436,600	0	0	0	0	0	0	...	0
Feb.	22,600	463,500	47,000	0	47,000	0	0	0	445	24,100
Mar.	25,800	439,100	119,000	0	119,000	0	0	0	419	54,000
April	83,300	345,900	261,000	1,000	261,000	0	0	0	356	102,600
May	152,000	167,200	261,000	800	109,400	0	0	0	304	34,100
June	37,800	57,400	95,100	100	0	0	0	165,900	...	0
July	20,600	0	20,600	0	0	0	0	240,400	...	0
Aug.	16,200	0	16,200	0	0	0	0	244,800	...	0
Sept.	12,700	0	12,700	0	0	0	0	223,300	...	0
Oct.	11,700	0	11,700	0	0	0	0	81,300	...	0
Nov.	27,800	0	0	0	0	0	0	0	...	0
Dec.	28,700	27,800	0	0	0	0	0	0	...	0
Total or average	466,100		844,300	1,900	536,400	0	0	955,700	394	17,800
1925										
Jan.	27,100	56,500	0	0	0	0	0	0	...	0
Feb.	77,800	83,600	47,000	0	0	0	0	0	...	0
Mar.	94,700	114,400	119,000	0	0	0	0	0	...	0
April	196,000	90,100	261,000	400	0	0	0	0	...	0
May	364,000	24,700	261,000	200	0	0	0	0	...	0
June	281,000	127,500	261,000	800	60,900	0	0	0	208	19,000
July	151,000	146,700	261,000	1,100	50,500	0	0	0	298	15,300
Aug.	65,800	35,600	101,300	100	0	0	0	159,700	...	0
Sept.	37,100	0	37,100	0	0	0	0	198,900	...	0
Oct.	39,200	0	39,200	0	0	0	0	53,800	...	0
Nov.	38,900	0	0	0	0	0	0	0	...	0
Dec.	40,800	38,900	0	0	0	0	0	0	...	0
Total or average	1,413,400		1,387,600	2,600	111,400	0	0	412,400	298	2,900
Total for 18-year period, 1908-1926	**32,675,600**		**28,984,500**	**219,800**	**25,010,400**	**3,530,700**	**442,500**	**3,415,500**	...	
Average for 18-year period, 1908-1926	**1,815,300**		**1,610,300**	**12,200**	**1,389,500**	**196,100**	**24,600**	**189,700**	**484**	**61,400**

RESERVOIR ON SAN JOAQUIN RIVER.

FOR TWO METHODS OF FLOOD CONTROL.

Carried out on a Daily Basis.

mary, see Table 10, page 136.)

supply in years of deficiency. No deduction for downstream prior rights.)

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Flood control, holding maximum space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season

Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.

Stage of reservoir at beginning of month in acre-feet	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Evaporation in acre-feet	Power draft through turbines in acre-feet	Release through flood control outlets in acre-feet	Waste over spillway in acre-feet	Deficiency in irrigation supply in acre-feet	Average power head through period of operation in feet	Average power yield in kilowatts (Load factor= 1.00)	Year and month
									1924
335,700	0	0	0	0	0	0	...	0	Jan.
362,600	47,000	0	47,000	0	0	0	409	22,300	Feb.
338,200	119,000	0	119,000	0	0	0	380	48,700	Mar.
245,000	261,000	800	147,900	0	0	0	323	51,500	April
66,500	218,200	300	0	0	0	42,800	...	0	May
0	37,800	0	0	0	0	223,200	...	0	June
0	20,600	0	0	0	0	240,400	...	0	July
0	16,200	0	0	0	0	244,800	...	0	Aug.
0	12,700	0	0	0	0	223,300	...	0	Sept.
0	11,700	0	0	0	0	81,300	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov.
27,800	0	0	0	0	0	0	...	0	Dec.
	744,200	1,100	313,900	0	0	1,055,800	378	10,100	Total or average
									1925
56,500	0	0	0	0	0	0	...	0	Jan.
83,600	47,000	0	0	0	0	0	...	0	Feb.
114,400	119,000	0	0	0	0	0	...	0	Mar.
90,100	261,000	400	0	0	0	0	...	0	April
24,700	261,000	200	0	0	0	0	...	0	May
127,500	261,000	800	60,900	0	0	0	298	19,000	June
146,700	261,000	1,100	50,500	0	0	0	298	15,300	July
35,600	101,300	100	0	0	0	159,700	...	0	Aug.
0	37,100	0	0	0	0	198,900	...	0	Sept.
0	39,200	0	0	0	0	53,800	...	0	Oct.
0	0	0	0	0	0	0	...	0	Nov
38,900	0	0	0	0	0	0	...	0	Dec.
	1,387,600	2,600	111,400	0	0	412,400	298	2,900	Total or average
	28,705,100	**200,900**	**24,491,100**	**4,208,400**	**4,200**	**3,694,900**			**Total for 18-year period, 1908-1926**
	1,594,700	**11,200**	**1,360,600**	**233,800**	**200**	**205,300**	**467**	**58,300**	**Average for 18-year period, 1908-1926**

TABLE 11a. TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For corresponding yearly summary, see Table 11, page 138.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.
Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).
Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1908									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,200	47,000	0	29,200	47,000	0	29,200
Mar.	119,000	0	68,400	119,000	0	68,400	119,000	0	68,400
April	261,000	0	152,400	261,000	0	152,400	261,000	0	152,400
May	261,000	0	145,800	261,000	0	145,800	261,000	0	145,800
June	261,000	0	146,900	261,000	0	146,900	261,000	0	146,900
July	261,000	0	135,100	261,000	0	135,100	261,000	0	135,100
Aug.	261,000	0	121,100	261,000	0	121,100	261,000	0	121,100
Sept.	236,000	0	86,800	236,000	0	86,800	236,000	0	86,800
Oct.	93,000	0	0	93,000	0	0	93,000	0	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	73,800	1,800,000	0	73,800	1,800,000	0	73,800
1909									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	24,700	47,000	0	24,700	47,000	0	24,700
Mar.	119,000	0	59,300	119,000	0	59,300	119,000	0	59,300
April	261,000	0	134,200	261,000	0	134,200	261,000	0	134,200
May	261,000	0	147,700	261,000	0	150,300	261,000	0	151,500
June	261,000	0	164,200	261,000	0	164,400	261,000	0	164,400
July	261,000	0	161,000	261,000	0	156,600	261,000	0	156,900
Aug.	261,000	0	152,400	261,000	0	150,300	261,000	0	144,400
Sept.	236,000	0	134,200	236,000	0	131,400	236,000	0	123,300
Oct.	93,000	0	48,500	93,000	0	47,200	93,000	0	43,300
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	85,800	1,800,000	0	85,100	1,800,000	0	83,700
1910									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	31,500	47,000	0	57,600	47,000	0	30,400
Mar.	119,000	0	109,700	119,000	0	73,800	119,000	0	81,200
April	261,000	0	163,500	261,000	0	162,600	261,000	0	159,000
May	261,000	0	164,400	261,000	0	164,400	261,000	0	164,400
June	261,000	0	162,600	261,000	0	157,400	261,000	0	156,700
July	261,000	0	152,300	261,000	0	145,200	261,000	0	144,000
Aug.	261,000	0	142,900	261,000	0	132,700	261,000	0	131,000
Sept.	236,000	0	120,400	236,000	0	104,900	236,000	0	104,200
Oct.	93,000	0	42,200	93,000	0	35,500	93,000	0	34,000
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	91,100	1,800.000	0	86,200	1,800,000	0	83,900

TABLE 11a (Continued). TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For corresponding yearly summary, see Table 11, page 138.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.
Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).
Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1911									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,200	47,000	0	27,500	47,000	0	27,200
Mar.	119,000	0	69,900	119,000	0	66,700	119,000	0	66,300
April	261,000	0	164,300	261,000	0	158,900	261,000	0	158,500
May	261,000	0	164,400	261,000	0	164,000	261,000	0	164,400
June	261,000	0	164,400	261,000	0	164,400	261,000	0	164,400
July	261,000	0	163,400	261,000	0	163,300	261,000	0	160,400
Aug.	261,000	0	155,200	261,000	0	155,200	261,000	0	154,800
Sept.	236,000	0	138,200	236,000	0	138,200	236,000	0	137,500
Oct.	93,000	0	50,700	93,000	0	50,700	93,000	0	50,400
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	91,900	1,800,000	0	91,000	1,800,000	0	90,600
1912									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	28,000	47,000	0	28,000	47,000	0	27,900
Mar.	119,000	0	64,700	119,000	0	64,700	119,000	0	64,400
April	261,000	0	136,700	261,000	0	136,700	261,000	0	135,600
May	261,000	0	121,800	261,000	0	121,800	261,000	0	120,600
June	261,000	0	137,900	261,000	0	137,900	261,000	0	136,800
July	261,000	0	125,800	261,000	0	125,800	261,000	0	124,700
Aug.	261,000	0	102,700	261,000	0	102,700	261,000	0	101,100
Sept.	198,100	37,900	12,800	198,100	37,900	12,800	187,700	48,300	7,500
Oct.	17,800	75,200	0	17,800	75,200	0	17,800	75,200	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,686,900	113,100	60,900	1,686,900	113,100	60,900	1,676,500	123,500	59,900
1913									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	0	47,000	0	0	47,000	0	0
Mar.	79,300	39,700	0	79,300	39,700	0	79,300	39,700	0
April	95,800	165,200	0	95,800	165,200	0	95,800	165,200	0
May	219,200	41,800	0	219,200	41,800	0	219,200	41,800	0
June	197,700	63,300	0	197,700	63,300	0	197,700	63,300	0
July	102,000	159,000	0	102,000	159,000	0	102,000	159,000	0
Aug.	68,900	192,100	0	68,900	192,100	0	68,900	192,100	0
Sept.	40,600	195,400	0	40,600	195,400	0	40,600	195,400	0
Oct.	12,800	80,200	0	12,800	80,200	0	12,800	80,200	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	863,300	936,700	0	863,300	936,700	0	863,300	936,700	0

TABLE 11a (Continued). TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For correspondng yearly summary, see Table 11, page 138.)

Height of dam 595 feet. **Capacity of reservoir 1,071,000 acre-feet.**

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space requiree (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1914									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	22,800	47,000	0	22,800	47,000	0	22,800
Mar.	119,000	0	56,600	119,000	0	56,600	119,000	0	56,600
April	261,000	0	138,800	261,000	0	138,800	261,000	0	138,800
May	261,000	0	145,300	261,000	0	146,800	261,000	0	147,200
June	261,000	0	163,800	261,000	0	164,400	261,000	0	164,400
July	261,000	0	162,500	261,000	0	158,600	261,000	0	157,900
Aug.	261,000	0	156,100	261,000	0	156,100	261,000	0	149,700
Sept.	236,000	0	139,300	236,000	0	139,000	236,000	0	131,900
Oct.	93,000	0	51,300	93,000	0	51,200	93,000	0	47,800
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	86,600	1,800,000	0	86,400	1,800,000	0	85,000
1915									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,800	47,000	0	29,600	47,000	0	28,100
Mar.	119,000	0	68,100	119,000	0	67,900	119,000	0	64,400
April	261,000	0	153,100	261,000	0	152,800	261,000	0	144,600
May	261,000	0	149,900	261,000	0	151,100	261,000	0	142,100
June	261,000	0	163,300	261,000	0	164,400	261,000	0	161,900
July	261,000	0	160,800	261,000	0	156,500	261,000	0	156,900
Aug.	261,000	0	153,000	261,000	0	150,700	261,000	0	147,200
Sept.	236,000	0	134,600	236,000	0	131,400	236,000	0	123,800
Oct.	93,000	0	48,800	93,000	0	47,000	93,000	0	43,500
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	88,700	1,800,000	0	87,800	1,800,000	0	84,600
1916									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,000	47,000	0	28,400	47,000	0	27,300
Mar.	119,000	0	97,000	119,000	0	72,000	119,000	0	73,800
April	261,000	0	164,400	261,000	0	164,400	261,000	0	161,900
May	261,000	0	164,400	261,000	0	164,400	261,000	0	164,400
June	261,000	0	164,400	261,000	0	164,300	261,000	0	164,400
July	261,000	0	161,300	261,000	0	155,400	261,000	0	157,400
Aug.	261,000	0	153,800	261,000	0	151,700	261,000	0	146,100
Sept.	236,000	0	135,800	236,000	0	133,300	236,000	0	125,800
Oct.	93,000	0	50,100	93,000	0	48,900	93,000	0	45,400
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	93,500	1,800,000	0	90,300	1,800,000	0	89,000

TABLE 11a (Continued). TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For corresponding yearly summary, see Table 11, page 138.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-fee!	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-fee!	Average power yield in kilowatts (Load factor= 1.00)
1917									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,500	47,000	0	28,900	47,000	0	27,500
Mar.	119,000	0	68,400	119,000	0	67,300	119,000	0	64,400
April	261,000	0	152,500	261,000	0	149,700	261,000	0	142,400
May	261,000	0	149,600	261,000	0	147,400	261,000	0	140,900
June	261,000	0	162,600	261,000	0	161,400	261,000	0	159,400
July	261,000	0	159,100	261,000	0	159,100	261,000	0	154,000
Aug.	261,000	0	152,200	261,000	0	152,200	261,000	0	148,900
Sept.	236,000	0	133,200	236,000	0	133,200	236,000	0	121,800
Oct.	93,000	0	48,000	93,000	0	48,000	93,000	0	42,500
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	88,100	1,800,000	0	87,500	1,800,000	0	83,700
1918									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	27,200	47,000	0	27,200	47,000	0	24,400
Mar.	119,000	0	62,200	119,000	0	62,200	119,000	0	55,500
April	261,000	0	139,300	261,000	0	139,300	261,000	0	122,900
May	261,000	0	132,900	261,000	0	132,900	261,000	0	117,100
June	261,000	0	147,800	261,000	0	147,800	261,000	0	135,600
July	261,000	0	144,600	261,000	0	144,600	261,000	0	133,600
Aug.	261,000	0	132,100	261,000	0	132,100	261,000	0	116,000
Sept.	236,000	0	106,100	236,000	0	106,100	236,000	0	63,100
Oct.	93,000	0	38,300	93,000	0	38,300	93,000	0	5,400
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	77,700	1,800,000	0	77,700	1,800,000	0	64,600
1919									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	24,300	47,000	0	24,300	47,000	0	20,100
Mar.	119,000	0	55,000	119,000	0	55,000	119,000	0	45,400
April	261,000	0	118,600	261,000	0	118,600	261,000	0	94,600
May	261,000	0	121,500	261,000	0	121,500	261,000	0	101,600
June	261,000	0	130,600	261,000	0	130,600	261,000	0	112,400
July	261,000	0	109,500	261,000	0	109,500	261,000	0	52,200
Aug.	250,300	10,700	30,800	250,300	10,700	30,800	81,400	179,600	0
Sept.	23,000	213,000	0	23,000	213,000	0	23,000	213,000	0
Oct.	22,400	70,600	0	22,400	70,600	0	22,400	70,600	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,505,700	294,300	49,200	1,505,700	294,300	49,200	1,336,800	463,200	35,500

TABLE 11a (Continued). TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For corresponding yearly summary, see Table 11, page 138.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1920									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	0	47,000	0	0	47,000	0	0
Mar.	119,000	0	0	119,000	0	0	119,000	0	0
April	198,000	63,000	0	198,000	63,000	0	198,000	63,000	0
May	259,600	1,400	2,600	259,600	1,400	2,600	259,600	1,400	2,600
June	261,000	0	95,700	261,000	0	95,700	261,000	0	95,700
July	261,000	0	50,500	261,000	0	50,500	261,000	0	50,500
Aug.	108,900	152,100	0	108,900	152,100	0	108,900	152,100	0
Sept.	29,200	206,800	0	29,200	206,800	0	29,200	206,800	0
Oct.	37,000	56,000	0	37,000	56,000	0	37,000	56,000	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,320,700	479,300	12,300	1,320,700	479,300	12,300	1,320,700	479,300	12,300
1921									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	17,100	47,000	0	17,100	47,000	0	17,100
Mar.	119,000	0	42,900	119,000	0	42,900	119,000	0	42,900
April	261,000	0	90,700	261,000	0	90,700	261,000	0	90,700
May	261,000	0	88,400	261,000	0	88,400	261,000	0	88,400
June	261,000	0	110,100	261,000	0	110,100	261,000	0	110,100
July	261,000	0	109,900	261,000	0	109,900	261,000	0	109,900
Aug.	261,000	0	52,000	261,000	0	52,000	261,000	0	52,000
Sept.	78,700	157,300	0	78,700	157,300	0	78,700	157,300	0
Oct.	26,300	66,700	0	26,300	66,700	0	26,300	66,700	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,576,000	224,000	42,700	1,576,000	224,000	42,700	1,576,000	224,000	42,700
1922									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	17,400	47,000	0	17,400	47,000	0	17,400
Mar.	119,000	0	41,000	119,000	0	41,000	119,000	0	41,000
April	261,000	0	42,800	261,000	0	42,800	261,000	0	42,800
May	261,000	0	96,200	261,000	0	96,200	261,000	0	96,200
June	261,000	0	148,300	261,000	0	148,300	261,000	0	148,900
July	261,000	0	154,600	261,000	0	154,600	261,000	0	156,100
Aug.	261,000	0	150,000	261,000	0	150,000	261,000	0	144,900
Sept.	236,000	0	131,000	236,000	0	131,000	236,000	0	124,300
Oct.	93,000	0	46,900	93,000	0	46,900	93,000	0	43,800
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	69,300	1,800,000	0	69,300	1,800,000	0	68,200

TABLE 11a (Concluded). TEMPERANCE FLAT RESERVOIR ON SAN JOAQUIN RIVER.

SUMMARY OF WATER AND POWER YIELD BY MONTHS BOTH WITH AND WITHOUT FLOOD CONTROL.

Summary of Tables 9a and 10a.

(For corresponding yearly summary, see Table 11, page 138.)

Height of dam 595 feet. Capacity of reservoir 1,071,000 acre-feet.

Seasonal irrigation yield, 1,800,000 acre-feet. (Supplemented by ground water supply in years of deficiency. No deduction for downstream prior rights).

Installed capacity of power plant 220,000 k.v.a. P.F. = 0.80.

Year and month	Without flood control			Coordinated with flood control by reservoir operating diagram. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft. Maximum reservoir space required—rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.			Flood control, holding maximum reservoir space required (rain-water floods, 133,000 ac.-ft.; snow-water floods, 177,000 ac.-ft.) in reserve throughout flood season. Maximum controlled flow at Friant—rain-water floods, 10,700 sec.-ft.; snow-water floods, 14,200 sec.-ft.		
	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)	Irrigation draft in acre-feet (no deduction for downstream prior rights)	Deficiency in irrigation supply in acre-feet	Average power yield in kilowatts (Load factor= 1.00)
1923									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	29,000	47,000	0	29,000	47,000	0	27,800
Mar.	119,000	0	65,600	119,000	0	65,600	119,000	0	62,900
April	261,000	0	145,400	261,000	0	145,400	261,000	0	138,500
May	261,000	0	143,800	261,000	0	143,800	261,000	0	137,800
June	261,000	0	154,200	261,000	0	154,200	261,000	0	149,300
July	261,000	0	149,500	261,000	0	149,500	261,000	0	145,300
Aug.	261,000	0	142,300	261,000	0	142,300	261,000	0	135,500
Sept.	236,000	0	119,900	236,000	0	119,900	236,000	0	110,800
Oct.	93,000	0	42,200	93,000	0	42,200	93,000	0	38,200
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,800,000	0	82,900	1,800,000	0	82,900	1,800,000	0	79,000
1924									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	24,100	47,000	0	24,100	47,000	0	22,300
Mar.	119,000	0	54,000	119,000	0	54,000	119,000	0	48,700
April	261,000	0	102,600	261,000	0	102,600	261,000	0	51,500
May	261,000	0	34,100	261,000	0	34,100	218,200	42,800	0
June	95,100	165,900	0	95,100	165,900	0	37,800	223,200	0
July	20,600	240,400	0	20,600	240,400	0	20,600	240,400	0
Aug.	16,200	244,800	0	16,200	244,800	0	16,200	244,800	0
Sept.	12,700	223,300	0	12,700	223,300	0	12,700	223,300	0
Oct.	11,700	81,300	0	11,700	81,300	0	11,700	81,300	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	844,300	955,700	17,800	844,300	955,700	17,800	744,200	1,055,800	10,100
1925									
Jan.	0	0	0	0	0	0	0	0	0
Feb.	47,000	0	0	47,000	0	0	47,000	0	0
Mar.	119,000	0	0	119,000	0	0	119,000	0	0
April	261,000	0	0	261,000	0	0	261,000	0	0
May	261,000	0	0	261,000	0	0	261,000	0	0
June	261,000	0	19,000	261,000	0	19,000	261,000	0	19,000
July	261,000	0	15,300	261,000	0	15,300	261,000	0	15,300
Aug.	101,300	159,700	0	101,300	159,700	0	101,300	159,700	0
Sept.	37,100	198,900	0	37,100	198,900	0	37,100	198,900	0
Oct.	39,200	53,800	0	39,200	53,800	0	39,200	53,800	0
Nov.	0	0	0	0	0	0	0	0	0
Dec.	0	0	0	0	0	0	0	0	0
Total or average	1,387,600	412,400	2,900	1,387,600	412,400	2,900	1,387,600	412,400	2,900
Total for 18-year period, 1908-1926	**28,984,500**	**3,415,500**		**28,984,500**	**3,415,500**		**28,705,100**	**3,694,900**	
Average for 18-year period, 1908-1926	**1,610,300**	**189,700**	**62,000**	**1,610,300**	**189,700**	**61,400**	**1,594,700**	**205,300**	**58,300**

ASSUMPTIONS EMPLOYED IN COMPUTING WATER YIELD OF SAN GABRIEL RESERVOIR ON SAN GABRIEL RIVER ON A DAILY BASIS

1. Water supply at dam site is the same as that measured at the Azusa gaging station of the United States Geological Survey and published, or in preparation for publication, as mean daily discharges in the Water Supply Papers, except that the first 152 second-feet of natural flow is deducted for downstream prior rights.

2. The reservoir is assumed to have all space filled below the 117,350 acre-feet flood control reserve of January 1, 1897. This was later found to be an improbable condition for 240,000 acre-feet of capacity employed for flood control, seasonal and over-year storage coordinated, but quite probable for 180,000 acre-feet of capacity or less. Tables 13 and 13a show a yield of 41 second-feet continuous flow on this assumption for 240,000 acre-feet of capacity, but the period ends with 61,300 acre-feet less water in storage than at the beginning. The exact yield in continuous flow for the period analyzed is 32 second-feet. The exact yield in flood control and seasonally stored water for the period is 22,300 and 25,900 acre-feet per season, respectively. It is given as 30,000 and 13,800 acre-feet per season, respectively, in Tables 13 and 13a. The yield in continuous flow of 240,000 acre-feet of capacity with such water in storage on January 1, 1897, as probably could have accumulated during the seasons immediately preceding 1897, is closer to the 41 second-feet of Tables 13 and 13a than to 32 second-feet, the exact yield for the period of analysis. The exact yields of the period of analysis are used in the text for comparative purposes in order to place the information compared on the same basis.

3. The net evaporation from the reservoir surface equals 4.0 feet depth per annum, divided among the months as follows:

Month	*Depth in feet*	*Per cent of seasonal total*
April	0.37	9.2
May	0.50	12.6
June	0.60	15.0
July	0.71	17.8
August	0.66	16.6
September	0.51	12.7
October	0.39	9.6
November	0.26	6.5
Totals	4.00	100.0

TABLE 12a. SAN GABRIEL RESER

WATER YIELD UNDER

FLOOD CONTROL AND SEAS

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1897										
Jan.	3,617	0	3,617	0	0	0	0	0	3,617	0
Feb.	19,146	0	7,262	4,913	0	0	0	0	7,262	0
Mar.	28,623	6,971	9,344	0	0	0	0	11,884	9,344	0
April	17,519	26,250	9,042	0	4,164	131	0	31,163	9,042	0
May	8,851	30,432	8,126	0	5,963	194	0	34,535	8,126	0
June	4,033	25,000	4,033	0	5,985	206	0	28,236	4,033	0
July	2,343	18,809	2,343	0	6,185	212	0	21,244	2,343	0
Aug.	1,613	12,412	1,613	0	6,185	149	0	14,020	1,613	0
Sept.	1,226	6,078	1,226	0	6,006	72	0	6,855	1,226	0
Oct.	5,564	0	2,622	0	0	0	0	0	2,622	0
Nov.	1,860	2,942	1,860	0	0	20	0	2,942	1,860	0
Dec.	1,875	2,922	1,875	0	0	0	0	2,922	1,875	0
Total or average	96,270		52,963	4,913	34,488	984	0		52,963	0
1898										
Jan.	2,453	2,922	2,453	0	0	0	0	2,922	2,453	0
Feb.	2,241	2,922	2,241	0	0	0	0	2,922	2,241	0
Mar.	2,131	2,922	2,131	0	0	0	0	2,922	2,131	0
April	1,950	2,922	1,950	0	448	34	0	2,922	1,950	0
May	2,213	2,440	2,213	0	462	39	0	2,440	2,213	0
June	1,159	1,939	1,159	0	448	39	0	1,939	1,159	0
July	672	1,452	672	0	464	40	0	1,452	672	0
Aug.	456	948	456	0	462	26	0	948	456	0
Sept.	467	460	467	0	448	12	0	460	467	0
Oct.	533	0	533	0	0	0	0	0	533	0
Nov.	580	0	580	0	0	0	0	0	580	0
Dec.	832	0	832	0	0	0	0	0	832	0
Total or average	15,687		15,687	0	2,732	190	0		15,687	0
1899										
Jan.	1,414	0	1,414	0	0	0	0	0	1,414	0
Feb.	1,244	0	1,244	0	0	0	0	0	1,244	0
Mar.	1,623	0	1,623	0	0	0	0	0	1,623	0
April	1,262	0	1,262	0	0	0	0	0	1,262	0
May	842	0	842	0	0	0	0	0	842	0
June	565	0	565	0	0	0	0	0	565	0
July	221	0	221	0	0	0	0	0	221	0
Aug.	295	0	295	0	0	0	0	0	295	0
Sept.	220	0	220	0	0	0	0	0	220	0
Oct.	683	0	683	0	0	0	0	0	683	0
Nov.	847	0	847	0	0	0	0	0	847	0
Dec.	1,247	0	1,247	0	0	0	0	0	1,247	0
Total or average	10,463		10,463	0	0	0	0		10,463	0

VOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1897
0	0	0	0	3,617	0	0	0	0	Jan.
0	0	0	0	7,262	0	0	0	0	Feb.
0	0	0	11,884	9,344	0	0	0	0	Mar.
4,958	147	0	31,163	9,042	0	4,958	147	0	April
6,814	210	0	34,535	8,126	0	6,814	210	0	May
6,770	222	0	28,236	4,033	0	6,770	222	0	June
6,996	228	0	21,244	2,343	0	6,996	228	0	July
6,996	169	0	14,020	1,613	0	6,996	169	0	Aug.
6,770	85	0	6,855	1,226	0	6,770	85	0	Sept.
0	0	0	0	2,622	0	0	0	0	Oct.
0	20	0	2,942	1,860	0	0	20	0	Nov.
0	0	0	2,922	1,875	0	0	0	0	Dec.
39,304	1,081	0		52,963	0	39,304	1,081	0	Total or average
									1898
0	0	0	2,922	2,453	0	0	0	0	Jan.
0	0	0	2,922	2,241	0	0	0	0	Feb.
0	0	0	2,922	2,131	0	0	0	0	Mar.
448	34	0	2,922	1,950	0	448	34	0	April
462	39	0	2,440	2,213	0	462	39	0	May
448	39	0	1,939	1,159	0	448	39	0	June
464	40	0	1,452	672	0	464	40	0	July
462	26	0	948	456	0	462	26	0	Aug.
448	12	0	460	467	0	448	12	0	Sept.
0	0	0	0	533	0	0	0	0	Oct.
0	0	0	0	580	0	0	0	0	Nov.
0	0	0	0	832	0	0	0	0	Dec.
2,732	190	0		15,687	0	2,732	190	0	Total or average
									1899
0	0	0	0	1,414	0	0	0	0	Jan.
0	0	0	0	1,244	0	0	0	0	Feb.
0	0	0	0	1,623	0	0	0	0	Mar.
0	0	0	0	1,262	0	0	0	0	April
0	0	0	0	842	0	0	0	0	May
0	0	0	0	565	0	0	0	0	June
0	0	0	0	221	0	0	0	0	July
0	0	0	0	295	0	0	0	0	Aug.
0	0	0	0	220	0	0	0	0	Sept.
0	0	0	0	683	0	0	0	0	Oct.
0	0	0	0	847	0	0	0	0	Nov.
0	0	0	0	1,247	0	0	0	0	Dec.
0	0	0		10,463	0	0	0	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1900										
Jan.	1,968	0	1,968	0	0	0	0	0	1,968	0
Feb.	1,111	0	1,111	0	0	0	0	0	1,111	0
Mar.	1,230	0	1,230	0	0	0	0	0	1,230	0
April	1,012	0	1,012	0	0	0	0	0	1,012	0
May	2,275	0	2,275	0	0	0	0	0	2,275	0
June	893	0	893	0	0	0	0	0	893	0
July	369	0	369	0	0	0	0	0	369	0
Aug.	246	0	246	0	0	0	0	0	246	0
Sept.	238	0	238	0	0	0	0	0	238	0
Oct.	307	0	307	0	0	0	0	0	307	0
Nov.	11,068	0	1,058	0	0	0	0	0	1,058	0
Dec.	1,269	10,010	1,269	0	0	0	0	10,010	1,269	0
Total or average	21,986		11,976	0	0	0	0		11,976	0
1901										
Jan.	10,391	10,010	6,661	12,810	0	0	0	10,010	6,661	0
Feb.	38,709	930	8,350	19,884	0	0	0	13,740	8,350	0
Mar.	13,589	11,405	9,138	0	0	0	0	44,099	9,138	0
April	6,545	15,856	6,545	0	2,499	99	0	48,550	6,545	0
May	7,440	13,258	6,990	0	2,582	117	0	40,600	6,990	0
June	3,749	11,009	3,749	0	2,618	129	0	32,799	3,749	0
July	1,845	8,262	1,845	0	2,704	125	0	24,679	1,845	0
Aug.	1,240	5,433	1,240	0	2,704	79	0	16,295	1,240	0
Sept.	1,012	2,650	1,012	0	2,610	40	0	7,971	1,012	0
Oct.	1,476	0	1,476	0	0	0	0	0	1,476	0
Nov.	1,904	0	1,904	0	0	0	0	0	1,904	0
Dec.	1,660	0	1,660	0	0	0	0	0	1,660	0
Total or average	89,560		50,570	32,694	15,717	589	0		50,570	0
1902										
Jan.	1,722	0	1,722	0	0	0	0	0	1,722	0
Feb.	2,055	0	2,055	0	0	0	0	0	2,055	0
Mar.	6,088	0	5,590	0	0	0	0	0	5,590	0
April	3,928	498	3,928	0	72	8	0	498	3,928	0
May	2,398	418	2,398	0	73	11	0	418	2,398	0
June	1,190	334	1,190	0	72	12	0	334	1,190	0
July	676	250	676	0	74	12	0	250	676	0
Aug.	430	164	430	0	74	12	0	164	430	0
Sept.	298	78	298	0	72	6	0	78	298	0
Oct.	430	0	430	0	0	0	0	0	430	0
Nov.	1,131	0	1,131	0	0	0	0	0	1,131	0
Dec.	1,968	0	1,968	0	0	0	0	0	1,968	0
Total or average	22,314		21,816	0	437	61	0		21,816	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.
tions Carried Out on a Daily Basis.
mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.
onal storage each year.

feet capacity			240,000 acre-feet capacity						Year and month
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	
									1900
0	0	0	0	1,968	0	0	0	0	Jan.
0	0	0	0	1,111	0	0	0	0	Feb.
0	0	0	0	1,230	0	0	0	0	Mar.
0	0	0	0	1,012	0	0	0	0	April
0	0	0	0	2,275	0	0	0	0	May
0	0	0	0	893	0	0	0	0	June
0	0	0	0	369	0	0	0	0	July
0	0	0	0	246	0	0	0	0	Aug.
0	0	0	0	238	0	0	0	0	Sept.
0	0	0	0	307	0	0	0	0	Oct.
0	0	0	0	1,058	0	0	0	0	Nov.
0	0	0	10,010	1,269	0	0	0	0	Dec.
0	0	0		11,976	0	0	0	0	Total or average
									1901
0	0	0	10,010	6,661	0	0	0	0	Jan.
0	0	0	13,740	8,350	0	0	0	0	Feb.
0	0	0	44,099	9,138	0	0	0	0	Mar.
7,763	187	0	48,550	6,545	0	7,763	187	0	April
8,023	228	0	40,600	6,990	0	8,023	228	0	May
7,878	242	0	32,799	3,749	0	7,878	242	0	June
8,140	244	0	24,679	1,845	0	8,140	244	0	July
8,140	184	0	16,295	1,240	0	8,140	184	0	Aug.
7,878	93	0	7,971	1,012	0	7,878	93	0	Sept.
0	0	0	0	1,476	0	0	0	0	Oct.
0	0	0	0	1,904	0	0	0	0	Nov.
0	0	0	0	1,660	0	0	0	0	Dec.
47,822	1,178	0		50,570	0	47,822	1,178	0	Total or average
									1902
0	0	0	0	1,722	0	0	0	0	Jan.
0	0	0	0	2,055	0	0	0	0	Feb.
0	0	0	0	5,590	0	0	0	0	Mar.
72	8	0	498	3,928	0	72	8	0	April
73	11	0	418	2,398	0	73	11	0	May
72	12	0	334	1,190	0	72	12	0	June
74	12	0	250	676	0	74	12	0	July
74	12	0	164	430	0	74	12	0	Aug.
72	6	0	78	298	0	72	6	0	Sept.
0	0	0	0	430	0	0	0	0	Oct.
0	0	0	0	1,131	0	0	0	0	Nov.
0	0	0	0	1,968	0	0	0	0	Dec.
437	61	0		21,816	0	437	61	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1903										
Jan.	9,100	0	2,536	4,856	0	0	0	0	2,536	0
Feb.	5,665	1,708	5,497	1,189	0	0	0	6,554	5,497	0
Mar.	15,802	687	7,898	0	0	0	0	6,732	7,898	0
April	47,127	8,591	9,042	0	1,344	67	0	14,636	9,042	0
May	13,343	45,265	9,116	0	8,963	244	0	50,322	9,116	0
June	5,653	40,285	5,653	0	9,703	272	0	44,322	5,653	0
July	2,644	30,310	2,644	0	10,026	270	0	33,358	2,644	0
Aug.	1,783	20,014	1,783	0	10,026	202	0	22,039	1,783	0
Sept.	1,488	9,786	1,488	0	9,685	101	0	10,789	1,488	0
Oct.	1,476	0	1,476	0	0	0	0	0	1,476	0
Nov	1,428	0	1,428	0	0	0	0	0	1,428	0
Dec.	1,476	0	1,476	0	0	0	0	0	1,476	0
Total or average	106,985		50,037	6,045	49,747	1,156	0		50,037	0
1904										
Jan.	1,500	0	1,500	0	0	0	0	0	1,500	0
Feb.	2,744	0	2,177	0	0	0	0	0	2,177	0
Mar.	6,813	567	4,724	0	0	0	0	597	4,724	0
April	5,337	2,656	5,337	0	407	29	0	2,656	5,337	0
May	4,089	2,220	4,089	0	420	37	0	2,220	4,089	0
June	1,517	1,763	1,517	0	407	36	0	1,763	1,517	0
July	861	1,320	861	0	420	36	0	1,320	861	0
Aug.	793	864	793	0	420	24	0	864	793	0
Sept.	643	420	643	0	408	12	0	420	643	0
Oct.	738	0	738	0	0	0	0	0	738	0
Nov.	762	0	762	0	0	0	0	0	762	0
Dec.	1,039	0	1,039	0	0	0	0	0	1,039	0
Total or average	26,836		24,180	0	2,482	174	0		24,180	0
1905										
Jan.	2,251	0	2,251	0	0	0	0	0	2,251	0
Feb.	25,880	0	8,206	11,798	0	0	0	0	8,206	0
Mar.	75,140	5,876	9,281	18,198	0	0	0	17,674	9,281	0
April	19,580	53,537	9,042	0	8,727	197	0	83,533	9,042	0
May	17,090	55,151	9,344	0	10,942	274	0	80,378	9,344	0
June	8,271	51,681	7,960	0	12,475	313	0	71,790	7,960	0
July	5,103	39,204	5,103	0	12,989	313	0	54,358	5,103	0
Aug.	2,631	25,902	2,631	0	12,989	232	0	35,935	2,631	0
Sept.	1,869	12,681	1,869	0	12,560	121	0	17,612	1,839	0
Oct.	1,770	0	1,770	0	0	0	0	0	1,770	0
Nov.	2,660	0	2,660	0	0	0	0	0	2,660	0
Dec.	2,470	0	2,470	0	0	0	0	0	2,470	0
Total or average	164,715		62,587	29,996	70,682	1,450	0		62,587	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.
tions Carried Out on a Daily Basis.
mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.
onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1903
0	0	0	0	2,536	0	0	0	0	Jan.
0	0	0	6,564	5,497	0	0	0	0	Feb.
0	0	0	6,732	7,898	0	0	0	0	Mar.
2,304	95	0	14,636	9,042	0	2,304	95	0	April
9,969	258	0	50,322	9,116	0	9,969	258	0	May
10,676	288	0	44,322	5,653	0	10,676	288	0	June
11,030	289	0	33,358	2,644	0	11,030	289	0	July
11,030	220	0	22,039	1,783	0	11,030	220	0	Aug.
10,676	113	0	10,789	1,488	0	10,676	113	0	Sept.
0	0	0	0	1,476	0	0	0	0	Oct.
0	0	0	0	1,428	0	0	0	0	Nov.
0	0	0	0	1,476	0	0	0	0	Dec.
55,685	1,263	0		50,037	0	55,685	1,263	0	Total or average
									1904
0	0	0	0	1,500	0	0	0	0	Jan.
0	0	0	0	2,177	0	0	0	0	Feb.
0	0	0	567	4,724	0	0	0	0	Mar.
407	29	0	2,656	5,337	0	407	29	0	April
420	37	0	2,220	4,089	0	420	37	0	May
407	36	0	1,763	1,517	0	407	36	0	June
420	36	0	1,320	861	0	420	36	0	July
420	24	0	864	793	0	420	24	0	Aug.
408	12	0	420	643	0	408	12	0	Sept.
0	0	0	0	738	0	0	0	0	Oct.
0	0	0	0	762	0	0	0	0	Nov.
0	0	0	0	1,039	0	0	0	0	Dec.
2,482	174	0		24,180	0	2,482	174	0	Total or average
									1905
0	0	0	0	2,251	0	0	0	0	Jan.
0	0	0	0	8,206	0	0	0	0	Feb.
0	0	0	17,674	9,281	0	0	0	0	Mar.
13,429	264	0	83,533	9,042	0	13,429	264	0	April
15,987	347	0	80,378	9,344	0	15,987	347	0	May
17,357	386	0	71,790	7,960	0	17,357	386	0	June
18,039	384	0	54,358	5,103	0	18,039	384	0	July
18,039	284	0	35,935	2,631	0	18,039	284	0	Aug.
17,459	153	0	17,612	1,869	0	17,459	153	0	Sept.
0	0	0	0	1,770	0	0	0	0	Oct.
0	0	0	0	2,660	0	0	0	0	Nov.
0	0	0	0	2,470	0	0	0	0	Dec.
100,310	1,818	0		62,587	0	100,310	1,818	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1906										
Jan.	4,240	0	3,633	0	0	0	0	0	3,633	0
Feb.	3,960	607	3,960	0	0	0	0	607	3,960	0
Mar.	129,000	607	7,561	24,303	0	0	0	607	7,561	2,864
April	34,600	97,743	9,042	19,634	11,660	274	0	119,182	9,042	0
May	21,000	91,733	9,344	0	18,263	375	0	125,198	9,344	0
June	15,500	84,751	9,042	0	20,518	426	0	111,414	9,042	0
July	9,350	70,265	8,664	0	22,606	452	0	90,348	8,664	0
Aug.	4,490	47,893	4,490	0	24,086	329	0	60,436	4,490	0
Sept.	2,840	23,478	2,840	0	23,305	173	0	29,637	2,840	0
Oct.	2,450	0	2,450	0	0	0	0	0	2,450	0
Nov.	2,400	0	2,400	0	0	0	0	0	2,400	0
Dec.	11,600	0	4,030	0	0	0	0	0	4,030	0
Total or average	241,430		67,456	43,937	120,438	2,029	0		67,456	2,864
1907										
Jan.	58,400	7,570	9,217	50,881	0	0	0	7,570	9,217	1,881
Feb.	47,100	5,872	8,439	31,125	0	0	0	54,872	8,439	31,125
Mar.	116,000	13,408	9,344	47,166	0	0	0	62,408	9,344	47,166
April	58,400	72,898	9,042	0	11,708	238	0	121,898	9,042	0
May	21,500	110,310	9,344	0	21,989	426	0	151,269	9,344	0
June	15,100	100,051	9,042	0	24,242	478	0	132,686	9,042	0
July	8,360	81,389	7,920	0	27,072	493	0	105,969	7,920	0
Aug.	5,390	54,264	5,390	0	27,300	359	0	70,528	5,390	0
Sept.	3,580	26,605	3,580	0	26,421	184	0	34,589	3,580	0
Oct.	4,090	0	4,090	0	0	0	0	0	4,090	0
Nov.	3,800	0	3,800	0	0	0	0	0	3,800	0
Dec.	3,600	0	3,600	0	0	0	0	0	3,600	0
Total or average	345,320		82,808	129,172	138,732	2,178	0		82,808	80,172
1908										
Jan.	11,100	0	4,973	4,617	0	0	0	0	4,973	0
Feb.	15,000	1,510	8,741	5,141	0	0	0	6,127	8,741	0
Mar.	12,700	2,628	9,255	0	0	0	0	12,386	9,255	0
April	9,280	6,073	8,656	0	952	52	0	15,831	8,656	0
May	7,190	5,693	7,139	0	1,106	69	0	13,860	7,139	0
June	4,190	4,569	4,190	0	1,071	61	0	11,067	4,190	0
July	2,560	3,437	2,560	0	1,106	57	0	8,309	2,560	0
Aug.	2,210	2,274	2,210	0	1,106	36	0	5,465	2,210	0
Sept.	1,820	1,132	1,820	0	1,120	12	0	2,665	1,820	0
Oct.	2,070	0	2,070	0	0	0	0	0	2,070	0
Nov.	1,960	0	1,960	0	0	0	0	0	1,960	0
Dec.	2,870	0	2,870	0	0	0	0	0	2,870	0
Total or average	72,950		56,444	9,758	6,461	287	0		56,444	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1906
0	0	0	0	3,633	0	0	0	0	Jan.
0	0	0	607	3,960	0	0	0	0	Feb.
0	0	0	607	7,561	0	0	0	0	Mar.
19,209	333	0	122,046	9,042	0	19,673	339	0	April
24,974	466	0	127,592	9,344	0	25,454	472	0	May
27,008	516	0	113,322	9,042	0	27,481	492	0	June
30,069	529	0	91,807	8,664	0	30,557	535	0	July
30,416	383	0	61,401	4,490	0	30,906	385	0	Aug.
29,437	200	0	30,110	2,840	0	29,910	200	0	Sept.
0	0	0	0	2,450	0	0	0	0	Oct.
0	0	0	0	2,400	0	0	0	0	Nov.
0	0	0	0	4,030	0	0	0	0	Dec.
161,113	2,427	0		67,456	0	163,981	2,423	0	Total or average
									1907
0	0	0	7,570	9,217	0	0	0	0	Jan.
0	0	0	56,753	8,439	0	0	0	0	Feb.
0	0	0	95,414	9,344	20,172	0	0	0	Mar.
19,650	337	0	181,898	9,042	0	29,388	446	0	April
30,209	530	0	201,422	9,344	0	40,265	650	0	May
32,194	581	0	172,663	9,042	0	41,941	700	0	June
35,292	589	0	136,080	7,920	0	45,367	698	0	July
35,517	422	0	90,455	5,390	0	45,589	496	0	Aug.
34,371	218	0	44,370	3,580	0	44,122	248	0	Sept.
0	0	0	0	4,090	0	0	0	0	Oct.
0	0	0	0	3,800	0	0	0	0	Nov.
0	0	0	0	3,600	0	0	0	0	Dec.
187,233	2,677	0		82,808	20,172	246,672	3,238	0	Total or average
									1908
0	0	0	0	4,973	0	0	0	0	Jan.
0	0	0	6,127	8,741	0	0	0	0	Feb.
0	0	0	12,386	9,255	0	0	0	0	Mar.
2,496	99	0	15,831	8,656	0	2,496	99	0	April
2,721	123	0	13,860	7,139	0	2,721	123	0	May
2,623	135	0	11,067	4,190	0	2,623	135	0	June
2,711	133	0	8,309	2,560	0	2,711	133	0	July
2,711	89	0	5,465	2,210	0	2,711	89	0	Aug.
2,625	40	0	2,665	1,820	0	2,625	40	0	Sept.
0	0	0	0	2,070	0	0	0	0	Oct.
0	0	0	0	1,960	0	0	0	0	Nov.
0	0	0	0	2,870	0	0	0	0	Dec.
15,887	619	0		56,444	0	15,887	619	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve of first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1909										
Jan.	25,500	0	5,596	19,385	0	0	0	0	5,596	0
Feb.	59,400	519	8,440	42,858	0	0	0	19,904	8,440	13,243
Mar.	26,300	8,621	9,344	0	0	0	0	57,621	9,344	0
April	28,000	25,577	9,042	0	4,063	131	0	74,577	9,042	0
May	15,200	40,341	9,344	0	7,980	228	0	81,312	9,344	0
June	8,570	37,989	8,319	0	9,144	260	0	70,645	8,319	0
July	5,040	28,836	5,040	0	9,528	264	0	53,434	5,040	0
Aug.	3,120	19,044	3,120	0	9,528	196	0	35,323	3,120	0
Sept.	2,320	9,320	2,320	0	9,225	95	0	17,314	2,320	0
Oct.	2,310	0	2,310	0	0	0	0	0	2,310	0
Nov.	2,880	0	2,880	0	0	0	0	0	2,880	0
Dec.	20,900	0	6,346	0	0	0	0	0	6,346	0
Total or average	199,540		72,101	62,243	49,468	1,174	0		72,101	13,243
1910										
Jan.	69,500	14,554	9,344	73,583	0	0	0	14,554	9,344	24,583
Feb.	11,500	1,127	8,435	2,689	0	0	0	50,127	8,435	2,689
Mar.	9,590	1,503	9,029	0	0	0	0	50,503	9,029	0
April	8,270	2,064	8,120	0	321	22	0	51,064	8,120	0
May	5,050	1,871	5,050	0	363	29	0	42,847	5,050	0
June	3 560	1,479	3,560	0	352	14	0	34,134	3,560	0
July	2,450	1,113	2,450	0	363	16	0	25,684	2,450	0
Aug.	1,710	734	1,710	0	363	16	0	16,957	1,710	0
Sept.	1,370	355	1,370	0	355	0	0	8,294	1,370	0
Oct.	1,560	0	1,560	0	0	0	0	0	1,560	0
Nov.	1,870	0	1,870	0	0	0	0	0	1,870	0
Dec.	2,020	0	2,020	0	0	0	0	0	2,020	0
Total or average	118,450		54,518	76,272	2,117	97	0		54,518	27,272
1911										
Jan.	37,200	0	6,441	7,031	0	0	0	0	6,441	0
Feb.	44,300	23,728	8,440	53,874	0	0	0	30,759	8,440	11,905
Mar.	122,000	5,714	9,344	57,434	0	0	0	54,714	9,344	57,434
April	28,200	60,936	9,042	0	9,774	212	0	109,936	9,042	0
May	16,600	70,108	9,344	0	13,936	317	0	111,071	9,344	0
June	7,500	63,111	7,322	0	15,247	357	0	95,757	7,322	0
July	5,230	47,685	5,230	0	15,816	355	0	72,274	5,230	0
Aug.	3,610	31,514	3,610	0	15,816	230	0	47,786	3,610	0
Sept.	2,830	15,438	2,830	0	15,303	135	0	23,427	2,830	0
Oct.	3,140	0	3,140	0	0	0	0	0	3,140	0
Nov.	2,800	0	2,800	0	0	0	0	0	2,800	0
Dec.	2,870	0	2,870	0	0	0	0	0	2,870	0
Total or average	276,280		70,413	118,339	85,892	1,636	0		70,413	69,339

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ALEXANDER

ONAL STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1909
0	0	0	0	5,596	0	0	0	0	Jan.
0	0	0	19,904	8,440	0	0	0	0	Feb.
0	0	0	70,864	9,344	0	0	0	0	Mar.
11,979	244	0	87,820	9,042	0	14,127	272	0	April
16,174	349	0	92,379	9,344	0	18,392	381	0	May
17,079	383	0	79,462	8,319	0	19,225	414	0	June
17,731	380	0	60,074	5,040	0	19,949	410	0	July
17,731	278	0	39,715	3,120	0	19,949	295	0	Aug.
17,165	149	0	19,471	2,320	0	19,314	157	0	Sept.
0	0	0	0	2,310	0	0	0	0	Oct.
0	0	0	0	2,880	0	0	0	0	Nov.
0	0	0	0	6,346	0	0	0	0	Dec.
97,859	1,783	0		72,101	0	110,956	1,929	0	Total or average
									1910
0	0	0	14,554	9,344	0	0	0	0	Jan.
0	0	0	74,710	8,435	0	0	0	0	Feb.
0	0	0	77,775	9,029	0	0	0	0	Mar.
8,174	193	0	78,336	8,120	0	12,588	250	0	April
8,475	238	0	65,648	5,050	0	13,036	306	0	May
8,202	248	0	52,306	3,560	0	12,616	317	0	June
8,475	252	0	39,373	2,450	0	13,036	317	0	July
8,475	188	0	26,020	1,710	0	13,036	238	0	Aug
8,199	95	0	12,746	1,370	0	12,625	121	0	Sept.
0	0	0	0	1,550	0	0	0	0	Oct.
0	0	0	0	1,870	0	0	0	0	Nov.
0	0	0	0	2,020	0	0	0	0	Dec.
50,000	1,214	0		54,518	0	76,937	1,549	0	Total or average
									1911
0	0	0	0	6,441	0	0	0	0	Jan.
0	0	0	30,759	8,440	0	0	0	0	Feb.
0	0	0	66,619	9,344	10,977	0	0	0	Mar.
17,708	315	0	168,298	9,042	0	27,179	423	0	April
22,142	428	0	159,854	9,344	0	31,928	551	0	May
23,105	466	0	134,631	7,322	0	32,670	585	0	June
24,026	462	0	101,554	5,230	0	33,815	573	0	July
24,026	333	0	67,166	3,610	0	33,815	408	0	Aug.
23,250	177	0	32,943	2,830	0	32,733	210	0	Sept.
0	0	0	0	3,140	0	0	0	0	Oct.
0	0	0	0	2,800	0	0	0	0	Nov.
0	0	0	0	2,870	0	0	0	0	Dec.
134,387	2,181	0		70,413	10,977	192,140	2,750	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1912										
Jan.	2,710	0	2,710	0	0	0	0	0	2,710	0
Feb.	2,230	0	2,230	0	0	0	0	0	2,230	0
Mar.	22,900	0	8,199	0	0	0	0	0	8,199	0
April	18,000	14,701	8,515	0	2,314	95	0	14,701	8,515	0
May	10,900	21,777	8,828	0	4,273	163	0	21,777	8,828	0
June	4,990	19,413	4,990	0	4,634	182	0	19,413	4,990	0
July	3,060	14,597	3,060	0	4,790	184	0	14,597	3,060	0
Aug.	1,960	9,623	1,960	0	4,790	135	0	9,623	1,960	0
Sept.	1,550	4,698	1,550	0	4,634	64	0	4,698	1,550	0
Oct.	1,830	0	1,830	0	0	0	0	0	1,830	0
Nov.	1,730	0	1,730	0	0	0	0	0	1,730	0
Dec.	1,760	0	1,760	0	0	0	0	0	1,760	0
Total or average	73,620		47,362	0	25,435	823	0		47,362	0
1913										
Jan.	2,910	0	2,910	0	0	0	0	0	2,910	0
Feb.	13,200	0	4,753	0	0	0	0	0	4,753	0
Mar.	10,200	8,447	8,759	0	0	0	0	8,447	8,759	0
April	7,140	9,888	7,091	0	1,547	75	0	9,888	7,091	0
May	4,970	8,315	4,970	0	1,608	93	0	8,315	4,970	0
June	2,890	6,614	2,890	0	1,557	95	0	6,614	2,890	0
July	1,690	4,962	1,690	0	1,607	93	0	4,962	1,690	0
Aug.	1,070	3,262	1,070	0	1,607	68	0	3,262	1,070	0
Sept.	893	1,587	893	0	1,555	32	0	1,587	893	0
Oct.	910	0	910	0	0	0	0	0	910	0
Nov.	2,280	0	2,280	0	0	0	0	0	2,280	0
Dec.	2,170	0	2,170	0	0	0	0	0	2,170	0
Total or average	50,323		40,386	0	9,481	456	0		40,386	0
1914										
Jan.	61,400	0	6,271	41,989	0	0	0	0	6,271	1,248
Feb.	121,000	13,140	8,440	59,505	0	0	0	53,881	8,440	51,246
Mar.	48,000	66,195	9,344	53,083	0	0	0	115,195	9,344	53,083
April	21,400	51,768	9,042	0	8,291	193	0	100,768	9,042	0
May	16,900	55,642	9,344	0	11,077	274	0	96,603	9,344	0
June	9,580	51,847	8,585	0	12,509	313	0	84,529	8,585	0
July	5,570	40,020	5,570	0	13,258	317	0	64,634	5,570	0
Aug.	3,630	26,445	3,630	0	13,258	238	0	42,731	3,630	0
Sept.	2,730	12,949	2,730	0	12,826	123	0	20,945	2,730	0
Oct.	2,770	0	2,770	0	0	0	0	0	2,770	0
Nov.	2,440	0	2,440	0	0	0	0	0	2,440	0
Dec.	4,290	0	4,290	0	0	0	0	0	4,290	0
Total or average	299,710		72,456	154,577	71,219	1,458	0		72,456	105,577

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1912
0	0	0	0	2,710	0	0	0	0	Jan.
0	0	0	0	2,230	0	0	0	0	Feb.
0	0	0	0	8,199	0	0	0	0	Mar.
2,314	95	0	14,701	8,515	0	2,314	95	0	April
4,273	163	0	21,777	8,828	0	4,273	163	0	May
4,634	182	0	19,413	4,990	0	4,634	182	0	June
4,790	184	0	14,597	3,060	0	4,790	184	0	July
4,790	135	0	9,623	1,960	0	4,790	135	0	Aug.
4,634	64	0	4,698	1,550	0	4,634	64	0	Sept.
0	0	0	0	1,830	0	0	0	0	Oct.
0	0	0	0	1,730	0	0	0	0	Nov.
0	0	0	0	1,760	0	0	0	0	Dec.
25,435	823	0		47,362	0	25,435	823	0	Total or average
									1913
0	0	0	0	2,910	0	0	0	0	Jan.
0	0	0	0	4,753	0	0	0	0	Feb.
0	0	0	8,447	8,759	0	0	0	0	Mar.
1,547	75	0	9,888	7,091	0	1,547	75	0	April
1,608	93	0	8,315	4,970	0	1,608	93	0	May
1,557	95	0	6,614	2,890	0	1,557	95	0	June
1,607	93	0	4,962	1,690	0	1,607	93	0	July
1,607	68	0	3,262	1,070	0	1,607	68	0	Aug.
1,555	32	0	1,587	893	0	1,555	32	0	Sept.
0	0	0	0	910	0	0	0	0	Oct.
0	0	0	0	2,280	0	0	0	0	Nov.
0	0	0	0	2,170	0	0	0	0	Dec.
9,481	456	0		40,386	0	9,481	456	0	Total or average
									1914
0	0	0	0	6,271	0	0	0	0	Jan.
0	0	0	55,129	8,440	18,017	0	0	0	Feb.
0	0	0	149,672	9,344	30,254	0	0	0	Mar.
16,225	298	0	158,074	9,042	0	25,519	405	0	April
19,239	391	0	144,508	9,344	0	28,847	514	0	May
20,460	430	0	122,703	8,585	0	29,763	549	0	June
21,473	430	0	93,386	5,570	0	31,083	543	0	July
21,473	313	0	61,760	3,630	0	31,083	389	0	Aug.
20,780	165	0	30,288	2,730	0	30,088	200	0	Sept.
0	0	0	0	2,770	0	0	0	0	Oct.
0	0	0	0	2,440	0	0	0	0	Nov.
0	0	0	0	4,290	0	0	0	0	Dec.
119,650	2,027	0		72,456	48,271	176,383	2,600	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1915										
Jan.	7,380	0	4,428	2,632	0	0	0	0	4,428	0
Feb.	30,200	320	8,412	13,196	0	0	0	2,952	8,412	0
Mar.	21,500	8,912	9,344	0	0	0	0	24,740	9,344	0
April	17,300	21,068	9,042	0	3,339	117	0	36,896	9,042	0
May	20,400	25,870	9,344	0	4,256	177	0	39,109	9,344	0
June	11,400	32,493	8,967	0	7,807	238	0	42,213	8,967	0
July	7,010	26,881	7,010	0	8,875	254	0	34,201	7,010	0
Aug.	3,980	17,752	3,980	0	8,875	190	0	22,595	3,980	0
Sept.	3,270	8,687	3,270	0	8,502	95	0	11,062	3,270	0
Oct.	2,770	0	2,770	0	0	0	0	0	2,770	0
Nov.	3,010	0	3,010	0	0	0	0	0	3,010	0
Dec.	3,580	0	3,580	0	0	0	0	0	3,580	0
Total or average	131,800		73,157	15,828	41,744	1,071	0		73,157	0
1916										
Jan.	148,000	0	8,759	52,702	0	0	0	0	8,759	49,196
Feb.	39,400	86,539	8,741	99,427	0	0	0	90,045	8,741	54,508
Mar.	34,800	17,771	9,344	18	0	0	0	66,196	9,344	0
April	19,900	43,209	9,042	0	6,913	174	0	91,652	9,042	0
May	10,400	46,980	9,130	0	9,304	248	0	87,483	9,130	0
June	5,830	38,698	5,830	0	9,314	264	0	70,993	5,830	0
July	4,770	29,120	4,770	0	9,624	264	0	53,444	4,770	0
Aug.	3,570	19,232	3,570	0	9,624	198	0	35,328	3,570	0
Sept.	2,810	9,410	2,810	0	9,314	96	0	17,314	2,810	0
Oct.	7,010	0	6,473	0	0	0	0	0	6,473	0
Nov.	4,130	537	4,130	0	0	7	0	537	4,130	0
Dec.	13,600	530	5,253	0	0	0	0	530	5,253	0
Total or average	294,220		77,852	152,147	54,093	1,251	0		77,852	103,704
1917										
Jan.	9,280	8,877	8,172	9,467	0	0	0	8,877	8,172	0
Feb.	13,200	518	7,551	0	0	0	0	9,985	7,551	0
Mar.	13,600	6,167	9,344	0	0	0	0	15,634	9,344	0
April	10,500	10,423	9,042	0	1,640	73	0	19,890	9,042	0
May	8,610	10,168	8,531	0	1,979	99	0	18,086	8,531	0
June	5,270	8,169	5,270	0	1,935	105	0	14,482	5,270	0
July	3,140	6,129	3,140	0	1,999	99	0	10,882	3,140	0
Aug.	2,200	4,031	2,200	0	1,999	67	0	7,169	2,200	0
Sept.	1,510	1,965	1,510	0	1,935	30	0	3,497	1,510	0
Oct.	1,560	0	1,560	0	0	0	0	0	1,560	0
Nov.	1,840	0	1,840	0	0	0	0	0	1,840	0
Dec.	2,000	0	2,000	0	0	0	0	0	2,000	0
Total or average	72,710		60,160	9,467	11,487	473	0		60,160	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.
tions Carried Out on a Daily Basis.
mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.
onal storage each year.

feet capacity			240,000 acre-feet capacity						Year and month
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	
									1915
0	0	0	0	4,428	0	0	0	0	Jan.
0	0	0	2,952	8,412	0	0	0	0	Feb.
0	0	0	24,740	9,344	0	0	0	0	Mar.
5,884	161	0	36,896	9,042	0	5,884	161	0	April
7,728	224	0	39,109	9,344	0	7,728	224	0	May
10,165	280	0	42,213	8,967	0	10,165	280	0	June
11,313	293	0	34,201	7,010	0	11,313	293	0	July
11,313	220	0	22,595	3,980	0	11,313	220	0	Aug.
10,947	115	0	11,062	3,270	0	10,947	115	0	Sept.
0	0	0	0	2,770	0	0	0	0	Oct.
0	0	0	0	3,010	0	0	0	0	Nov.
0	0	0	0	3,580	0	0	0	0	Dec.
57,350	1,293	0		73,157	0	57,350	1,293	0	Total or average
									1916
0	0	0	0	8,759	0	0	0	0	Jan.
0	0	0	139,241	8,741	43,704	0	0	0	Feb.
0	0	0	126,196	9,344	0	0	0	0	Mar.
14,747	280	0	151,652	9,042	0	24,473	393	0	April
17,393	367	0	137,644	9,130	0	27,472	496	0	May
17,165	384	0	110,946	5,830	0	26,895	513	0	June
17,736	380	0	83,538	4,770	0	27,793	498	0	July
17,736	278	0	55,247	3,570	0	27,793	363	0	Aug.
17,168	146	0	27,091	2,810	0	26,904	187	0	Sept.
0	0	0	0	6,473	0	0	0	0	Oct.
0	7	0	537	4,130	0	0	7	0	Nov.
0	0	0	530	5,253	0	0	0	0	Dec.
101,945	1,842	0		77,852	43,704	161,330	2,457	0	Total or average
									1917
0	0	0	8,877	8,172	0	0	0	0	Jan.
0	0	0	9,985	7,551	0	0	0	0	Feb.
0	0	0	15,634	9,344	0	0	0	0	Mar.
3,149	113	0	19,890	9,042	0	3,149	113	0	April
3,536	147	0	18,086	8,531	0	3,536	147	0	May
3,446	154	0	14,482	5,270	0	3,446	154	0	June
3,561	152	0	10,882	3,140	0	3,561	152	0	July
3,561	111	0	7,169	2,200	0	3,561	111	0	Aug.
3,445	52	0	3,497	1,510	0	3,445	52	0	Sept
0	0	0	0	1,560	0	0	0	0	Oct.
0	0	0	0	1,840	0	0	0	0	Nov.
0	0	0	0	2,000	0	0	0	0	Dec.
20,698	729	0		60,160	0	20,698	729	(	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1918										
Jan.	2,020	0	2,020	0	0	0	0	0	2,020	0
Feb.	9,330	0	3,847	0	0	0	0	0	3,847	0
Mar.	73,200	5,483	9,249	11,341	0	0	0	5,483	9,249	0
April	17,000	58,093	9,042	0	9,314	206	0	69,434	9,042	0
May	10,000	56,531	8,993	0	11,216	276	0	66,012	8,993	0
June	6,010	46,046	6,010	0	11,097	292	0	53,603	6,010	0
July	3,970	34,657	3,970	0	11,467	293	0	40,347	3,970	0
Aug.	2,840	22,897	2,840	0	11,467	218	0	26,663	2,840	0
Sept.	2,330	11,212	2,330	0	11,099	113	0	13,060	2,330	0
Oct.	2,930	0	2 930	0	0	0	0	0	2,930	0
Nov.	3,140	0	3,140	0	0	0	0	0	3,140	0
Dec.	4,370	0	4,370	0	0	0	0	0	4,370	0
Total or average	137,140		58,741	11,341	65,660	1,398	0		58,741	0
1919										
Jan.	3,300	0	3,300	0	0	0	0	0	3,300	0
Feb.	4,110	0	4 110	0	0	0	0	0	4,110	0
Mar.	6,110	0	6,110	0	0	0	0	0	6,110	0
April	6,010	0	6,010	0	0	0	0	0	6,010	0
May	3,810	0	3,810	0	0	0	0	0	3,810	0
June	1,890	0	1,890	0	0	0	0	0	1,890	0
July	1,320	0	1,320	0	0	0	0	0	1,320	0
Aug.	935	0	935	0	0	0	0	0	935	0
Sept.	1,010	0	1,010	0	0	0	0	0	1,010	0
Oct.	2,040	0	2,040	0	0	0	0	0	2,040	0
Nov.	2,130	0	2,130	0	0	0	0	0	2,130	0
Dec.	5,340	0	5,209	0	0	0	0	0	5,209	0
Total or average	38,005		37,874	0	0	0	0		37,874	0
1920										
Jan.	3,260	131	3,260	0	0	0	0	131	3,260	0
Feb.	12,700	131	5,854	0	0	0	0	131	5,854	0
Mar.	36,200	6,977	9,344	0	0	0	0	6,977	9,344	0
April	25,100	33,833	9,042	0	5,389	153	0	33,833	9,042	0
May	12,600	44,349	9,344	0	8,776	240	0	44,349	9,344	0
June	7,380	38,589	7,349	0	9,286	264	0	38,589	7,349	0
July	4,670	29,070	4,670	0	9,603	270	0	29,070	4,670	0
Aug.	3,200	19,197	3,200	0	9,603	200	0	19,197	3,200	0
Sept.	2,030	9,394	2,030	0	9,292	102	0	9,394	2,030	0
Oct.	2,000	0	2,000	0	0	0	0	0	2,000	0
Nov.	2,380	0	2,380	0	0	0	0	0	2,380	0
Dec.	2,210	0	2,210	0	0	0	0	0	2,210	0
Total or average	113,730		60,683	0	51,949	1,229	0		60,683	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

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mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1918
0	0	0	0	2,020	0	0	0	0	Jan.
0	0	0	0	3,847	0	0	0	0	Feb.
0	0	0	5,483	9,249	0	0	0	0	Mar.
11,146	234	0	69,434	9,042	0	11,146	234	0	April
13,110	306	0	66,012	8,993	0	13,110	306	0	May
12,933	323	0	53,603	6,010	0	12,933	323	0	June
13,363	321	0	40,347	3,970	0	13,363	321	0	July
13,363	240	0	26,663	2,840	0	13,363	240	0	Aug.
12,933	127	0	13,060	2,330	0	12,933	127	0	Sept.
0	0	0	0	2,930	0	0	0	0	Oct.
0	0	0	0	3,140	0	0	0	0	Nov.
0	0	0	0	4,370	0	0	0	0	Dec.
76,848	1,551	0		58,741	0	76,848	1,551	0	Total or average
									1919
0	0	0	0	3,300	0	0	0	0	Jan.
0	0	0	0	4,110	0	0	0	0	Feb.
0	0	0	0	6,110	0	0	0	0	Mar.
0	0	0	0	6,010	0	0	0	0	April
0	0	0	0	3,810	0	0	0	0	May
0	0	0	0	1,890	0	0	0	0	June
0	0	0	0	1,320	0	0	0	0	July
0	0	0	0	935	0	0	0	0	Aug.
0	0	0	0	1,010	0	0	0	0	Sept.
0	0	0	0	2,040	0	0	0	0	Oct.
0	0	0	0	2,130	0	0	0	0	Nov.
0	0	0	0	5,209	0	0	0	0	Dec.
0	0	0		37,874	0	0	0	0	Total or average
									1920
0	0	0	131	3,260	0	0	0	0	Jan.
0	0	0	131	5,854	0	0	0	0	Feb.
0	0	0	6,977	9,344	0	0	0	0	Mar.
5,389	153	0	33,833	9,042	0	5,389	153	0	April
8,776	240	0	44,349	9,344	0	8,776	240	0	May
9,286	264	0	38,589	7,349	0	9,286	264	0	June
9,603	270	0	29,070	4,670	0	9,603	270	0	July
9,603	200	0	19,197	3,200	0	9,603	200	0	Aug.
9,292	102	0	9,394	2,030	0	9,292	102	0	Sept.
0	0	0	0	2,000	0	0	0	0	Oct.
0	0	0	0	2,380	0	0	0	0	Nov.
0	0	0	0	2,210	0	0	0	0	Dec.
51,949	1,229	0		60,683	0	51,949	1,229	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1921										
Jan.	5,160	0	4,405	0	0	0	0	0	4,405	0
Feb.	4,490	755	4,490	0	0	0	0	755	4,490	0
Mar.	15,400	755	7,288	0	0	0	0	755	7,288	0
April	6,070	8,867	6,070	0	1,386	67	0	8,867	6,070	0
May	15,700	7,414	6,835	0	1,432	85	0	7,414	6,835	0
June	8,980	14,762	7,920	0	3,510	155	0	14,762	7,920	0
July	3,830	12,157	3,830	0	3,978	169	0	12,157	3,830	0
Aug.	2,450	8,010	2,450	0	3,978	121	0	8,010	2,450	0
Sept.	1,840	3,911	1,840	0	3,859	52	0	3,911	1,840	0
Oct.	2,040	0	2,040	0	0	0	0	0	2,040	0
Nov.	1,800	0	1,800	0	0	0	0	0	1,800	0
Dec.	119,000	0	5,045	38,907	0	0	0	0	5,045	6,295
Total or average	186,760		54,013	38,907	18,143	649	0		54,013	6,295
1922										
Jan.	62,100	75,048	9,344	108,425	0	0	0	107,660	9,344	100,784
Feb.	88,900	19,379	8,440	83,060	0	0	0	59,632	8,440	74,313
Mar.	47,800	16,779	9,344	3,196	0	0	0	65,779	9,344	3,353
April	31,400	52,039	9,042	0	8,334	192	0	100,882	9,042	0
May	24,700	65,871	9,344	0	13,084	303	0	106,702	9,344	0
June	14,400	67,840	9,042	0	16,400	373	0	100,363	9,042	0
July	9,100	56,425	8,576	0	18,735	392	0	80,924	8,576	0
Aug.	5,080	37,822	5,080	0	18,997	287	0	54,037	5,080	0
Sept.	3,290	18,538	3,290	0	18,385	153	0	26,493	3,290	0
Oct.	3,110	0	3,110	0	0	0	0	0	3,110	0
Nov.	5,310	0	4,519	0	0	0	0	0	4,519	0
Dec.	21,500	791	8,456	0	0	0	0	791	8,456	0
Total or average	316,690		87,587	194,681	93,935	1,700	0		87,587	178,450
1923										
Jan.	7,130	13,835	6,968	13,042	0	0	0	13,835	6,968	0
Feb.	7,830	955	7,791	0	0	0	0	13,997	7 791	0
Mar.	7,320	994	7,320	0	0	0	0	14,036	7,320	0
April	8,330	994	8,079	0	157	8	0	14,036	8,079	0
May	5,480	1,080	5,480	0	210	12	0	11,983	5,480	0
June	3,700	858	3,700	0	204	12	0	9,537	3,700	0
July	2,420	642	2,420	0	212	8	0	7,159	2,420	0
Aug.	1,990	422	1,990	0	212	6	0	4,707	1,990	0
Sept.	1,750	204	1,750	0	204	0	0	2,293	1,750	0
Oct.	1,710	0	1,710	0	0	0	0	0	1,710	0
Nov.	1,960	0	1,960	0	0	0	0	0	1,960	0
Dec.	2,130	0	2,130	0	0	0	0	0	2,130	0
Total or average	51,750		51,298	13,042	1,199	46	0		51,298	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1921
0	0	0	0	4,405	0	0	0	0	Jan.
0	0	0	755	4,490	0	0	0	0	Feb.
0	0	0	755	7,288	0	0	0	0	Mar.
1,386	67	0	8,867	6,070	0	1,386	67	0	April
1,432	85	0	7,414	6,835	0	1,432	85	0	May
3,510	155	0	14,762	7,920	0	3,510	155	0	June
3,978	169	0	12,157	3,830	0	3,978	169	0	July
3,978	121	0	8,010	2,450	0	3,978	121	0	Aug.
3,859	52	0	3,911	1,840	0	3,859	52	0	Sept.
0	0	0	0	2,040	0	0	0	0	Oct.
0	0	0	0	1,800	0	0	0	0	Nov.
0	0	0	0	5,045	0	0	0	0	Dec.
18,143	649	0		54 013	0	18,143	649	0	Total or average
									1922
0	0	0	113,955	9,344	52,703	0	0	0	Jan.
0	0	0	114,008	8,440	68,689	0	0	0	Feb.
0	0	0	125,779	9,344	3,196	0	0	0	Mar.
16,241	297	0	161,039	9,042	0	25,999	411	0	April
21,277	418	0	156,987	9,344	0	31,353	545	0	May
24,317	480	0	140,445	9,042	0	34,086	603	0	June
26,917	494	0	111,114	8,576	0	37,012	611	0	July
27,185	359	0	74,015	5,080	0	37,280	434	0	Aug.
26,306	187	0	36,301	3,290	0	36,081	220	0	Sept.
0	0	0	0	3,110	0	0	0	0	Oct.
0	0	0	0	4,519	0	0	0	0	Nov.
0	0	0	791	8,456	0	0	0	0	Dec.
142,243	2,235	0		87,587	124,588	201,811	2,824	0	Total or average
									1923
0	0	0	13,835	6,968	0	0	0	0	Jan.
0	0	0	13,997	7,791	0	0	0	0	Feb.
0	0	0	14,036	7,320	0	0	0	0	Mar.
2,211	93	0	14,036	8,079	0	2,211	93	0	April
2,331	115	0	11,983	5,480	0	2,331	115	0	May
2,257	121	0	9,537	3,700	0	2,257	121	0	June
2,331	121	0	7,159	2,420	0	2,331	121	0	July
2,331	83	0	4,707	1,990	0	2,331	83	0	Aug.
2,253	40	0	2,293	1,750	0	2,253	40	0	Sept.
0	0	0	0	1,710	0	0	0	0	Oct.
0	0	0	0	1,960	0	0	0	0	Nov.
0	0	0	0	2,130	0	0	0	0	Dec.
13,714	573	0		51,298	0	13,714	573	0	Total or average

TABLE 12a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1924										
Jan.	2,170	0	2,170	0	0	0	0	0	2,170	0
Feb.	1,790	0	1,790	0	0	0	0	0	1,790	0
Mar.	4,130	0	3,714	0	0	0	0	0	3,714	0
April	6,190	416	6,190	0	59	8	0	416	6,190	0
May	3,650	349	3,650	0	61	10	0	349	3,650	0
June	1,660	278	1,660	0	59	10	0	278	1,660	0
July	1,000	209	1,000	0	61	12	0	209	1,000	0
Aug.	756	136	756	0	61	10	0	136	756	0
Sept.	744	65	744	0	59	6	0	65	744	0
Oct.	873	0	873	0	0	0	0	0	873	0
Nov.	1,190	0	1,190	0	0	0	0	0	1,190	0
Dec.	1,780	0	1,780	0	0	0	0	0	1,780	0
Total or average	25,933		25,517	0	360	56	0		25,517	0
1925										
Jan.	1,710	0	1,710	0	0	0	0	0	1,710	0
Feb.	1,620	0	1,620	0	0	0	0	0	1,620	0
Mar.	2,510	0	2,423	0	0	0	0	0	2,423	0
April	7,200	87	5,765	0	0	4	0	87	5,765	0
May	3,050	1,518	3,050	0	285	29	0	1,518	3,050	0
June	1,840	1,204	1,840	0	278	28	0	1,204	1,840	0
July	824	898	824	0	285	24	0	898	824	0
Aug.	621	589	621	0	285	16	0	589	621	0
Sept.	492	288	492	0	278	10	0	288	492	0
Oct.	873	0	873	0	0	0	0	0	873	0
Nov.	1,010	0	1,010	0	0	0	0	0	1,010	0
Dec.	1,650	0	1,650	0	0	0	0	0	1,650	0
Total or average	23,400		21,878	0	1,411	111	0		21,878	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.
tions Carried Out on a Daily Basis.
mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.
onal storage each year.

feet capacity			240,000 acre-feet capacity						
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
									1924
0	0	0	0	2,170	0	0	0	0	Jan.
0	0	0	0	1,790	0	0	0	0	Feb.
0	0	0	0	3,714	0	0	0	0	Mar.
59	8	0	416	6,190	0	59	8	0	April
61	10	0	349	3,650	0	61	10	0	May
59	10	0	278	1,660	0	59	10	0	June
61	12	0	209	1,000	0	61	12	0	July
61	10	0	136	756	0	61	10	0	Aug.
59	6	0	65	744	0	59	6	0	Sept.
0	0	0	0	873	0	0	0	0	Oct.
0	0	0	0	1,190	0	0	0	0	Nov.
0	0	0	0	1,780	0	0	0	0	Dec.
360	56	0		25,517	0	360	56	0	Total or average
									1925
0	0	0	0	1,710	0	0	0	0	Jan.
0	0	0	0	1,620	0	0	0	0	Feb.
0	0	0	0	2,423	0	0	0	0	Mar.
0	4	0	87	5,765	0	0	4	0	April
285	29	0	1,518	3,050	0	285	29	0	May
278	28	0	1,204	1,840	0	278	28	0	June
285	24	0	898	824	0	285	24	0	July
285	16	0	589	621	0	285	16	0	Aug.
278	10	0	288	492	0	278	10	0	Sept.
0	0	0	0	873	0	0	0	0	Oct.
0	0	0	0	1,010	0	0	0	0	Nov.
0	0	0	0	1,650	0	0	0	0	Dec.
1,411	111	0		21,878	0	1,411	111	0	Total or average

TABLE 12a (Concluded). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL AND SEAS
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-
Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity						180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
192										
Jan.	1,540	0	1,540	0	0	0	0	0	1,540	0
Feb.	7,940	0	5,485	0	0	0	0	0	5,485	0
Mar.	3,650	2,455	3,650	0	0	0	0	2,455	3,650	0
April	69,000	2,455	8,233	0	383	32	0	2,455	8,233	0
May	13,000	62,807	9,142	0	12,471	294	0	62,807	9,142	0
June	5,500	53,900	5,500	0	13,006	323	0	53,900	5,500	0
July	3,120	40,571	3,120	0	13,441	321	0	40,571	3,120	0
Aug.	2,070	26,809	2,070	0	13,441	239	0	26,809	2,070	0
Sept.	1,580	13,129	1,580	0	13,001	128	0	13,129	1,580	0
Oct.	0							0		
Nov.										
Dec.										
Total or average	107,400		40,320	0	65,743	1,337	0		40,320	0
Total for period, Jan. 1, 1897, to Oct. 1, 1926	**3,731,977**		**1,513,303**	**1,103,359**	**1,091,252**	**24,063**	**0**		**1,513,303**	**586,916**
Average for period, Jan. 1, 1897, to Oct. 1, 1926	**125,445**		**50,867**	**37,088**	**36,681**	**809**	**0**		**50,867**	**19,723**

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

ONAL STORAGE COORDINATED.
tions Carried Out on a Daily Basis.
mary, see Table 12, page 158.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.
onal storage each year.

feet capacity			240,000 acre-feet capacity						Year and month
Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	
									1926
0	0	0	0	1,540	0	0	0	0	Jan.
0	0	0	0	5,485	0	0	0	0	Feb.
0	0	0	2,455	3,650	0	0	0	0	Mar.
383	32	0	2,455	8,233	0	383	32	0	April
12,471	294	0	62,807	9,142	0	12,471	294	0	May
13,006	323	0	53,900	5,500	0	13,006	323	0	June
13,441	321	0	40,571	3,120	0	13,441	321	0	July
13,441	239	0	26,809	2,070	0	13,441	239	0	Aug.
13,001	128	0	13,129	1,580	0	13,001	128	0	Sept.
			0						Oct.
									Nov.
									Dec.
65,743	1,337	0		40,320	0	65,743	1,337	0	Total or average
1,600,181	**31,577**	**0**		**1,513,303**	**247,712**	**1,936,001**	**34,961**	**0**	**Total for period, Jan. 1, 1897, to Oct. 1, 1926**
53,788	**1,061**	**0**		**50,867**	**8.327**	**65,076**	**1.175**	**0**	**Average for period, Jan. 1, 1897, to Oct. 1, 1926**

TABLE 13a. SAN GABRIEL RESER

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Rur-off at Azusa in acre feet	Maximum flood control reserve cr first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1897											
Jan.	3,617	0	3,617	0	0	0	0	0	62,650	3,617	11,779
Feb.	19,146	0	7,262	4,913	0	0	0	0	49,519	7,262	4,628
Mar.	28,623	6,971	9,344	0	0	0	0	0	55,553	9,344	0
April	17,519	26,250	9,042	0	4,164	0	131	0	73,480	9,042	0
May	8,851	30,432	8,126	0	5,963	0	194	0	79,165	8,126	0
June	4,033	25,000	4,033	0	5,985	0	206	0	75,183	4,033	0
July	2,343	18,809	2,343	0	6,185	0	212	0	70,385	2,343	0
Aug.	1,613	12,412	1,613	0	6,185	0	149	0	65,389	1,613	0
Sept.	1,226	6,078	1,226	0	6,006	0	72	0	60,447	1,226	0
Oct.	5,564	0	2,622	0	0	0	0	0	55,695	2,622	0
Nov.	1,860	2,942	1,860	0	0	0	20	0	57,065	1,860	0
Dec.	1,875	2,922	1,875	0	0	0	0	0	55,613	1,875	0
Total or average	96,270		52,963	4,913	34,488	0	984	0		52,963	16,407
1898											
Jan.	2,453	2,922	2,453	0	0	0	0	0	54,261	2,453	0
Feb.	2,241	2,922	2,241	0	0	0	0	0	52,909	2,241	0
Mar.	2,131	2,922	2,131	0	0	0	0	0	51,687	2,131	0
April	1,950	2,922	1,950	0	448	0	34	0	50,335	1,950	0
May	2,213	2,440	2,213	0	462	0	39	0	48,836	2,213	0
June	1,159	1,939	1,159	0	448	0	39	0	47,232	1,159	0
July	672	1,452	672	0	464	0	40	0	45,627	672	0
Aug.	456	948	456	0	462	0	26	0	43,932	456	0
Sept.	467	460	467	0	448	0	12	0	42,267	467	0
Oct.	533	0	533	0	0	0	0	0	40,720	533	0
Nov.	580	0	580	0	0	0	0	0	39,189	580	0
Dec.	832	0	832	0	0	0	0	0	37,765	832	0
Total or average	15,687		15,687	0	2,732	0	190	0		15,687	0
1899											
Jan.	1,414	0	1,414	0	0	0	0	0	36,413	1,414	0
Feb.	1,244	0	1,244	0	0	0	0	0	35,061	1,244	0
Mar.	1,623	0	1,623	0	0	0	0	0	33,839	1,623	0
April	1,262	0	1,262	0	0	0	0	0	32,487	1,262	0
May	842	0	842	0	0	0	0	0	31,029	842	0
June	565	0	565	0	0	0	0	0	29,483	565	0
July	221	0	221	0	0	0	0	0	27,950	221	0
Aug.	295	0	295	0	0	0	0	0	26,338	295	0
Sept.	220	0	220	0	0	0	0	0	24,752	220	0
Oct.	683	0	683	0	0	0	0	0	23,268	683	0
Nov.	847	0	847	0	0	0	0	0	21,787	847	0
Dec.	1,247	0	1,247	0	0	0	0	0	20,395	1,247	0
Total or average	10,463		10,463	0	0	0	0	0		10,463	0

VOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1897
0	1,352	0	0	122,650	3,617	10,611	0	2,520	0	0	Jan.
0	1,222	0	0	109,519	7,262	4,478	0	2,276	0	0	Feb.
0	1,352	0	0	114,649	9,344	0	0	2,520	0	0	Mar.
1,249	1,309	234	0	131,408	9,042	0	0	2,439	363	0	April
3,012	1,352	343	0	137,083	8,126	0	0	2,520	494	0	May
3,093	1,309	396	0	134,794	4,033	0	0	2,439	583	0	June
3,197	1,352	447	0	131,772	2,343	0	0	2,520	674	0	July
3,197	1,352	393	0	128,578	1,613	0	0	2,520	621	0	Aug.
3,153	1,309	290	0	125,437	1,226	0	0	2,439	472	0	Sept.
0	1,352	220	0	122,526	2,622	0	0	2,520	357	0	Oct.
0	1,309	143	0	122,591	1,860	0	0	2,439	238	0	Nov.
0	1,352	0	0	119,914	1,875	0	0	2,520	0	0	Dec.
16,901	15,922	2,466	0		52,963	15,089	0	29,672	3,802	0	Total or average
											1898
0	1,352	0	0	117,394	2,453	0	0	2,520	0	0	Jan.
0	1,222	0	0	114,874	2,241	0	0	2,276	0	0	Feb.
0	1,352	0	0	112,598	2,131	0	0	2,520	0	0	Mar.
0	1,309	190	0	110,078	1,950	0	0	2,439	313	0	April
0	1,352	252	0	107,326	2,213	0	0	2,520	410	0	May
0	1,309	296	0	104,396	1,159	0	0	2,439	490	0	June
0	1,352	343	0	101,467	672	0	0	2,520	565	0	July
0	1,352	313	0	98,382	456	0	0	2,520	516	0	Aug.
0	1,309	238	0	95,346	467	0	0	2,439	391	0	Sept.
0	1,352	179	0	92,516	533	0	0	2,520	293	0	Oct.
0	1,309	115	0	89,703	580	0	0	2,439	192	0	Nov.
0	1,352	0	0	87,072	832	0	0	2,520	0	0	Dec.
0	15,922	1,926	0		15,687	0	0	29,672	3,170	0	Total or average
											1899
0	1,352	0	0	84,552	1,414	0	0	2,520	0	0	Jan.
0	1,222	0	0	82,032	1,244	0	0	2,276	0	0	Feb.
0	1,352	0	0	79,756	1,623	0	0	2,520	0	0	Mar.
0	1,309	149	0	77,236	1,262	0	0	2,439	246	0	April
0	1,352	194	0	74,551	842	0	0	2,520	325	0	May
0	1,309	224	0	71,706	565	0	0	2,439	383	0	June
0	1,352	260	0	68,884	221	0	0	2,520	440	0	July
0	1,352	234	0	65,924	295	0	0	2,520	399	0	Aug.
0	1,309	175	0	63,005	220	0	0	2,439	301	0	Sept.
0	1,352	129	0	60,265	683	0	0	2,520	224	0	Oct.
0	1,309	83	0	57,521	847	0	0	2,439	143	0	Nov.
0	1,352	0	0	54,939	1,247	0	0	2,520	0	0	Dec.
0	15,922	1,448	0		10,463	0	0	29,672	2,461	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1900											
Jan.	1,968	0	1,968	0	0	0	0	0	19,043	1,968	0
Feb.	1,111	0	1,111	0	0	0	0	0	17,691	1,111	0
Mar.	1,230	0	1,230	0	0	0	0	0	16,469	1,230	0
April	1,012	0	1,012	0	0	0	0	0	15,117	1,012	0
May	2,275	0	2,275	0	0	0	0	0	13,713	2,275	0
June	893	0	893	0	0	0	0	0	12,240	893	0
July	369	0	369	0	0	0	0	0	10,796	369	0
Aug.	246	0	246	0	0	0	0	0	9,295	246	0
Sept.	238	0	238	0	0	0	0	0	7,820	238	0
Oct.	307	0	307	0	0	0	0	0	6,426	307	0
Nov.	11,068	0	1,058	0	0	0	0	0	5,018	1,058	0
Dec.	1,269	10,010	1,269	0	0	0	0	0	13,687	1,269	0
Total or average	21,986		11,976	0	0	0	0	0		11,976	0
1901											
Jan.	10,391	10,010	6,661	12,810	0	0	0	0	12,335	6,661	0
Feb.	38,709	930	8,350	19,884	0	0	0	0	14,713	8,350	0
Mar.	13,589	11,405	9,138	0	0	0	0	0	43,850	9,138	0
April	6,545	15,856	6,545	0	2,499	0	99	0	46,949	6,545	0
May	7,440	13,258	6,990	0	2,582	0	117	0	45,459	6,990	0
June	3,749	11,009	3,749	0	2,618	0	129	0	44,317	3,749	0
July	1,845	8,262	1,845	0	2,704	0	125	0	42,722	1,845	0
Aug.	1,240	5,433	1,240	0	2,704	0	79	0	41,041	1,240	0
Sept.	1,012	2,650	1,012	0	2,610	0	40	0	39,389	1,012	0
Oct.	1,476	0	1,476	0	0	0	0	0	37,850	1,476	0
Nov.	1,904	0	1,904	0	0	0	0	0	36,327	1,904	0
Dec.	1,660	0	1,660	0	0	0	0	0	34,909	1,660	0
Total or average	89,560		50,570	32,694	15,717	0	589	0		50,570	0
1902											
Jan.	1,722	0	1,722	0	0	0	0	0	33,557	1,722	0
Feb.	2,055	0	2,055	0	0	0	0	0	32,205	2,055	0
Mar.	6,088	0	5,590	0	0	0	0	0	30,983	5,590	0
April	3,928	498	3,928	0	72	0	8	0	30,129	3,928	0
May	2,398	418	2,398	0	73	0	11	0	28,679	2,398	0
June	1,190	334	1,190	0	72	0	12	0	27,143	1,190	0
July	676	250	676	0	74	0	12	0	25,620	676	0
Aug.	430	164	430	0	74	0	12	0	24,022	430	0
Sept.	298	78	298	0	72	0	6	0	22,448	298	0
Oct.	430	0	430	0	0	0	0	0	20,972	430	0
Nov.	1,131	0	1,131	0	0	0	0	0	19,497	1,131	0
Dec.	1,968	0	1,968	0	0	0	0	0	18,111	1,968	0
Total or average	22,314		21,816	0	437	0	61	0		21,816	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1900
0	1,352	0	0	52,419	1,968	0	0	2,520	0	0	Jan.
0	1,222	0	0	49,899	1,111	0	0	2,276	0	0	Feb.
0	1,352	0	0	47,623	1,230	0	0	2,520	0	0	Mar.
0	1,309	95	0	45,103	1,012	0	0	2,439	176	0	April
0	1,352	121	0	42,488	2,275	0	0	2,520	230	0	May
0	1,309	135	0	39,738	893	0	0	2,439	264	0	June
0	1,352	149	0	37,035	369	0	0	2,520	299	0	July
0	1,352	123	0	34,216	246	0	0	2,520	268	0	Aug.
0	1,309	85	0	31,428	238	0	0	2,439	200	0	Sept.
0	1,352	56	0	28,789	307	0	0	2,520	145	0	Oct.
0	1,309	32	0	26,124	1,058	0	0	2,439	95	0	Nov.
0	1,352	0	0	33,600	1,269	0	0	2,520	0	0	Dec.
0	15,922	796	0		11,976	0	0	29,672	1,677	0	Total or average
											1901
0	1,352	0	0	31,080	6,661	0	0	2,520	0	0	Jan.
0	1,222	0	0	32,290	8,350	0	0	2,276	0	0	Feb.
0	1,352	0	0	60,373	9,138	0	0	2,520	0	0	Mar.
0	1,309	181	0	62,304	6,545	0	0	2,439	214	0	April
0	1,352	240	0	59,651	6,990	0	0	2,520	284	0	May
0	1,309	286	0	57,297	3,749	0	0	2,439	331	0	June
0	1,352	329	0	54,527	1,845	0	0	2,520	381	0	July
0	1,352	300	0	51,626	1,240	0	0	2,520	341	0	Aug.
0	1,309	230	0	48,765	1,012	0	0	2,439	256	0	Sept.
0	1,352	171	0	46,070	1,476	0	0	2,520	188	0	Oct.
0	1,309	109	0	43,362	1,904	0	0	2,439	121	0	Nov.
0	1,352	0	0	40,802	1,660	0	0	2,520	0	0	Dec.
0	15,922	1,846	0		50,570	0	0	29,672	2,116	0	Total or average
											1902
0	1,352	0	0	38,282	1,722	0	0	2,520	0	0	Jan.
0	1,222	0	0	35,762	2,055	0	0	2,276	0	0	Feb.
0	1,352	0	0	33,486	5,590	0	0	2,520	0	0	Mar.
0	1,309	141	0	31,464	3,928	0	0	2,439	143	0	April
0	1,352	184	0	28,882	2,398	0	0	2,520	182	0	May
0	1,309	214	0	26,180	1,190	0	0	2,439	208	0	June
0	1,352	246	0	23,533	676	0	0	2,520	232	0	July
0	1,352	222	0	20,781	430	0	0	2,520	202	0	Aug.
0	1,309	167	0	18,059	298	0	0	2,439	145	0	Sept.
0	1,352	123	0	15,475	430	0	0	2,520	99	0	Oct.
0	1,309	77	0	12,856	1,131	0	0	2,439	58	0	Nov.
0	1,352	0	0	10,359	1,968	0	0	2,520	0	0	Dec.
0	15,922	1,374	0		21,816	0	0	29,672	1,269	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1903											
Jan.	9,100	0	2,536	4,856	0	0	0	0	16,759	2,536	0
Feb.	5,665	1,708	5,497	1,189	0	0	0	0	21,971	5,497	0
Mar.	15,802	687	7,898	0	0	0	0	0	20,917	7,898	0
April	47,127	8,591	9,042	0	1,344	0	67	0	27,469	9,042	0
May	13,343	45,265	9,116	0	8,963	0	244	0	64,065	9,116	0
June	5,653	40,285	5,653	0	9,703	0	272	0	66,633	5,653	0
July	2,644	30,310	2,644	0	10,026	0	270	0	63,947	2,644	0
Aug.	1,783	20,014	1,783	0	10,026	0	202	0	61,067	1,783	0
Sept.	1,488	9,786	1,488	0	9,685	0	101	0	58,291	1,488	0
Oct.	1,476	0	1,476	0	0	0	0	0	55,623	1,476	0
Nov.	1,428	0	1,428	0	0	0	0	0	54,057	1,428	0
Dec.	1,476	0	1,476	0	0	0	0	0	52,609	1,476	0
Total or average	106,985		50,037	6,045	49,747	0	1,156	0		50,037	0
1904											
Jan.	1,500	0	1,500	0	0	0	0	0	51,257	1,500	0
Feb.	2,744	0	2,177	0	0	0	0	0	49,905	2,177	0
Mar.	6,813	567	4,724	0	0	0	0	0	49,207	4,724	0
April	5,337	2,656	5,337	0	407	0	29	0	49,944	5,337	0
May	4,089	2,220	4,089	0	420	0	37	0	48,447	4,089	0
June	1,517	1,763	1,517	0	407	0	36	0	46,845	1,517	0
July	861	1,320	861	0	420	0	36	0	45,240	861	0
Aug.	793	864	793	0	420	0	24	0	43,545	793	0
Sept.	643	420	643	0	408	0	12	0	41,880	643	0
Oct.	738	0	738	0	0	0	0	0	40,333	738	0
Nov.	762	0	762	0	0	0	0	0	38,802	762	0
Dec.	1,039	0	1,039	0	0	0	0	0	37,378	1,039	0
Total or average	26,836		24,180	0	2,482	0	174	0		24,180	0
1905											
Jan.	2,251	0	2,251	0	0	0	0	0	36,026	2,251	0
Feb.	25,880	0	8,206	11,798	0	0	0	0	34,674	8,206	0
Mar.	75,140	5,876	9,281	18,198	0	0	0	0	51,126	9,281	13,658
April	19,580	53,537	9,042	0	8,727	0	197	0	101,975	9,042	0
May	17,090	55,151	9,344	0	10,942	0	274	0	104,952	9,344	0
June	8,271	51,681	7,960	0	12,475	0	313	0	102,698	7,960	0
July	5,103	39,204	5,103	0	12,989	0	313	0	91,355	5,103	0
Aug.	2,631	25,902	2,631	0	12,989	0	232	0	79,225	2,631	0
Sept.	1,869	12,681	1,689	0	12,560	0	121	0	67,175	1,869	0
Oct.	1,770	0	1,770	0	0	0	0	0	55,631	1,770	0
Nov.	2,660	0	2,660	0	0	0	0	0	54,065	2,660	0
Dec.	2,470	0	2,470	0	0	0	0	0	52,617	2,470	0
Total or average	164,715		62,587	29,996	70,682	0	1,450	0		62,587	13,658

RESERVOIR ON SAN GABRIEL RIVER.

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mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1903
0	1,352	0	0	7,839	2,536	0	0	2,520	0	0	Jan.
0	1,222	0	0	11,883	5,497	0	0	2,276	0	0	Feb.
0	1,352	0	0	9,775	7,898	0	0	2,520	0	0	Mar.
0	1,309	180	0	15,159	9,042	0	0	2,439	171	0	April
0	1,352	307	0	50,634	9,116	0	0	2,520	268	0	May
1,012	1,309	365	0	52,073	5,653	0	0	2,439	311	0	June
1,107	1,352	421	0	49,323	2,644	0	0	2,520	359	0	July
1,045	1,352	379	0	46,444	1,783	0	0	2,520	321	0	Aug.
1,071	1,309	288	0	43,603	1,488	0	0	2,439	240	0	Sept.
0	1,352	214	0	40,924	1,476	0	0	2,520	176	0	Oct.
0	1,309	139	0	38,228	1,428	0	0	2,439	113	0	Nov.
0	1,352	0	0	35,676	1,476	0	0	2,520	0	0	Dec.
4,235	15,922	2,293	0		50,037	0	0	29,672	1,959	0	Total or average
											1904
0	1,352	0	0	33,156	1,500	0	0	2,520	0	0	Jan.
0	1,265	0	0	30,636	2,177	0	0	2,358	0	0	Feb.
0	1,352	0	0	28,845	4,724	0	0	2,520	0	0	Mar.
0	1,309	188	0	28,414	5,337	0	0	2,439	135	0	April
0	1,352	250	0	25,840	4,089	0	0	2,520	173	0	May
0	1,309	296	0	23,147	1,517	0	0	2,439	194	0	June
0	1,352	343	0	20,514	861	0	0	2,520	216	0	July
0	1,352	313	0	17,778	793	0	0	2,520	184	0	Aug.
0	1,309	238	0	15,074	643	0	0	2,439	129	0	Sept.
0	1,352	179	0	12,506	738	0	0	2,520	87	0	Oct.
0	1,309	115	0	9,899	762	0	0	2,439	50	0	Nov.
0	1,352	0	0	7,410	1,039	0	0	2,520	0	0	Dec.
0	15,965	1,922	0		24,180	0	0	29,754	1,168	0	Total or average
											1905
0	1,352	0	0	4,890	2,251	0	0	2,520	0	0	Jan.
0	1,222	0	0	2,370	8,206	0	0	2,276	0	0	Feb.
0	1,352	0	0	17,768	9,281	0	0	2,520	0	0	Mar.
5,949	1,309	303	0	81,107	9,042	0	0	2,439	268	0	April
8,237	1,352	411	0	88,938	9,344	0	0	2,520	377	0	May
9,875	1,309	470	0	93,787	7,960	0	0	2,439	464	0	June
10,266	1,352	512	0	91,195	5,103	0	0	2,520	527	0	July
10,266	1,352	432	0	88,148	2,631	0	0	2,520	482	0	Aug.
9,935	1,309	300	0	85,146	1,869	0	0	2,439	365	0	Sept.
0	1,352	214	0	82,342	1,770	0	0	2,520	272	0	Oct.
0	1,309	139	0	79,550	2,660	0	0	2,439	176	0	Nov.
0	1,352	0	0	76,935	2,470	0	0	2,520	0	0	Dec.
54,528	15,922	2,781	0		62,587	0	0	29,672	2,931	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1906											
Jan.	4,240	0	3,633	0	0	0	0	0	51,265	3,633	0
Feb.	3,960	607	3,960	0	0	0	0	0	50,520	3,960	0
Mar.	129,000	607	7,561	24,303	0	0	0	0	49,298	7,561	23,965
April	34,600	97,743	9,042	19,634	11,660	0	274	0	145,420	9,042	15,432
May	21,000	91,733	9,344	0	18,263	0	375	0	140,852	9,344	0
June	15,500	84,751	9,042	0	20,518	0	426	0	135,105	9,042	0
July	9,350	70,265	8,664	0	22,606	0	452	0	121,842	8,664	0
Aug.	4,490	47,893	4,490	0	24,086	0	329	0	100,040	4,490	0
Sept.	2,840	23,478	2,840	0	23,305	0	173	0	77,426	2,840	0
Oct.	2,450	0	2,450	0	0	0	0	0	55,759	2,450	0
Nov.	2,400	0	2,400	0	0	0	0	0	54,193	2,400	0
Dec.	11,600	0	4,030	0	0	0	0	0	52,745	4,030	0
Total or average	241,430		67,456	43,937	120,438	0	2,029	0		67,456	39,397
1907											
Jan.	58,400	7,570	9,217	50,881	0	0	0	0	58,963	9,217	51,921
Feb.	47,100	5,872	8,439	31,125	0	0	0	0	54,873	8,439	29,904
Mar.	116,000	13,408	9,344	47,166	0	0	0	0	62,408	9,344	45,814
April	58,400	72,898	9,042	0	11,708	0	238	0	121,898	9,042	0
May	21,500	110,310	9,344	0	21,989	0	426	0	160,351	9,344	0
June	15,100	100,051	9,042	0	24,242	0	478	0	151,129	9,042	0
July	8,360	81,389	7,920	0	27,072	0	493	0	133,496	7,920	0
Aug.	5,390	54,264	5,390	0	27,300	0	359	0	107,476	5,390	0
Sept.	3,580	26,605	3,580	0	26,421	0	184	0	81,011	3,580	0
Oct.	4,090	0	4,090	0	0	0	0	0	55,644	4,090	0
Nov.	3,800	0	3,800	0	0	0	0	0	54,078	3,800	0
Dec.	3,600	0	3,600	0	0	0	0	0	52,630	3,600	0
Total or average	345,320		82,808	129,172	138,732	0	2,178	0		82,808	127,639
1908											
Jan.	11,100	0	4,973	4,617	0	0	0	0	51,278	4,973	5,543
Feb.	15,000	1,510	8,741	5,141	0	0	0	0	50,510	8,741	4,616
Mar.	12,700	2,628	9,255	0	0	0	0	0	58,888	9,255	0
April	9,280	6,073	8,656	0	952	0	52	0	52,981	8,656	0
May	7,190	5,693	7,139	0	1,106	0	69	0	52,100	7,139	0
June	4,190	4,569	4,190	0	1,071	0	61	0	50,537	4,190	0
July	2,560	3,437	2,560	0	1,106	0	57	0	48,919	2,560	0
Aug.	2,210	2,274	2,210	0	1,106	0	36	0	47,208	2,210	0
Sept.	1,820	1,132	1,820	0	1,120	0	12	0	45,531	1,820	0
Oct.	2,070	0	2,070	0	0	0	0	0	43,970	2,070	0
Nov.	1,960	0	1,960	0	0	0	0	0	42,432	1,960	0
Dec.	2,870	0	2,870	0	0	0	0	0	41,000	2,870	0
Total or average	72,950		56,444	9,758	6,461	0	287	0		56,444	10,159

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1906
0	1,352	0	0	74,415	3,633	0	0	2,520	0	0	Jan.
0	1,222	0	0	72,502	3,960	0	0	2,276	0	0	Feb.
0	1,352	0	0	70,226	7,561	9,428	0	2,520	0	0	Mar.
13,028	1,309	357	0	179,717	9,042	0	6,365	2,439	444	0	April
15,553	1,352	498	0	196,027	9,344	0	11,680	2,520	636	0	May
17,843	1,309	569	0	192,847	9,042	0	14,159	2,439	755	0	June
20,527	1,352	609	0	181,952	8,664	0	16,782	2,520	857	0	July
20,774	1,352	488	0	162,479	4,490	0	17,151	2,520	734	0	Aug.
20,043	1,309	315	0	142,074	2,840	0	16,587	2,439	518	0	Sept.
0	1,352	214	0	122,530	2,450	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	2,400	0	0	2,439	235	0	Nov.
0	1,352	0	0	116,979	4,030	0	0	2,520	0	0	Dec.
107,768	15,922	3,189	0		67,456	9,428	82,724	29,672	4,536	0	Total or average
											1907
0	1,352	0	0	122,029	9,217	53,819	0	2,520	0	0	Jan.
0	1,222	0	0	114,873	8,439	28,878	0	2,276	0	0	Feb.
0	1,352	0	0	122,380	9,344	44,618	0	2,520	0	0	Mar.
9,221	1,309	375	0	181,898	9,042	290	6,475	2,439	446	0	April
19,487	1,352	539	0	221,606	9,344	0	16,826	2,520	698	0	May
21,773	1,309	609	0	213,718	9,042	0	19,251	2,439	815	0	June
24,466	1,352	642	0	197,271	7,920	0	21,922	2,520	906	0	July
24,651	1,352	462	0	172,363	5,390	0	22,149	2,520	766	0	Aug.
23,737	1,309	321	0	146,928	3,580	0	21,428	2,439	531	0	Sept.
0	1,352	214	0	122,530	4,090	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	3,800	0	0	2,439	236	0	Nov.
0	1,352	0	0	116,978	3,600	0	0	2,520	0	0	Dec.
123,335	15,922	3,301	0		82,808	127,605	108,051	29,672	4,755	0	Total or average
											1908
0	1,352	0	0	114,458	4,973	7,555	0	2,520	0	0	Jan.
0	1,265	0	0	110,510	8,741	4,224	0	2,358	0	0	Feb.
0	1,352	0	0	110,187	9,255	0	0	2,520	0	0	Mar.
0	1,309	196	0	111,112	8,656	0	0	2,439	317	0	April
0	1,352	262	0	108,980	7,139	0	0	2,520	420	0	May
0	1,309	309	0	106,091	4,190	0	0	2,439	494	0	June
0	1,352	359	0	103,158	2,560	0	0	2,520	573	0	July
0	1,352	325	0	100,065	2,210	0	0	2,520	524	0	Aug.
0	1,309	252	0	97,021	1,820	0	0	2,439	397	0	Sept.
0	1,352	186	0	94,185	2,070	0	0	2,520	297	0	Oct.
0	1,309	123	0	91,368	1,960	0	0	2,439	194	0	Nov.
0	1,352	0	0	88,735	2,870	0	0	2,520	0	0	Dec.
0	15,965	2,012	0		56,444	11,779	0	29,754	3,216	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1909											
Jan.	25,500	0	5,596	19,385	0	0	0	0	39,648	5,596	8,681
Feb.	59,400	519	8,440	42,858	0	0	0	0	49,519	8,440	41,897
Mar.	26,300	8,621	9,344	0	0	0	0	0	57,360	9,344	0
April	28,000	25,577	9,042	0	4,063	0	131	0	72,964	9,042	0
May	15,200	40,341	9,344	0	7,980	0	228	0	89,165	9,344	0
June	8,570	37,989	8,319	0	9,144	0	260	0	88,259	8,319	0
July	5,040	28,836	5,040	0	9,528	0	264	0	80,467	5,040	0
Aug.	3,120	19,044	3,120	0	9,528	0	196	0	71,998	3,120	0
Sept.	2,320	9,320	2,320	0	9,225	0	95	0	63,656	2,320	0
Oct.	2,310	0	2,310	0	0	0	0	0	55,687	2,310	0
Nov.	2,880	0	2,880	0	0	0	0	0	54,121	2,880	0
Dec.	20,900	0	6,346	0	0	0	0	0	52,673	6,346	1,682
Total or average	199,540		72,101	62,243	49,468	0	1,174	0		72,101	52,260
1910											
Jan.	69,500	14,554	9,344	73,583	0	0	0	0	64,193	9,344	72,870
Feb.	11,500	1,127	8,435	2,689	0	0	0	0	50,127	8,435	2,292
Mar.	9,590	1,503	9,029	0	0	0	0	0	49,678	9,029	0
April	8,270	2,064	8,120	0	321	0	22	0	48,887	8,120	0
May	5,050	1,871	5,050	0	363	0	29	0	47,542	5,050	0
June	3,560	1,479	3,560	0	352	0	14	0	45,940	3,560	0
July	2,450	1,113	2,450	0	363	0	16	0	44,340	2,450	0
Aug.	1,710	734	1,710	0	363	0	16	0	42,651	1,710	0
Sept.	1,370	355	1,370	0	355	0	0	0	40,992	1,370	0
Oct.	1,560	0	1,560	0	0	0	0	0	39,449	1,560	0
Nov.	1,870	0	1,870	0	0	0	0	0	37,923	1,870	0
Dec.	2,020	0	2,020	0	0	0	0	0	36,501	2,020	0
Total or average	118,450		54,518	76,272	2,117	0	97	0		54,518	75,162
1911											
Jan.	37,200	0	6,441	7,031	0	0	0	0	35,149	6,441	6,949
Feb.	44,300	23,728	8,440	53,874	0	0	0	0	57,607	8,440	38,010
Mar.	122,000	5,714	9,344	57,434	0	0	0	0	54,235	9,344	55,857
April	28,200	60,936	9,042	0	9,774	0	212	0	109,682	9,042	0
May	16,600	70,108	9,344	0	13,936	0	317	0	120,008	9,344	0
June	7,500	63,111	7,322	0	15,247	0	357	0	114,155	7,322	0
July	5,230	47,685	5,230	0	15,816	0	355	0	99,851	5,230	0
Aug.	3,610	31,514	3,610	0	15,816	0	260	0	84,807	3,610	0
Sept.	2,830	15,438	2,830	0	15,303	0	135	0	69,915	2,830	0
Oct.	3,140	0	3,140	0	0	0	0	0	55,688	3,140	0
Nov.	2,800	0	2,800	0	0	0	0	0	54,121	2,800	0
Dec.	2,870	0	2,870	0	0	0	0	0	52,673	2,870	0
Total or average	276,280		70,413	118,339	85,892	0	1,636	0		70,413	100,816

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1909
0	1,352	0	0	86,215	5,596	0	0	2,520	0	0	Jan.
0	1,222	0	0	103,599	8,440	35,296	0	2,276	0	0	Feb.
0	1,352	0	0	116,987	9,344	0	0	2,520	0	0	Mar.
1,190	1,309	258	0	131,423	9,042	0	0	2,439	375	0	April
5,041	1,352	369	0	147,567	9,344	0	1,955	2 520	520	0	May
6,306	1,309	428	0	148,428	8,319	0	3,318	2,439	629	0	June
6,639	1,352	478	0	142,293	5,040	0	3,515	2,520	720	0	July
6,578	1,352	412	0	135,538	3,120	0	3,515	2,520	646	0	Aug.
6,365	1,309	295	0	128,857	2,320	0	3,403	2,439	485	0	Sept.
0	1,352	214	0	122,530	2,310	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	2,880	0	0	2,439	236	0	Nov.
0	1,352	0	0	116,978	6,346	3,425	0	2,520	0	0	Dec.
32,119	15,922	2,593	0		72,101	38,721	15,706	29,672	3,968	0	Total or average
											1910
0	1,352	0	0	125,587	9,344	73,110	0	2,520	0	0	Jan.
0	1,222	0	0	110,113	8,435	1,945	0	2,276	0	0	Feb.
0	1,352	0	0	108,957	9,029	0	0	2,520	0	0	Mar.
0	1,309	186	0	106,998	8,120	0	0	2,439	307	0	April
0	1,352	250	0	104,402	5,050	0	0	2,520	407	0	May
0	1,309	291	0	101,475	3,560	0	0	2,439	478	0	June
0	1,352	337	0	98,558	2,450	0	0	2,520	555	0	July
0	1,352	307	0	95,483	1,710	0	0	2,520	506	0	Aug.
0	1,309	234	0	92,457	1,370	0	0	2,439	385	0	Sept.
0	1,352	174	0	89,633	1,560	0	0	2,520	288	0	Oct.
0	1,309	113	0	86,825	1,870	0	0	2,439	188	0	Nov.
0	1,352	0	0	84,198	2,020	0	0	2,520	0	0	Dec.
0	15,922	1,892	0		54,518	75,055	0	29,672	3,114	0	Total or average
											1911
0	1,352	0	0	81,678	6,441	0	0	2,520	0	0	Jan.
0	1,222	0	0	109,917	8,440	29,679	0	2,276	0	0	Feb.
0	1,352	0	0	113,822	9,344	55,275	0	2,520	0	0	Mar.
7,198	1,309	325	0	168,683	9,042	0	4,557	2,439	424	0	April
11,311	1,352	446	0	180,421	9,344	0	8,550	2,520	599	0	May
12,671	1,309	502	0	176,008	7,322	0	10,048	2,439	708	0	June
13,155	1,352	537	0	162,991	5,230	0	10,444	2,520	793	0	July
13,094	1,352	446	0	149,234	3,610	0	10,444	2,520	692	0	Aug.
12,612	1,309	306	0	135,578	2,830	0	10,109	2,439	500	0	Sept.
0	1,352	215	0	122,530	3,140	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	2,800	0	0	2,439	236	0	Nov.
0	1,352	0	0	116,978	2,870	0	0	2,520	0	0	Dec
70,041	15,922	2,916	0		70,413	84,954	54,152	29,672	4,309	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1912											
Jan.	2,710	0	2,710	0	0	0	0	0	51,321	2,710	0
Feb.	2,230	0	2,230	0	0	0	0	0	49,969	2,230	0
Mar.	22,900	0	8,199	0	0	0	0	0	48,704	8,199	0
April	18,000	14,701	8,515	0	2,314	0	95	0	62,053	8,515	0
May	10,900	21,777	8,828	0	4,273	0	163	0	69,991	8,828	0
June	4,990	19,413	4,990	0	4,634	0	182	0	69,228	4,990	0
July	3,060	14,597	3,060	0	4,790	0	184	0	65,940	3,060	0
Aug.	1,960	9,623	1,960	0	4,790	0	135	0	62,502	1,960	0
Sept.	1,550	4,698	1,550	0	4,634	0	64	0	59,131	1,550	0
Oct.	1,830	0	1,830	0	0	0	0	0	55,864	1,830	0
Nov.	1,730	0	1,730	0	0	0	0	0	54,297	1,730	0
Dec.	1,760	0	1,760	0	0	0	0	0	52,849	1,706	0
Total or average	73,620		47,362	0	25,435	0	823	0		47,362	0
1913											
Jan.	2,910	0	2,910	0	0	0	0	0	51,497	2,910	0
Feb.	13,200	0	4,753	0	0	0	0	0	50,145	4,753	0
Mar.	10,200	8,447	8,759	0	0	0	0	0	57,370	8,759	0
April	7,140	9,888	7,091	0	1,547	0	75	0	57,459	7,091	0
May	4,970	8,315	4,970	0	1,608	0	93	0	55,993	4,970	0
June	2,890	6,614	2,890	0	1,557	0	95	0	54,367	2,890	0
July	1,690	4,962	1,690	0	1,607	0	93	0	52,737	1,690	0
Aug.	1,070	3,262	1,070	0	1,607	0	68	0	51,010	1,070	0
Sept.	893	1,587	893	0	1,555	0	32	0	49,318	893	0
Oct.	910	0	910	0	0	0	0	0	47,749	910	0
Nov.	2,280	0	2,280	0	0	0	0	0	46,201	2,280	0
Dec.	2,170	0	2,170	0	0	0	0	0	44,765	2,170	0
Total or average	50,323		40,386	0	9,481	0	456	0		40,386	0
1914											
Jan.	61,400	0	6,271	41,989	0	0	0	0	43,413	6,271	35,050
Feb.	121,000	13,140	8,440	59,505	0	0	0	0	62,140	8,440	58,284
Mar.	48,000	66,195	9,344	53,083	0	0	0	0	115,194	9,344	52,388
April	21,400	51,768	9,042	0	8,291	0	193	0	100,110	9,042	0
May	16,900	55,642	9,344	0	11,077	0	274	0	105,206	9,344	0
June	9,580	51,847	8,585	0	12,509	0	313	0	102,701	8,585	0
July	5,570	40,020	5,570	0	13,258	0	317	0	92,040	5,570	0
Aug.	3,630	26,445	3,630	0	13,258	0	238	0	79,660	3,630	0
Sept.	2,730	12,949	2,730	0	12,826	0	123	0	67,426	2,730	0
Oct.	2,770	0	2,770	0	0	0	0	0	55,703	2,770	0
Nov.	2,440	0	2,440	0	0	0	0	0	54,137	2,440	0
Dec.	4,290	0	4,290	0	0	0	0	0	52,689	4,290	0
Total or average	299,710		72,456	154,577	71,219	0	1,458	0		72,456	145,722

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1912
0	1,352	0	0	114,458	2,710	0	0	2,520	0	0	Jan.
0	1,265	0	0	111,938	2,230	0	0	2,358	0	0	Feb.
0	1,352	0	0	109,580	8,199	0	0	2,520	0	0	Mar.
0	1,309	238	0	121,761	8,515	0	0	2,439	337	0	April
1,168	1,352	315	0	128,470	8,828	0	0	2,520	473	0	May
1,606	1,309	373	0	127,549	4,990	0	0	2,439	565	0	June
1,660	1,352	426	0	124,545	3,060	0	0	2,520	656	0	July
1,660	1,352	359	0	121,369	1,960	0	0	2,520	602	0	Aug.
1,667	1,309	291	0	118,247	1,550	0	0	2,439	456	0	Sept.
0	1,352	215	0	115,352	1,830	0	0	2,520	343	0	Oct.
0	1,309	139	0	112,489	1,730	0	0	2,439	226	0	Nov.
0	1,352	0	0	109,824	1,760	0	0	2,520	0	0	Dec.
7,761	15,965	2,356	0		47,362	0	0	29,754	3,658	0	Total or average
											1913
0	1,352	0	0	107,304	2,910	0	0	2,520	0	0	Jan.
0	1,222	0	0	104,784	4,753	0	0	2,276	0	0	Feb.
0	1,352	0	0	110,955	8,759	0	0	2,520	0	0	Mar.
0	1,309	206	0	109,876	7,091	0	0	2,439	315	0	April
0	1,352	274	0	107,171	4,970	0	0	2,520	420	0	May
0	1,309	321	0	104,231	2,890	0	0	2,439	493	0	June
0	1,352	375	0	101,299	1,690	0	0	2,520	573	0	July
0	1 352	340	0	98,206	1,070	0	0	2,520	523	0	Aug.
0	1 309	260	0	95,163	893	0	0	2,439	394	0	Sept.
0	1 352	196	0	92,330	910	0	0	2,520	297	0	Oct.
0	1,309	127	0	89,513	2,280	0	0	2,439	194	0	Nov.
0	1,352	0	0	86,880	2,170	0	0	2,520	0	0	Dec.
0	15,922	2,099	0		40,386	0	0	23,672	3,209	0	Total or average
											1914
0	1,352	0	0	84,360	6,271	20,557	0	2,520	0	0	Jan.
0	1,222	0	0	116,412	8,440	51,500	0	2,276	0	0	Feb.
0	1,352	0	0	175,196	9,344	51,782	0	2,520	0	0	Mar.
5,652	1,309	301	0	159,550	9,042	0	3,070	2,439	407	0	April
8,299	1,352	410	0	165,992	9,344	0	5,656	2,520	565	0	May
9,875	1,309	472	0	164,807	8,585	0	7,317	2,439	676	0	June
10,512	1,352	516	0	155,370	5,570	0	7,893	2,520	765	0	July
10,450	1,352	432	0	144,192	3,630	0	7,892	2,520	676	0	Aug.
10,113	1,309	301	0	133,104	2 730	0	7,639	2,439	496	0	Sept.
0	1,352	214	0	122,530	2,770	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	2,440	0	0	2,439	236	0	Nov.
0	1,352	0	0	116,978	4,290	0	0	2,520	0	0	Dec.
54,901	15,922	2,785	0		72.456	123,839	39,467	29,672	4,178	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1915											
Jan.	7,380	0	4,428	2,632	0	0	0	0	51,337	4,428	3,629
Feb.	30,200	320	8,412	13,196	0	0	0	0	49,308	8,412	12,355
Mar.	21,500	8,912	9,344	0	0	0	0	0	57,519	9,344	0
April	17,300	21,068	9,042	0	3,339	0	117	0	68,323	9,042	0
May	20,400	25,870	9,344	0	4,256	0	177	0	74,618	9,344	0
June	11,400	32,493	8,967	0	7,807	0	238	0	81,891	8,967	0
July	7,010	26,881	7,010	0	8,875	0	254	0	77,842	7,010	0
Aug.	3,980	17,752	3,980	0	8,875	0	190	0	70,305	3,980	0
Sept.	3,270	8,687	3,270	0	8,592	0	95	0	62,829	3,270	0
Oct.	2,770	0	2,770	0	0	0	0	0	55,694	2,770	0
Nov.	3,010	0	3,010	0	0	0	0	0	54,128	3,010	0
Dec.	3,580	0	3,580	0	9	0	0	0	52,680	3,580	0
Total or average	131,800		73,157	15,828	41,744	0	1,071	0		73,157	15,984
1916											
Jan.	148,000	0	8,759	52,702	0	0	0	0	51,328	8,759	51,935
Feb.	39,400	86,539	8,741	99,427	0	0	0	0	137,282	8,741	99,779
Mar.	34,800	17,771	9,344	18	0	0	0	0	66,897	9,344	603
April	19,900	43,209	9,042	0	6,913	0	174	0	90,398	9,042	0
May	10,400	46,980	9,130	0	9,304	0	248	0	95,618	9,130	0
June	5,830	38,698	5,830	0	9,314	0	264	0	88,764	5,830	0
July	4,770	29,120	4,770	0	9,624	0	264	0	80,541	4,770	0
Aug.	3,570	19,232	3,570	0	9,624	0	198	0	72,070	3,570	0
Sept.	2,810	9,410	2,810	0	9,314	0	96	0	63,667	2,810	0
Oct.	7,010	0	6,473	0	0	0	0	0	55,638	6,473	0
Nov.	4,130	537	4,130	0	0	0	7	0	54,609	4,130	0
Dec.	13,600	530	5,253	0	0	0	0	0	53,169	5,253	0
Total or average	294,220		77,852	152,147	54,093	0	1,251	0		77,852	152,317
1917											
Jan.	9,280	8,877	8,172	2,467	0	0	0	0	60,164	8,172	10,464
Feb.	13,200	518	7,551	0	0	0	0	0	49,456	7,551	0
Mar.	13,600	6,167	9,344	0	0	0	0	0	53,883	9,344	0
April	10,500	10,423	9,042	0	1,640	0	73	0	56,787	9,042	0
May	8,610	10,168	8,531	0	1,979	0	99	0	56,728	8,531	0
June	5,270	8,169	5,270	0	1,935	0	105	0	55,179	5,270	0
July	3,140	6,129	3,140	0	1,999	0	99	0	53,543	3,140	0
Aug.	2,200	4,031	2,200	0	1,999	0	67	0	51,812	2,200	0
Sept.	1,510	1,965	1,510	0	1,935	0	30	0	50,115	1,510	0
Oct.	1,560	0	1,560	0	0	0	0	0	48,544	1,560	0
Nov.	1,840	0	1,840	0	0	0	0	0	46,994	1,840	0
Dec.	2,000	0	2,000	0	0	0	0	0	45,558	2,000	0
Total or average	72,710		60,160	9,467	11,487	0	473	0		60,160	10,464

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1915
0	1,352	0	0	114,458	4,428	5,570	0	2,520	0	0	Jan.
0	1,222	0	0	109,320	8,412	11,720	0	2,276	0	0	Feb.
0	1,352	0	0	117,112	9,344	0	0	2,520	0	0	Mar.
416	1,309	238	0	126,748	9,042	0	0	2,439	353	0	April
2,090	1,352	341	0	132,214	9,344	0	0	2,520	494	0	May
4,759	1,309	414	0	140,256	8,967	0	1,326	2,439	603	0	June
5,717	1,352	468	0	138,321	7,010	0	2,189	2,520	706	0	July
5,717	1,352	407	0	132,906	3,980	0	2,188	2,520	640	0	Aug.
5,533	1,309	293	0	127,558	3,270	0	2,109	2,439	480	0	Sept
0	1,352	214	0	122,530	2,770	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	3,010	0	0	2,439	236	0	Nov
0	1,352	0	0	116,978	3,580	0	0	2,520	0	0	Dec.
24,232	15,922	2,514	0		73,157	17,290	7,812	29,672	3,869	0	Total or average
											1916
0	1,352	0	0	114,458	8,759	51,481	0	2,520	0	0	Jan.
0	1,265	0	0	199,698	8,741	99,327	0	2,358	0	0	Feb.
0	1,352	0	0	128,672	9,344	2,340	0	2,520	0	0	Mar.
4,045	1,309	284	0	149,268	9,042	0	1,398	2,439	389	0	April
6,393	1,352	379	0	155,900	9,130	0	3,620	2,520	541	0	May
6,484	1,309	430	0	150,483	5,830	0	3,819	2,439	633	0	June
6,639	1,352	480	0	143,592	4,770	0	3,946	2,520	724	0	July
6,639	1,352	412	0	136,402	3,570	0	3,945	2,520	650	0	Aug.
6,425	1,309	295	0	129,287	2,810	0	3,832	2,439	486	0	Sept.
0	1,352	214	0	122,530	6,473	0	0	2,520	357	0	Oct.
0	1,309	131	0	120,190	4,130	0	0	2,439	236	0	Nov.
0	1,352	0	0	117,515	5,253	141	0	2,520	0	0	Dec.
36,625	15,965	2,625	0		77,852	153,289	20,566	29,754	4,016	0	Total or average
											1917
0	1,352	0	0	123,201	8,172	12,270	0	2,520	0	0	Jan.
0	1,222	0	0	109,519	7,551	0	0	2,276	0	0	Feb.
0	1,352	0	0	112,892	9,344	0	0	2,520	0	0	Mar.
0	1,309	208	0	114,628	9,042	0	0	2,439	325	0	April
0	1,352	276	0	113,322	8,531	0	0	2,520	432	0	May
0	1,309	327	0	110,449	5,270	0	0	2,439	508	0	June
0	1,352	379	0	107,502	3,140	0	0	2,520	589	0	July
0	1,352	345	0	104,393	2,200	0	0	2,520	539	0	Aug.
0	1,309	262	0	101,334	1,510	0	0	2,439	408	0	Sept.
0	1,352	198	0	98,487	1,560	0	0	2,520	305	0	Oct.
0	1,309	127	0	95,662	1,840	0	0	2,439	202	0	Nov.
0	1,352	0	0	93,021	2,000	0	0	2,520	0	0	Dec.
0	15,922	2,122	0		60,160	12,270	0	29,672	3,308	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1918											
Jan.	2,020	0	2,020	0	0	0	0	0	44,206	2,020	0
Feb.	9,330	0	3,847	0	0	0	0	0	42,854	3,847	0
Mar.	73,200	5,483	9,249	11,341	0	0	0	0	47,115	9,249	3,595
April	17,000	58,093	9,042	0	9,314	0	206	0	106,119	9,042	0
May	10,000	56,531	8,993	0	11,216	0	276	0	105,858	8,993	0
June	6,010	46,046	6,010	0	11,097	0	292	0	96,679	6,010	0
July	3,970	34,657	3,970	0	11,467	0	293	0	86,528	3,970	0
Aug.	2,840	22,897	2,840	0	11,467	0	218	0	76,012	2,840	0
Sept.	2,330	11,212	2,330	0	11,099	0	113	0	65,632	2,330	0
Oct.	2,930	0	2,930	0	0	0	0	0	55,697	2,930	0
Nov.	3,140	0	3,140	0	0	0	0	0	54,131	3,140	0
Dec.	4,370	0	4,370	0	0	0	0	0	52,683	4,370	0
Total or average	137,140		58,741	11,341	65,660	0	1,398	0		58,741	3,595
1919											
Jan.	3,300	0	3,300	0	0	0	0	0	51,331	3,300	0
Feb.	4,110	0	4,110	0	0	0	0	0	49,979	4,110	0
Mar.	6,110	0	6,110	0	0	0	0	0	48,757	6,110	0
April	6,010	0	6,010	0	0	0	0	0	47,405	6,010	0
May	3,810	0	3,810	0	0	0	0	0	45,914	3,810	0
June	1,890	0	1,890	0	0	0	0	0	44,318	1,890	0
July	1,320	0	1,320	0	0	0	0	0	42,725	1,320	0
Aug.	935	0	935	0	0	0	0	0	41,044	935	0
Sept.	1,010	0	1,010	0	0	0	0	0	39,393	1,010	0
Oct.	2,040	0	2,040	0	0	0	0	0	37,854	2,040	0
Nov.	2,130	0	2,130	0	0	0	0	0	36,331	2,130	0
Dec.	5,340	0	5,209	0	0	0	0	0	34,913	5,209	0
Total or average	38,005		37,874	0	0	0	0	0		37,874	0
1920											
Jan.	3,260	131	3,260	0	0	0	0	0	33,692	3,260	0
Feb.	12,700	131	5,854	0	0	0	0	0	32,340	5,854	0
Mar.	36,200	6,977	9,344	0	0	0	0	0	37,921	9,344	0
April	25,100	33,833	9,042	0	5,389	0	153	0	63,425	9,042	0
May	12,600	44,349	9,344	0	8,776	0	240	0	77,938	9,344	0
June	7,380	38,589	7,349	0	9,286	0	264	0	76,737	7,349	0
July	4,670	29,070	4,670	0	9,603	0	270	0	71,554	4,670	0
Aug.	3,200	19,197	3,200	0	9,603	0	200	0	66,191	3,200	0
Sept.	2,030	9,394	2,030	0	9,292	0	102	0	60,817	2,030	0
Oct.	2,000	0	2,000	0	0	0	0	0	55,708	2,000	0
Nov.	2,380	0	2,380	0	0	0	0	0	54,142	2,380	0
Dec.	2,210	0	2,210	0	0	0	0	0	52,694	2,210	0
Total or average	113,730		60,683	0	51,949	0	1,229	0		60,683	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

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mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1918
0	1,352	0	0	90,501	2,020	0	0	2,520	0	0	Jan.
0	1,222	0	0	87,981	3,847	0	0	2,276	0	0	Feb.
0	1,352	0	0	91,188	9,249	0	0	2,520	0	0	Mar.
6,603	1,309	307	0	152,619	9,042	0	1,981	2,439	395	0	April
8,422	1,352	412	0	155,762	8,993	0	3,603	2,520	541	0	May
8,388	1,309	454	0	150,105	6,010	0	3,729	2,439	633	0	June
8,668	1,352	496	0	143,304	3,970	0	3,854	2,520	724	0	July
8,606	1,352	422	0	136,206	2,840	0	3,854	2,520	650	0	Aug.
8,329	1,309	297	0	129,182	2,330	0	3,727	2,439	486	0	Sept.
0	1,352	214	0	122,530	2,930	0	0	2,520	357	0	Oct.
0	1,309	139	0	119,653	3,140	0	0	2,439	236	0	Nov.
0	1,352	0	0	116,978	4,370	0	0	2,520	0	0	Dec.
49,016	15,922	2,741	0		58,741	0	20,748	29,072	4,022	0	Total or average
											1919
0	1,352	0	0	114,458	3,300	0	0	2,520	0	0	Jan.
0	1,222	0	0	111,938	4,110	0	0	2,276	0	0	Feb.
0	1,352	0	0	109,662	6,110	0	0	2,520	0	0	Mar.
0	1,309	182	0	107,142	6,010	0	0	2,439	310	0	April
0	1,352	244	0	104,393	3,810	0	0	2,520	412	0	May
0	1,309	284	0	101,461	1,890	0	0	2,439	485	0	June
0	1,352	329	0	98,537	1,320	0	0	2,520	561	0	July
0	1,352	299	0	95,456	935	0	0	2,520	514	0	Aug.
0	1,309	230	0	92,422	1,010	0	0	2,439	387	0	Sept.
0	1,352	171	0	89,596	2,040	0	0	2,520	291	0	Oct.
0	1,309	109	0	86,785	2,130	0	0	2,439	190	0	Nov.
0	1,352	0	0	84,156	5,209	0	0	2,520	0	0	Dec.
0	15,922	1,848	0		37,874	0	0	29,672	3,150	0	Total or average
											1920
0	1,352	0	0	81,767	3,260	0	0	2,520	0	0	Jan.
0	1,265	0	0	79,247	5,854	0	0	2,358	0	0	Feb.
0	1,352	0	0	83,735	9,344	0	0	2,520	0	0	Mar.
0	1,309	236	0	108,071	9,042	0	0	2,439	311	0	April
2,766	1,352	339	0	121,379	9,344	0	0	2,520	462	0	May
3,510	1,309	395	0	121,653	7,349	0	0	2,439	547	0	June
3,565	1,352	446	0	118,698	4,670	0	0	2,520	635	0	July
3,627	1,352	395	0	115,543	3,200	0	0	2,520	581	0	Aug.
3,510	1,309	290	0	112,442	2,030	0	0	2,439	442	0	Sept.
0	1,352	214	0	109,561	2,000	0	0	2,520	331	0	Oct.
0	1,309	139	0	106,710	2,380	0	0	2,439	218	0	Nov.
0	1,352	0	0	104,053	2,210	0	0	2,520	0	0	Dec.
16,978	15,965	2,454	0		60,683	0	0	29,754	3,527	0	Total or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1921											
Jan.	5,160	0	4,405	0	0	0	0	0	51,342	4,405	0
Feb.	4,490	755	4,490	0	0	0	0	0	50,745	4,490	0
Mar.	15,400	755	7,288	0	0	0	0	0	49,523	7,288	0
April	6,070	8,867	6,070	0	1,386	0	67	0	56,283	6,070	0
May	15,700	7,414	6,835	0	1,432	0	85	0	54,770	6,835	0
June	8,980	14,762	7,920	0	3,510	0	155	0	62,002	7,920	0
July	3,830	12,157	3,830	0	3,978	0	169	0	61,399	3,830	0
Aug.	2,450	8,010	2,450	0	3,978	0	121	0	59,450	2,450	0
Sept.	1,840	3,911	1,840	0	3,859	0	52	0	57,536	1,840	0
Oct.	2,040	0	2,040	0	0	0	0	0	55,703	2,040	0
Nov.	1,800	0	1,800	0	0	0	0	0	54,137	1,800	0
Dec.	119,000	0	5,045	38,907	0	0	0	0	52,689	5,045	39,506
Total or average	186,760		54,013	38,907	18,143	0	649	0		54,013	39,506
1922											
Jan.	62,100	75,048	9,344	108,425	0	0	0	0	125,786	9,344	107,332
Feb.	88,900	19,379	8,440	83,060	0	0	0	0	69,858	8,440	83,316
Mar.	47,800	16,779	9,344	3,196	0	0	0	0	65,780	9,344	2,882
April	31,400	52,039	9,042	0	8,334	0	192	0	100,002	9,042	0
May	24,700	65,871	9,344	0	13,084	0	303	0	115,088	9,344	0
June	14,400	67,840	9,042	0	16,400	0	373	0	118,319	9,042	0
July	9,100	56,425	8,576	0	18,735	0	392	0	108,104	8,576	0
Aug.	5,080	37,822	5,080	0	18,997	0	287	0	90,789	5,080	0
Sept.	3,290	18,538	3,290	0	18,385	0	153	0	72,867	3,290	0
Oct.	3,110	0	3,110	0	0	0	0	0	55,724	3,110	0
Nov.	5,310	0	4,519	0	0	0	0	0	54,158	4,519	0
Dec.	21,500	791	8,456	0	0	0	0	0	53,499	8,456	1,990
Total or average	316,690		87,587	194,681	93,935	0	1,700	0		87,587	195,520
1923											
Jan.	7,130	13,835	6,968	13,042	0	0	0	0	63,201	6,968	12,056
Feb.	7,830	955	7,791	0	0	0	0	0	49,955	7,791	0
Mar.	7,320	994	7,320	0	0	0	0	0	48,772	7,320	0
April	8,330	994	8,079	0	157	0	8	0	47,420	8,079	0
May	5,480	1,080	5,480	0	210	0	12	0	46,180	5,480	0
June	3,700	858	3,700	0	204	0	12	0	44,584	3,700	0
July	2,420	642	2,420	0	212	0	8	0	42,987	2,420	0
Aug.	1,990	422	1,990	0	212	0	6	0	41,304	1,990	0
Sept.	1,750	204	1,750	0	204	0	0	0	39,653	1,750	0
Oct.	1,710	0	1,710	0	0	0	0	0	38,112	1,710	0
Nov.	1,960	0	1,960	0	0	0	0	0	36,589	1,960	0
Dec.	2,130	0	2,130	0	0	0	0	0	35,169	2,130	0
Total or average	51,750		51,298	13,042	1,199	0	46	0		51,298	12,056

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

tions Carried Out on a Daily Basis.

mary, see Table 13, page 160.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

onal storage each year.

feet capacity				240,000 acre-feet capacity							
Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
											1921
0	1,352	0	0	101,533	4,405	0	0	2,520	0	0	Jan.
0	1,222	0	0	99,768	4,490	0	0	2,276	0	0	Feb.
0	1,352	0	0	97,492	7,288	0	0	2,520	0	0	Mar.
0	1,309	204	0	103,084	6,070	0	0	2,439	301	0	April
0	1,352	281	0	100,344	6,835	0	0	2,520	403	0	May
0	1,309	354	0	106,286	7,920	0	0	2,439	500	0	June
184	1,352	413	0	104,407	3,830	0	0	2,520	583	0	July
184	1,352	378	0	101,304	2,450	0	0	2,520	533	0	Aug.
238	1,309	286	0	98,251	1,840	0	0	2,439	404	0	Sept.
0	1,352	214	0	95,408	2,040	0	0	2,520	303	0	Oct.
0	1,309	139	0	92,585	1,800	0	0	2,439	198	0	Nov.
0	1,352	0	0	89,948	5,045	20,952	0	2,520	0	0	Dec.
606	15,922	2,269	0		54,013	20,952	0	29,672	3,225	0	Total or average
											1922
0	1,352	0	0	180,431	9,344	103,406	0	2,520	0	0	Jan.
0	1,222	0	0	127,261	8,440	79,666	0	2,276	0	0	Feb.
0	1,352	0	0	125,779	9,344	2,562	0	2,520	0	0	Mar.
5,652	1,309	311	0	159,153	9,042	0	2,974	2,439	406	0	April
10,327	1,352	446	0	175,692	9,344	0	7,605	2,520	589	0	May
13,742	1,309	522	0	180,334	9,042	0	11,108	2,439	720	0	June
15,922	1,352	565	0	171,425	8,576	0	13,268	2,520	821	0	July
16,106	1,352	464	0	155,340	5,080	0	13,533	2,520	712	0	Aug.
15,527	1,309	307	0	138,575	3,290	0	13,098	2,439	508	0	Sept.
0	1,352	214	0	122,530	3,110	0	0	2,520	357	0	Oct.
0	1,309	141	0	119,653	4,519	0	0	2,439	236	0	Nov.
0	1,352	0	0	117,769	8,456	5,092	0	2,520	0	0	Dec.
77,276	15,922	2,970	0		87,587	190,726	61,586	29,672	4,349	0	Total or average
											1923
0	1,352	0	0	123,201	6,968	10,928	0	2,520	0	0	Jan.
0	1,222	0	0	109,915	7,791	0	0	2,276	0	0	Feb.
0	1,352	0	0	107,678	7,320	0	0	2,520	0	0	Mar.
0	1,309	182	0	105,158	8,079	0	0	2,439	305	0	April
0	1,352	244	0	102,665	5,480	0	0	2,520	403	0	May
0	1,309	288	0	99,742	3,700	0	0	2,439	474	0	June
0	1,352	331	0	96,829	2,420	0	0	2,520	549	0	July
0	1,352	299	0	93,760	1,990	0	0	2,520	500	0	Aug.
0	1,309	232	0	90,740	1,750	0	0	2,439	379	0	Sept.
0	1,352	171	0	87,922	1,710	0	0	2,520	288	0	Oct.
0	1,309	111	0	85,114	1,960	0	0	2,439	186	0	Nov.
0	1,352	0	0	82,489	2,130	0	0	2,520	0	0	Dec.
0	15,922	1,858	0		51,298	10,928	0	29,672	3,084	0	Tota or average

TABLE 13a (Continued). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1924											
Jan.	2,170	0	2,170	0	0	0	0	0	33,817	2,170	0
Feb.	1,790	0	1,790	0	0	0	0	0	32,465	1,790	0
Mar.	4,130	0	3,714	0	0	0	0	0	31,200	3,714	0
April	6,190	416	6,190	0	59	0	8	0	30,264	6,190	0
May	3,650	349	3,650	0	61	0	10	0	28,814	3,650	0
June	1,660	278	1,660	0	59	0	10	0	27,276	1,660	0
July	1,000	209	1,000	0	61	0	12	0	25,753	1,000	0
Aug.	756	136	756	0	61	0	10	0	24,153	756	0
Sept.	744	65	744	0	59	0	6	0	22,579	744	0
Oct.	873	0	873	0	0	0	0	0	21,103	873	0
Nov.	1,190	0	1,190	0	0	0	0	0	19,628	1,190	0
Dec.	1,780	0	1,780	0	0	0	0	0	18,240	1,780	0
Total or average	25,933		25,517	0	360	0	56	0		25,517	0
1925											
Jan.	1,710	0	1,710	0	0	0	0	0	16,888	1,710	0
Feb.	1,620	0	1,620	0	0	0	0	0	15,536	1,620	0
Mar.	2,510	0	2,423	0	0	0	0	0	14,314	2,423	0
April	7,200	87	5,765	0	0	0	4	0	13,049	5,765	0
May	3,050	1,518	3,050	0	285	0	29	0	13,086	3,050	0
June	1,840	1,204	1,840	0	278	0	28	0	11,629	1,840	0
July	824	898	824	0	285	0	24	0	10,189	824	0
Aug.	621	589	621	0	285	0	16	0	8,696	621	0
Sept.	492	288	492	0	278	0	10	0	7,227	492	0
Oct.	873	0	873	0	0	0	0	0	5,837	873	0
Nov.	1,010	0	1,010	0	0	0	0	0	4,433	1,010	0
Dec.	1,650	0	1,650	0	0	0	0	0	3,096	1,650	0
Total or average	23,400		21,878	0	1,411	0	111	0		21,878	0

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.
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											1924
0	1,352	0	0	79,969	2,170	0	0	2,520	0	0	Jan.
0	1,265	0	0	77,449	1,790	0	0	2,358	0	0	Feb.
0	1,352	0	0	75,091	3,714	0	0	2,520	0	0	Mar.
0	1,309	141	0	72,987	6,190	0	0	2,439	238	0	April
0	1,352	186	0	70,310	3,650	0	0	2,520	315	0	May
0	1,309	214	0	67,475	1,660	0	0	2,439	369	0	June
0	1,352	248	0	64,667	1,000	0	0	2,520	426	0	July
0	1,352	222	0	61,721	756	0	0	2,520	385	0	Aug.
0	1,309	167	0	58,816	744	0	0	2,439	290	0	Sept.
0	1,352	123	0	56,087	873	0	0	2,520	214	0	Oct.
0	1,309	79	0	53,353	1,190	0	0	2,439	139	0	Nov.
0	1,352	0	0	50,775	1,780	0	0	2,520	0	0	Dec.
0	15,965	1,380	0		25,517	0	0	29,754	2,376	0	Total or average
											1925
0	1,352	0	0	48,255	1,710	0	0	2,520	0	0	Jan.
0	1,222	0	0	45,735	1,620	0	0	2,276	0	0	Feb.
0	1,352	0	0	43,459	2,423	0	0	2,520	0	0	Mar.
0	1,309	89	0	41,026	5,765	0	0	2,439	171	0	April
0	1,352	105	0	39,851	3,050	0	0	2,520	222	0	May
0	1,309	131	0	37,109	1,840	0	0	2,439	254	0	June
0	1,352	141	0	34,416	824	0	0	2,520	288	0	July
0	1,352	117	0	31,608	621	0	0	2,520	256	0	Aug.
0	1,309	81	0	28,832	492	0	0	2,439	188	0	Sept.
0	1,352	52	0	26,205	873	0	0	2,520	137	0	Oct.
0	1,309	28	0	23,548	1,010	0	0	2,439	85	0	Nov.
0	1,352	0	0	21,024	1,650	0	0	2,520	0	0	Dec.
0	15,922	744	0		21,878	0	0	29,672	1,601	0	Total or average

TABLE 13a (Concluded). SAN GABRIEL

WATER YIELD UNDER

FLOOD CONTROL, SEASONAL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Reservoir emptied of seas

Year and month	Run-off at Azusa in acre-feet	Maximum flood control reserve or first 131,000 acre-feet of capacity							180,000 acre-		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Seasonally stored water in acre-feet	Yield in a uniformly continuous supply from over-year storage in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights (first 152 second-feet of natural flow) in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1926											
Jan.	1,540	0	1,540	0	0	0	0	0	1,744	1,540	0
Feb.	7,940	0	5,485	0	0	0	0	0	392	5,485	0
Mar.	3,650	2,455	3,650	0	0	0	0	0	1,625	3,650	0
April	69,000	2,455	8,233	0	383	0	32	0	273	8,233	0
May	13,000	62,807	9,142	0	12,471	0	294	0	59,572	9,142	0
June	5,500	53,900	5,500	0	13,006	0	323	0	61,785	5,500	0
July	3,120	40,571	3,120	0	13,441	0	321	0	60,127	3,120	0
Aug.	2,070	26,809	2,070	0	13,441	0	239	0	58,367	2,070	0
Sept.	1,580	13,129	1,580	0	13,001	0	128	0	56,642	1,580	0
Oct.	0							0	55,049		0
Nov.											
Dec.											
Total or average	107,400		40,320	0	65,743	0	1,337	0		40,320	0
Total for period, Jan. 1, 1897, to Oct. 1, 1926	**3,731,977**		**1,513,303**	**1,103,359**	**1,091,252**	**0**	**24,063**	**0**		**1,513,303**	**[a]1,010,662**
Average for period, Jan. 1, 1897, to Oct. 1, 1926	**125,445**		**50,867**	**37,088**	**36,681**	**0**	**809**	**0**		**50,867**	**[a]33,972**

[a] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations, this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

RESERVOIR ON SAN GABRIEL RIVER.

"COORDINATED PLAN."

OVER-YEAR STORAGE COORDINATED.

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											1926
0	1,352	0	0	18,504	1,540	0	0	2,520	0	0	Jan.
0	1,222	0	0	15,984	5,485	0	0	2,276	0	0	Feb.
0	1,352	0	0	16,163	3,650	0	0	2,520	0	0	Mar.
0	1,309	159	0	13,643	8,233	0	0	2,439	196	0	April
0	1,352	293	0	71,775	9,142	0	0	2,520	325	0	May
0	1,309	349	0	72,788	5,500	0	0	2,439	385	0	June
0	1,352	408	0	69,964	3,120	0	0	2,520	442	0	July
0	1,352	373	0	67,002	2,070	0	0	2,520	403	0	Aug.
0	1,309	284	0	64,079	1,580	0	0	2,439	303	0	Sept.
0				61,337		0	0			0	Oct.
											Nov.
											Dec.
0	11,909	1,866	0		40,320	0	0	22,193	2,054	0	Total or average
676,322	**473,905**	**65,386**	**0**		**1,513,303**	**891,925**	**410,812**	**883,173**	**94,077**	**0**	**Total for period, Jan. 1, 1897, to Oct. 1, 1926**
22,734	**15,930**	**2,198**	**0**		**50,867**	**[b]29,981**	**[b]13,809**	**[b]29,686**	**3,162**	**0**	**Average for period, Jan. 1, 1897, to Oct. 1, 1926**

[b] These figures contain 61,313 acre-feet total or an average of 2060 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. A supplementary analysis, having the same amount of water in storage at the beginning and at the end of the period, was made to obtain the exact yield for the period. This gave 22,200, 25,900 and 23,300 acre-feet per season, respectively, for the flood control water seasonally stored water, and uniformly continuous flow instead of 29,981, 13,809, and 29,686 acre-feet, respectively, that are shown herein.

TABLE 15a. SAN GABRIEL RESER

COMPARISON OF WATER YIELD FOR COORDINATED WITH SEASONAL

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1897								
Jan.	3,617	62,650	3,617	11,779	1,352	0	0	0
Feb.	19,146	49,519	7,262	4,628	1,222	0	0	0
Mar.	28,623	55,553	9,344	0	1,352	0	0	0
April	17,519	73,480	9,042	0	1,309	1,249	234	0
May	8,851	79,165	8,126	0	1,352	3,012	343	0
June	4,033	75,183	4,033	0	1,309	3,093	396	0
July	2,343	70,385	2,343	0	1,352	3,197	447	0
Aug.	1,613	65,389	1,613	0	1,352	3,197	393	0
Sept.	1,226	60,447	1,226	0	1,309	3,153	290	0
Oct.	5,564	55,695	2,622	0	1,352	0	220	0
Nov.	1,860	57,035	1,860	0	1,309	0	143	0
Dec.	1,875	55,613	1,875	0	1,352	0	0	0
Total or average	96,270		52,963	16,407	15,922	16,901	2,466	0
1898								
Jan.	2,453	54,261	2,453	0	1,352	0	0	0
Feb.	2,241	52,909	2,241	0	1,222	0	0	0
Mar.	2,131	51,687	2,131	0	1,352	0	0	0
April	1,950	50,335	1,950	0	1,309	0	190	0
May	2,213	48,836	2,213	0	1,352	0	252	0
June	1,159	47,232	1,159	0	1,309	0	296	0
July	672	45,627	672	0	1,352	0	343	0
Aug.	456	43,932	456	0	1,352	0	313	0
Sept.	467	42,267	467	0	1,309	0	238	0
Oct.	533	40,720	533	0	1,352	0	179	0
Nov.	580	39,189	580	0	1,309	0	115	0
Dec.	832	37,765	832	0	1,352	0	0	0
Total or average	15,687		15,687	0	15,922	0	1,926	
1899								
Jan.	1,414	36,413	1,414	0	1,352	0	0	0
Feb.	1,244	35,061	1,244	0	1,222	0	0	0
Mar.	1,623	33,839	1,623	0	1,352	0	0	0
April	1,262	32,487	1,262	0	1,309	0	149	0
May	842	31,029	842	0	1,352	0	194	0
June	565	29,483	565	0	1,309	0	224	0
July	221	27,950	221	0	1,352	0	260	0
Aug.	295	26,338	295	0	1,352	0	234	0
Sept	220	24,752	220	0	1,309	0	175	0
Oct.	683	23,268	683	0	1,352	0	129	0
Nov.	847	21,787	847	0	1,309	0	83	0
Dec.	1,247	20,395	1,247	0	1,352	0	0	0
Total or average	10,463		10,463	0	15,922	0	1,448	0

VOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL
AND OVER-YEAR STORAGE.
tions Carried out on a Daily Basis.
mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1897
49,122	3,617	0	1,107	0	0	0	Jan.
48,015	7,262	9,778	999	0	0	0	Feb.
49,122	9,344	18,172	1,107	0	0	0	Mar.
49,122	9,042	5,983	1,071	0	188	0	April
50,357	8,126	0	1,107	0	260	0	May
49,715	4,033	0	1,071	0	305	0	June
48,339	2,343	0	1,107	0	357	0	July
46,875	1,613	0	1,107	0	329	0	Aug.
45,439	1,226	0	1,071	0	250	0	Sept.
44,118	2,622	0	1,107	0	190	0	Oct.
45,763	1,860	0	1,071	0	127	0	Nov.
44,565	1,875	0	1,107	0	0	0	Dec.
	52,963	33,933	13,032	0	2,006	0	Total or average
							1898
43,458	2,453	0	1,107	0	0	0	Jan.
42,351	2,241	0	999	0	0	0	Feb.
41,352	2,131	0	1,107	0	0	0	Mar.
40,245	1,950	0	1,071	0	165	0	April
39,000	2,213	0	1,107	0	222	0	May
37,680	1,159	0	1,071	0	260	0	June
36,349	672	0	1,107	0	299	0	July
34,943	456	0	1,107	0	274	0	Aug.
33,562	467	0	1,071	0	210	0	Sept.
32,281	533	0	1,107	0	157	0	Oct.
31,017	580	0	1,071	0	101	0	Nov.
29,845	832	0	1,107	0	0	0	Dec.
	15,687	0	13,032	0	1,688	0	Total or average
							1899
28,738	1,414	0	1,107	0	0	0	Jan.
27,631	1,244	0	999	0	0	0	Feb.
26,632	1,623	0	1,107	0	0	0	Mar.
25,525	1,262	0	1,071	0	129	0	April
24,325	842	0	1,107	0	171	0	May
23,047	565	0	1,071	0	196	0	June
21,780	221	0	1,107	0	226	0	July
20,447	295	0	1,107	0	204	0	Aug.
19,136	220	0	1,071	0	153	0	Sept.
17,912	683	0	1,107	0	113	0	Oct.
16,692	847	0	1,071	0	71	0	Nov.
15,550	1,247	0	1,107	0	0	0	Dec.
	10,463	0	13,032	0	1,263	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critica period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1900								
Jan.	1,968	19,043	1,968	0	1,352	0	0	0
Feb.	1,111	17,691	1,111	0	1,222	0	0	0
Mar.	1,230	16,469	1,230	0	1,352	0	0	0
April	1,012	15,117	1,012	0	1,309	0	95	0
May	2,275	13,713	2,275	0	1,352	0	121	0
June	893	12,240	893	0	1,309	0	135	0
July	369	10,796	369	0	1,352	0	149	0
Aug.	246	9,295	246	0	1,352	0	123	0
Sept.	238	7,820	238	0	1,309	0	85	0
Oct.	307	6,426	307	0	1,352	0	56	0
Nov.	11,068	5,018	1,058	0	1,309	0	32	0
Dec.	1,269	13,687	1,269	0	1,352	0	0	0
Total or average	21,986		11,976	0	15,922	0	796	0
1901								
Jan.	10,391	12,335	6,661	0	1,352	0	0	0
Feb.	38,709	14,713	8,350	0	1,222	0	0	0
Mar.	13,589	43,850	9,138	0	1,352	0	0	0
April	6,545	46,949	6,545	0	1,309	0	181	0
May	7,440	45,459	6,990	0	1,352	0	240	0
June	3,749	44,317	3,749	0	1,309	0	286	0
July	1,845	42,722	1,845	0	1,352	0	329	0
Aug.	1,240	41,041	1,240	0	1,352	0	300	0
Sept.	1,012	39,389	1,012	0	1,309	0	230	0
Oct.	1,476	37,850	1,476	0	1,352	0	171	0
Nov.	1,904	36,327	1,904	0	1,309	0	109	0
Dec.	1,660	34,909	1,660	0	1,352	0	0	0
Total or average	89,560		50,570	0	15,922	0	1,846	0
1902								
Jan.	1,722	33,557	1,722	0	1,352	0	0	0
Feb.	2,055	32,205	2,055	0	1,222	0	0	0
Mar.	6,088	30,983	5,590	0	1,352	0	0	0
April	3,928	30,129	3,928	0	1,309	0	141	0
May	2,398	28,679	2,398	0	1,352	0	184	0
June	1,190	27,143	1,190	0	1,309	0	214	0
July	676	25,620	676	0	1,352	0	246	0
Aug.	430	24,022	430	0	1,352	0	222	0
Sept.	298	22,448	298	0	1,309	0	167	0
Oct.	430	20,972	430	0	1,352	0	123	0
Nov.	1,131	19,497	1,131	0	1,309	0	77	0
Dec.	1,968	18,111	1,968	0	1,352	0	0	0
Total or average	22,314		21,816	0	15,922	0	1,374	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1900
14,443	1,968	0	1,107	0	0	0	Jan.
13,336	1,111	0	999	0	0	0	Feb.
12,337	1,230	0	1,107	0	0	0	Mar.
11,230	1,012	0	1,071	0	77	0	April
10,082	2,275	0	1,107	0	99	0	May
8,876	893	0	1,071	0	113	0	June
7,692	369	0	1,107	0	121	0	July
6,464	246	0	1,107	0	95	0	Aug.
5,262	238	0	1,071	0	63	0	Sept.
4,128	307	0	1,107	0	40	0	Oct.
2,981	1,058	0	1,071	0	36	0	Nov
11,884	1,269	0	1,107	0	0	0	Dec.
	11,976	0	13,032	0	644	0	Total or average
							1901
10,777	6,661	0	1,107	0	0	0	Jan.
13,400	8,350	0	999	0	0	0	Feb.
42,760	9,138	0	1,107	0	0	0	Mar.
46,104	6.545	0	1,071	0	178	0	April
44,855	6,990	0	1,107	0	246	0	May
43,952	3,749	0	1,071	0	284	0	June
42,597	1,845	0	1,107	0	329	0	July
41,161	1,240	0	1,107	0	301	0	Aug.
39,753	1,012	0	1,071	0	232	0	Sept.
38,450	1,476	0	1,107	0	173	0	Oct.
37,170	1,904	0	1,071	0	111	0	Nov.
35,988	1,660	0	1,107	0	0	0	Dec.
	50,570	0	13,032	0	1,854	0	Total or average
							1902
34,881	1,722	0	1,107	0	0	0	Jan.
33,774	2,055	0	999	0	0	0	Feb.
32,775	5,590	0	1,107	0	0	0	Mar.
32,166	3,928	0	1,071	0	147	0	April
30,948	2,398	0	1,107	0	194	0	May
29,647	1,190	0	1,071	0	226	0	June
28,350	676	0	1,107	0	262	0	July
26,981	430	0	1,107	0	238	0	Aug.
25,636	298	0	1,071	0	178	0	Sept.
24,387	430	0	1,107	0	133	0	Oct.
23,147	1,131	0	1,071	0	85	0	Nov.
21,991	1,968	0	1,107	0	0	0	Dec.
	21,816	0	13,032	0	1,463	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1903								
Jan.	9,100	16,759	2,536	0	1,352	0	0	0
Feb.	5,665	21,971	5,497	0	1,222	0	0	0
Mar.	15,802	20,917	7,898	0	1,352	0	0	0
April	47,127	27,469	9,042	0	1,309	0	180	0
May	13,343	64,065	9,116	0	1,352	0	307	0
June	5,653	66,633	5,653	0	1,309	1,012	365	0
July	2,644	63,947	2,644	0	1,352	1,107	421	0
Aug.	1,783	61,067	1,783	0	1,352	1,045	379	0
Sept.	1,488	58,291	1,488	0	1,309	1,071	288	0
Oct.	1,476	55,623	1,476	0	1,352	0	214	0
Nov.	1,428	54,057	1,428	0	1,309	0	139	0
Dec.	1,476	52,609	1,476	0	1,352	0	0	0
Total or average	106,985		50,037	0	15,922	4,235	2,293	0
1904								
Jan.	1,500	51,257	1,500	0	1,352	0	0	0
Feb.	2,744	49,905	2,177	0	1,265	0	0	0
Mar.	6,813	49,207	4,724	0	1,352	0	0	0
April	5,337	49,944	5,337	0	1,309	0	188	0
May	4,089	48,447	4,089	0	1,352	0	250	0
June	1,517	46,845	1,517	0	1,309	0	296	0
July	861	45,240	861	0	1,352	0	343	0
Aug.	793	43,545	793	0	1,352	0	313	0
Sept.	643	41,880	643	0	1,309	0	238	0
Oct.	738	40,333	738	0	1,352	0	179	0
Nov.	762	38,802	762	0	1,309	0	115	0
Dec.	1,039	37,378	1,039	0	1,352	0	0	0
Total or average	26,836		24,180	0	15,965	0	1,922	0
1905								
Jan.	2,251	36,026	2,251	0	1,352	0	0	0
Feb.	25,880	34,674	8,206	0	1,222	0	0	0
Mar.	75,140	51,126	9,281	13,658	1,352	0	0	0
April	19,580	101,975	9,042	0	1,309	5,949	303	0
May	17,090	104,952	9,344	0	1,352	8,237	411	0
June	8,271	102,698	7,960	0	1,309	9,875	470	0
July	5,103	91,355	5,103	0	1,352	10,266	512	0
Aug.	2,631	79,225	2,631	0	1,352	10,266	432	0
Sept.	1,869	67,175	1,869	0	1,309	9,935	300	0
Oct.	1,770	55,631	1,770	0	1,352	0	214	0
Nov.	2,660	54,065	2,660	0	1,309	0	139	0
Dec.	2,470	52,617	2,470	0	1,352	0	0	0
Total or average	164,715		62,587	13,658	15,922	54,528	2,781	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1903
20,884	2,536	0	1,107	0	0	0	Jan.
26,341	5,497	0	999	0	0	0	Feb.
25,510	7,898	0	1,107	0	0	0	Mar.
32,307	9,042	11,429	1,071	0	192	0	April
57,700	9,116	0	1,107	61	286	0	May
60,473	5,653	0	1,071	892	345	0	June
58,165	2,644	0	1,107	922	397	0	July
55,739	1,783	0	1,107	922	361	0	Aug.
53,349	1,488	0	1,071	952	272	0	Sept.
51,054	1,476	0	1,107	839	202	0	Oct.
48,906	1,428	0	1,071	0	131	0	Nov.
47,704	1,476	0	1,107	0	0	0	Dec.
	50,037	11,429	13,032	4,588	2,186	0	Total or average
							1904
46,597	1,500	0	1,107	0	0	0	Jan.
45,490	2,177	0	1,035	0	0	0	Feb.
45,022	4,724	0	1,107	0	0	0	Mar.
46,004	5,337	0	1,071	0	178	0	April
44,755	4,089	0	1,107	0	240	0	May
43,408	1,517	0	1,071	0	282	0	June
42,055	861	0	1,107	0	327	0	July
40,621	793	0	1,107	0	297	0	Aug.
39,217	643	0	1,071	0	230	0	Sept.
37,916	738	0	1,107	0	171	0	Oct.
36,638	762	0	1,071	0	111	0	Nov.
35,456	1,039	0	1,107	0	0	0	Dec.
	24,180	0	13,068	0	1,836	0	Total or average
							1905
34,349	2,251	0	1,107	0	0	0	Jan.
33,242	8,206	795	999	0	0	0	Feb.
49,122	9,281	64,752	1,107	0	0	0	Mar.
49,122	9,042	7,463	1,071	0	188	0	April
50,938	9,344	0	1,107	0	270	0	May
57,307	7,960	0	1,071	238	333	0	June
55,976	5,103	0	1,107	369	389	0	July
54,111	2,631	0	1,107	369	357	0	Aug.
52,278	1,869	0	1,071	357	270	0	Sept.
50,580	1,770	0	1,107	401	202	0	Oct.
48,870	2,660	0	1,071	0	131	0	Nov.
47,668	2,470	0	1,107	0	0	0	Dec.
	62,587	73,010	13,032	1,734	2,140	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1906								
Jan.	4,240	51,265	3,633	0	1,352	0	0	0
Feb.	3,960	50,520	3,960	0	1,222	0	0	0
Mar.	129,000	49,298	7,561	23,965	1,352	0	0	0
April	34,600	145,420	9,042	15,432	1,309	13,028	357	0
May	21,000	140,852	9,344	0	1,352	15,553	498	0
June	15,500	135,105	9,042	0	1,309	17,843	569	0
July	9,350	121,842	8,664	0	1,352	20,527	609	0
Aug.	4,490	100,040	4,990	0	1,352	20,774	488	0
Sept.	2,840	77,426	2,840	0	1,309	20,043	315	0
Oct.	2,450	55,759	2,450	0	1,352	0	214	0
Nov.	2,400	54,193	2,400	0	1,309	0	139	0
Dec.	11,600	52,745	4,030	0	1,352	0	0	0
Total or average	241,430		67,456	39,397	15,922	107,768	3,189	0
1907								
Jan.	58,400	58,963	9,217	51,921	1,352	0	0	0
Feb.	47,100	54,873	8,439	29,904	1,222	0	0	0
Mar.	116,000	62,408	9,344	45,814	1,352	0	0	0
April	58,400	121,898	9,042	0	1,309	9,221	375	0
May	21,500	160,351	9,344	0	1,352	19,487	539	0
June	15,100	151,129	9,042	0	1,309	21,773	609	0
July	8,360	133,496	7,920	0	1,352	24,466	642	0
Aug.	5,390	107,476	5,390	0	1,352	24,651	462	0
Sept.	3,580	81,011	3,580	0	1,309	23,737	321	0
Oct.	4,090	55,644	4,090	0	1,352	0	214	0
Nov.	3,800	54,078	3,800	0	1,309	0	139	0
Dec.	3,600	52,630	3,600	0	1,352	0	0	0
Total or average	345,320		82,808	127,639	15,922	123,335	3,301	0
1908								
Jan.	11,100	51,278	4,973	5,543	1,352	0	0	0
Feb.	15,000	50,510	8,741	4,616	1,265	0	0	0
Mar.	12,700	50,888	9,255	0	1,352	0	0	0
April	9,280	52,981	8,656	0	1,309	0	196	0
May	7,190	52,100	7,139	0	1,352	0	262	0
June	4,190	50,537	4,190	0	1,309	0	309	0
July	2,560	48,919	2,560	0	1,352	0	359	0
Aug.	2,210	47,208	2,210	0	1,352	0	325	0
Sept.	1,820	45,531	1,820	0	1,309	0	252	0
Oct.	2,070	43,970	2,070	0	1,352	0	186	0
Nov.	1,960	42,432	1,960	0	1,309	0	123	0
Dec.	2,870	41,000	2,870	0	1,352	0	0	0
Total or average	72,950		56,444	10,159	15,965	0	2,012	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1906
46,561	3,633	0	1,107	0	0	0	Jan.
46,061	3,960	0	999	0	0	0	Feb.
45,062	7,561	69,126	1,107	0	0	0	Mar.
96,268	9,042	62,426	1,071	0	224	0	April
58,105	9,344	0	1,107	123	295	0	May
68,236	9,042	0	1,071	2,439	377	0	June
70,807	8,664	0	1,107	4,242	442	0	July
65,702	4,490	0	1,107	4,488	391	0	Aug.
59,716	2,840	0	1,071	4,283	286	0	Sept.
54,076	2,450	0	1,107	3,801	204	0	Oct.
48,964	2,400	0	1,071	0	131	0	Nov.
47,762	4,030	5,103	1,107	0	0	0	Dec.
	67,456	136,655	13,032	19,376	2,350	0	Total or average
							1907
49,122	9,217	48,076	1,107	0	0	0	Jan.
49,122	8,439	37,662	999	0	0	0	Feb.
49,122	9,344	98,043	1,107	0	0	0	Mar.
56,628	9,042	44,649	1,071	0	196	0	April
60,070	9,344	0	1,107	430	303	0	May
70,386	9,042	0	1,071	2,915	385	0	June
72,073	7,920	0	1,107	4,610	448	0	July
66,348	5,390	0	1,107	4,733	395	0	Aug.
60,113	3,580	0	1,071	4,581	290	0	Sept.
54,171	4,090	0	1,107	3,960	204	0	Oct.
48,900	3,800	0	1,071	0	131	0	Nov.
47,698	3,600	0	1,107	0	0	0	Dec.
	82,808	228,430	13,032	21,229	2,352	0	Total or average
							1908
46,591	4,973	2,489	1,107	0	0	0	Jan.
49,122	8,741	5,224	1,035	0	0	0	Feb.
49,122	9,255	2,338	1,107	0	0	0	Mar
49,122	8,656	305	1,071	0	190	0	April
48,180	7,139	0	1,107	0	250	0	May
46,874	4,190	0	1,071	0	295	0	June
45,508	2,560	0	1,107	0	343	0	July
44,058	2,210	0	1,107	0	313	0	Aug.
42,638	1,820	0	1,071	0	240	0	Sept.
41,327	2,070	0	1,107	0	180	0	Oct.
40,040	1,960	0	1,071	0	117	0	Nov.
38,852	2,870	0	1,107	0	0	0	Dec.
	56,444	10,356	13,068	0	1,928	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1909								
Jan.	25,500	39,648	5,596	8,681	1,352	0	0	0
Feb.	59,400	49,519	8,440	41,897	1,222	0	0	0
Mar.	26,300	57,360	9,344	0	1,352	0	0	0
April	28,000	72,964	9,042	0	1,309	1,190	258	0
May	15,200	89,165	9,344	0	1,352	5,041	369	0
June	8,570	88,259	8,319	0	1,309	6,306	428	0
July	5,040	80,467	5,040	0	1,352	6,639	478	0
Aug.	3,120	71,998	3,120	0	1,352	6,578	412	0
Sept.	2,320	63,656	2,320	0	1,309	6,365	295	0
Oct.	2,310	55,687	2,310	0	1,352	0	214	0
Nov.	2,880	54,121	2,880	0	1,309	0	139	0
Dec.	20,900	52,673	6,346	1,682	1,352	0	0	0
Total or average	199,540		72,101	52,260	15,922	32,119	2,593	0
1910								
Jan.	69,500	64,193	9,344	72,870	1,352	0	0	0
Feb.	11,500	50,127	8,435	2,292	1,222	0	0	0
Mar.	9,590	49,678	9,029	0	1,352	0	0	0
April	8,270	48,887	8,120	0	1,309	0	186	0
May	5,050	47,542	5,050	0	1,352	0	250	0
June	3,560	45,940	3,560	0	1,309	0	291	0
July	2,450	44,340	2,450	0	1,352	0	337	0
Aug.	1,710	42,651	1,710	0	1,352	0	307	0
Sept.	1,370	40,992	1,370	0	1,309	0	234	0
Oct.	1,560	39,449	1,560	0	1,352	0	174	0
Nov.	1,870	37,923	1,870	0	1,309	0	113	0
Dec.	2,020	36,501	2,020	0	1,352	0	0	0
Total or average	118,450		54,518	75,162	15,922	0	1,892	0
1911								
Jan.	37,200	35,149	6,441	6,949	1,352	0	0	0
Feb.	44,300	57,607	8,440	38,010	1,222	0	0	0
Mar.	122,000	54,235	9,344	55,857	1,352	0	0	0
April	28,200	109,682	9,042	0	1,309	7,198	325	0
May	16,600	120,008	9,344	0	1,352	11,311	446	0
June	7,500	114,155	7,322	0	1,309	12,671	502	0
July	5,230	99,851	5,230	0	1,352	13,155	537	0
Aug.	3,610	84,807	3,610	0	1,352	13,094	446	0
Sept.	2,830	69,915	2,830	0	1,309	12,612	306	0
Oct.	3,140	55,688	3,140	0	1,352	0	215	0
Nov.	2,800	54,121	2,800	0	1,309	0	139	0
Dec.	2,870	52,673	2,870	0	1,352	0	0	0
Total or average	276,280		70,413	100,816	15,922	70,041	2,916	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season

Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1909
37,745	5,596	7,420	1,107	0	0	0	Jan.
49,122	8,440	49,961	999	0	0	0	Feb.
49,122	9,344	15,849	1,107	0	0	0	Mar.
49,122	9,042	12,977	1,071	0	192	0	April
53,840	9,344	0	1,107	0	276	0	May
58,313	8,319	0	1,071	476	337	0	June
56,680	5,040	0	1,107	553	393	0	July
54,627	3,120	0	1,107	553	357	0	Aug.
52,610	2,320	0	1,071	535	272	0	Sept.
50,732	2,310	0	1,107	527	205	0	Oct.
48,893	2,880	0	1,071	0	133	0	Nov.
47,689	6,346	5,208	1,107	0	0	0	Dec.
	72,101	91,415	13,032	2,644	2,165	0	Total or average
							1910
55,928	9,344	65,855	1,107	0	0	0	Jan.
49,122	8,435	2,147	999	0	0	0	Feb.
49,041	9,029	0	1,107	0	0	0	Mar.
48,495	8,120	0	1,071	0	186	0	April
47,388	5,050	0	1,107	0	248	0	May
46,033	3,560	0	1,071	0	292	0	June
44,670	2,450	0	1,107	0	341	0	July
43,222	1,710	0	1,107	0	311	0	Aug.
41,804	1,370	0	1,071	0	238	0	Sept.
40,495	1,560	0	1,107	0	178	0	Oct.
39,210	1,870	0	1,071	0	117	0	Nov.
38,022	2,020	0	1,107	0	0	0	Dec.
	54,518	68,002	13,032	0	1,911	0	Total or average
							1911
36,915	6,441	10,419	1,107	0	0	0	Jan.
56,148	8,440	41,887	999	0	0	0	Feb.
49,122	9,344	99,133	1,107	0	0	0	Mar.
61,538	9,042	24,943	1,071	0	194	0	April
54,488	9,344	0	1,107	0	280	0	May
60,357	7,322	0	1,071	892	345	0	June
58,227	5,230	0	1,107	984	397	0	July
55,739	3,610	0	1,107	922	361	0	Aug.
53,349	2,830	0	1,071	952	272	0	Sept.
51,054	3,140	0	1,107	867	204	0	Oct.
48,876	2,800	0	1,071	0	141	0	Nov.
47,664	2,870	0	1,107	0	0	0	Dec.
	70,413	176,382	13,032	4,617	2,194	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1912								
Jan.	2,710	51,321	2,710	0	1,352	0	0	0
Feb.	2,230	49,969	2,230	0	1,265	0	0	0
Mar.	22,900	48,704	8,199	0	1,352	0	0	0
April	18,000	62,053	8,515	0	1,309	0	238	0
May	10,900	69,991	8,828	0	1,352	1,168	315	0
June	4,990	69,228	4,990	0	1,309	1,606	373	0
July	3,060	65,940	3,060	0	1,352	1,660	426	0
Aug.	1,960	62,502	1,960	0	1,352	1,660	359	0
Sept.	1,550	59,131	1,550	0	1,309	1,667	291	0
Oct.	1,830	55,864	1,830	0	1,352	0	215	0
Nov.	1,730	54,297	1,730	0	1,309	0	139	0
Dec.	1,760	52,849	1,760	0	1,352	0	0	0
Total or average	73,620		47,362	0	15,965	7,761	2,356	0
1913								
Jan.	2,910	51,497	2,910	0	1,352	0	0	0
Feb.	13,200	50,145	4,753	0	1,222	0	0	0
Mar.	10,200	57,370	8,759	0	1,352	0	0	0
April	7,140	57,459	7,091	0	1,309	0	206	0
May	4,970	55,993	4,970	0	1,352	0	274	0
June	2,890	54,367	2,890	0	1,309	0	321	0
July	1,690	52,737	1,690	0	1,352	0	375	0
Aug.	1,070	51,010	1,070	0	1,352	0	340	0
Sept.	893	49,318	893	0	1,309	0	260	0
Oct.	910	47,749	910	0	1,352	0	196	0
Nov.	2,280	46,201	2,280	0	1,309	0	127	0
Dec.	2,170	44,765	2,170	0	1,352	0	0	0
Total or average	50,323		40,386	0	15,922	0	2,099	0
1914								
Jan.	61,400	43,413	6,271	35,050	1,352	0	0	0
Feb.	121,000	62,140	8,440	58,284	1,222	0	0	0
Mar.	48,000	115,194	9,344	52,388	1,352	0	0	0
April	21,400	100,110	9,042	0	1,309	5,652	301	0
May	16,900	105,206	9,344	0	1,352	8,299	410	0
June	9,580	102,701	8,585	0	1,309	9,875	472	0
July	5,570	92,040	5,570	0	1,352	10,512	516	0
Aug.	3,630	79,660	3,630	0	1,352	10,450	432	0
Sept.	2,730	67,426	2,730	0	1,309	10,113	301	0
Oct.	2,770	55,703	2,770	0	1,352	0	214	0
Nov.	2,440	54,137	2,440	0	1,309	0	139	0
Dec.	4,290	52,689	4,290	0	1,352	0	0	0
Total or average	299,710		72,456	145,722	15,922	54,901	2,785	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season

Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1912
46,557	2,710	0	1,107	0	0	0	Jan.
45,450	2,230	0	1,035	0	0	0	Feb.
44,415	8,199	9,208	1,107	0	0	0	Mar.
48,801	8,515	3,852	1,071	0	192	0	April
53,171	8,828	0	1,107	0	268	0	May
53,868	4,990	0	1,071	0	321	0	June
52,476	3,060	0	1,107	0	375	0	July
50,994	1,960	0	1,107	0	341	0	Aug
49,546	1,550	0	1,071	0	262	0	Sept
48,213	1,830	0	1,107	0	196	0	Oct.
46,910	1,730	0	1,071	0	127	0	Nov
45,712	1,760	0	1,107	0	0	0	Dec.
	47,362	13,060	13,068	0	2,082	0	Total or average
							1913
44,605	2,910	0	1,107	0	0	0	Jan.
43,498	4,753	1,824	999	0	0	0	Feb.
49,122	8,759	863	1,107	0	0	0	Mar.
48,593	7,091	0	1,071	0	186	0	April
47,385	4,970	0	1,107	0	248	0	May
46,030	2,890	0	1,071	0	292	0	June
44,667	1,690	0	1,107	0	341	0	July
43,219	1,070	0	1,107	0	311	0	Aug.
41,801	893	0	1,071	0	238	0	Sept.
40,492	910	0	1,107	0	178	0	Oct.
39,207	2,280	0	1,071	0	115	0	Nov.
38,021	2,170	0	1,107	0	0	0	Dec.
	40,386	2,687	13,032	0	1,909	0	Total or average
							1914
36,914	6,271	30,155	1,107	0	0	0	Jan.
60,781	8,440	60,518	999	0	0	0	Feb.
111,824	9,344	100,251	1,107	0	0	0	Mar.
49,122	9,042	6,877	1,071	0	190	0	April
53,342	9,344	0	1,107	0	278	0	May
59,513	8,585	0	1,071	714	343	0	June
58,380	5,570	0	1,107	984	397	0	July
55,892	3,630	0	1,107	984	361	0	Aug.
53,440	2,730	0	1,071	952	272	0	Sept.
51,145	2,770	0	1,107	920	204	0	Oct.
48,914	2,440	0	1,071	0	131	0	Nov.
47,712	4,290	0	1,107	0	0	0	Dec.
	72,456	197,801	13,032	4,554	2,176	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1915								
Jan.	7,380	51,337	4,428	3,629	1,352	0	0	0
Feb	30,200	49,308	8,412	12,355	1,222	0	0	0
Mar.	21,500	57,519	9,344	0	1,352	0	0	0
April	17,300	68,323	9,042	0	1,309	416	238	0
May	20,400	74,618	9,344	0	1,352	2,090	341	0
June	11,400	81,891	8,967	0	1,309	4,759	414	0
July	7,010	77,842	7,010	0	1,352	5,717	468	0
Aug.	3,980	70,305	3,980	0	1,352	5,717	407	0
Sept.	3,270	62,829	3,270	0	1,309	5,533	293	0
Oct.	2,770	55,694	2,770	0	1,352	0	214	0
Nov.	3,010	54,128	3,010	0	1,309	0	139	0
Dec.	3,580	52,680	3,580	0	1,352	0	0	0
Total or average	131,800		73,157	15,984	15,922	24,232	2,514	0
1916								
Jan.	148,000	51,328	8,759	51,935	1,352	0	0	0
Feb.	39,400	137,282	8,741	99,779	1,265	0	0	0
Mar.	34,800	66,897	9,344	603	1,352	0	0	0
April	19,900	90,398	9,042	0	1,309	4,045	284	0
May	10,400	95,618	9,130	0	1,352	6,393	379	0
June	5,830	88,764	5,830	0	1,309	6,484	430	0
July	4,770	80,541	4,770	0	1,352	6,639	480	0
Aug.	3,570	72,070	3,570	0	1,352	6,639	412	0
Sept.	2,810	63,667	2,810	0	1,309	6,425	295	0
Oct.	7,010	55,638	6,473	0	1,352	0	214	0
Nov.	4,130	54,609	4,130	0	1,309	0	131	0
Dec.	13,600	53,169	5,253	0	1,352	0	0	0
Total or average	294,220		77,852	152,317	15,965	36,625	2,625	0
1917								
Jan.	9,280	60,164	8,172	10,464	1,352	0	0	0
Feb.	13,200	49,456	7,551	0	1,222	0	0	0
Mar.	13,600	53,883	9,344	0	1,352	0	0	0
April	10,500	56,787	9,042	0	1,309	0	208	0
May	8,610	56,728	8,531	0	1,352	0	276	0
June	5,270	55,179	5,270	0	1,309	0	327	0
July	3,140	53,543	3,140	0	1,352	0	379	0
Aug.	2,200	51,812	2,200	0	1,352	0	345	0
Sept.	1,510	50,115	1,510	0	1,309	0	262	0
Oct.	1,560	48,544	1,560	0	1,352	0	198	0
Nov.	1,840	46,994	1,840	0	1,309	0	127	0
Dec.	2,000	45,558	2,000	0	1,352	0	0	0
Total or average	72,710		60,160	10,464	15,922	0	2,122	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season

Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1915
46,605	4,428	0	1,107	0	0	0	Jan.
48,450	8,412	20,117	999	0	0	0	Feb.
49,122	9,344	11,049	1,107	0	0	0	Mar.
49,122	9,042	4,689	1,071	0	188	0	April
51,432	9,344	0	1,107	0	276	0	May
61,105	8,967	0	1,071	1,011	349	0	June
61,107	7,010	0	1,107	1,721	408	0	July
57,871	3,980	0	1,107	1,721	369	0	Aug.
54,674	3,270	0	1,071	1,666	276	0	Sept.
51,661	2,770	0	1,107	1,499	204	0	Oct.
48,851	3,010	0	1,071	0	131	0	Nov.
47,649	3,580	0	1,107	0	0	0	Dec.
	73,157	35,855	13,032	7,618	2,201	0	Total or average
							1916
46,542	8,759	52,105	1,107	0	0	0	Jan.
132,571	8,741	100,650	1,035	0	0	0	Feb.
61,545	9,344	36,772	1,107	0	0	0	Mar.
49,122	9,042	7,311	1,071	0	190	0	April
51,408	9,130	0	1,107	0	262	0	May
51,309	5,830	0	1,071	0	311	0	June
49,927	4,770	0	1,107	0	363	0	July
48,457	3,570	0	1,107	0	331	0	Aug.
47,019	2,810	0	1,071	0	254	0	Sept.
45,694	6,473	0	1,107	0	190	0	Oct.
44,934	4,130	0	1,071	0	127	0	Nov.
43,736	5,253	1,997	1,107	0	0	0	Dec.
	77,852	198,835	13,068	0	2,028	0	Total or average
							1917
48,979	8,172	98	1,107	0	0	0	Jan.
48,882	7,551	4,410	999	0	0	0	Feb.
49,122	9,344	3,149	1,107	0	0	0	Mar.
49,122	9,042	370	1,071	0	190	0	April
48,949	8,531	0	1,107	0	252	0	May
47,669	5,270	0	1,071	0	299	0	June
46,299	3,140	0	1,107	0	347	0	July
44,845	2,200	0	1,107	0	317	0	Aug.
43,421	1,510	0	1,071	0	242	0	Sept.
42,108	1,560	0	1,107	0	182	0	Oct.
40,819	1,840	0	1,071	0	117	0	Nov.
39,631	2,000	0	1,107	0	0	0	Dec.
	60,160	8,027	13,032	0	1,946	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1918								
Jan.	2,020	44,206	2,020	0	1,352	0	0	0
Feb.	9,330	42,854	3,847	0	1,222	0	0	0
Mar.	73,200	47,115	9,249	3,595	1,352	0	0	0
April	17,000	106,119	9,042	0	1,309	6,603	307	0
May	10,000	105,858	8,993	0	1,352	8,422	412	0
June	6,010	96,679	6,010	0	1,309	8,388	454	0
July	3,970	86,528	3,970	0	1,352	8,668	496	0
Aug.	2,840	76,012	2,840	0	1,352	8,606	422	0
Sept.	2,330	65,632	2,330	0	1,309	8,329	297	0
Oct.	2,930	55,697	2,930	0	1,352	0	214	0
Nov.	3,140	54,131	3,140	0	1,309	0	139	0
Dec.	4,370	52,683	4,370	0	1,352	0	0	0
Total or average	137,140		58,741	3,595	15,922	49,016	2,741	0
1919								
Jan.	3,300	51,331	3,300	0	1,352	0	0	0
Feb.	4,110	49,979	4,110	0	1,222	0	0	0
Mar.	6,110	48,757	6,110	0	1,352	0	0	0
April	6,010	47,405	6,010	0	1,309	0	182	0
May	3,810	45,914	3,810	0	1,352	0	244	0
June	1,890	44,318	1,890	0	1,309	0	284	0
July	1,320	42,725	1,320	0	1,352	0	329	0
Aug.	935	41,044	935	0	1,352	0	299	0
Sept.	1,010	39,393	1,010	0	1,309	0	230	0
Oct.	2,040	37,854	2,040	0	1,352	0	171	0
Nov.	2,130	36,331	2,130	0	1,309	0	109	0
Dec.	5,340	34,913	5,209	0	1,352	0	0	0
Total or average	38,005		37,874	0	15,922	0	1,848	0
1920								
Jan.	3,260	33,692	3,260	0	1,352	0	0	0
Feb.	12,700	32,340	5,854	0	1,265	0	0	0
Mar.	36,200	37,921	9,344	0	1,352	0	0	0
April	25,100	63,425	9,042	0	1,309	0	236	0
May	12,600	77,938	9,344	0	1,352	2,766	339	0
June	7,380	76,737	7,349	0	1,309	3,510	395	0
July	4,670	71,554	4,670	0	1,352	3,565	446	0
Aug.	3,200	66,191	3,200	0	1,352	3,627	395	0
Sept.	2,030	60,817	2,030	0	1,309	3,510	290	0
Oct.	2,000	55,708	2,000	0	1,352	0	214	0
Nov.	2,380	54,142	2,380	0	1,309	0	139	0
Dec.	2,210	52,694	2,210	0	1,352	0	0	0
Total or average	113,730		60,683	0	15,965	16,978	2,454	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1918
38,524	2,020	0	1,107	0	0	0	Jan.
37,417	3,847	0	999	0	0	0	Feb.
41,901	9,249	55,623	1,107	0	0	0	Mar.
49,122	9,042	5,345	1,071	0	190	0	April
50,474	8,993	0	1,107	0	258	0	May
50,116	6,010	0	1,071	0	305	0	June
48,740	3,970	0	1,107	0	359	0	July
47,274	2,840	0	1,107	0	327	0	Aug.
45,840	2,330	0	1,071	0	252	0	Sept.
44,517	2,930	0	1,107	0	188	0	Oct.
43,222	3,140	0	1,071	0	121	0	Nov.
42,030	4,370	0	1,107	0	0	0	Dec.
	58,741	60,968	13,032	0	2,000	0	Total or average
							1919
40,923	3,300	0	1,107	0	0	0	Jan.
39,816	4,110	0	999	0	0	0	Feb.
38,817	6,110	0	1,107	0	0	0	Mar.
37,710	6,010	0	1,071	0	161	0	April
36,478	3,810	0	1,107	0	214	0	May
35,157	1,890	0	1,071	0	250	0	June
33,836	1,320	0	1,107	0	290	0	July
32,439	935	0	1,107	0	262	0	Aug.
31,070	1,010	0	1,071	0	200	0	Sept.
29,799	2,040	0	1,107	0	149	0	Oct.
28,543	2,130	0	1,071	0	97	0	Nov.
27,375	5,209	0	1,107	0	0	0	Dec.
	37,874	0	13,032	0	1,623	0	Total or average
							1920
26,399	3,260	0	1,107	0	0	0	Jan.
25,292	5,854	0	1,035	0	0	0	Feb.
31,103	9,344	7,730	1,107	0	0	0	Mar.
49,122	9,042	12,388	1,071	0	190	0	April
51,531	9,344	0	1,107	0	266	0	May
53,414	7,349	0	1,071	0	319	0	June
52,055	4,670	0	1,107	0	371	0	July
50,577	3,200	0	1,107	0	339	0	Aug.
49,131	2,030	0	1,071	0	260	0	Sept
47,800	2,000	0	1,107	0	196	0	Oct.
46,497	2,380	0	1,071	0	127	0	Nov.
45,299	2,210	0	1,107	0	0	0	Dec.
	60,683	20,118	13,068	0	2,068	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1921								
Jan.	5,160	51,342	4,405	0	1,352	0	0	0
Feb.	4,490	50,745	4,490	0	1,222	0	0	0
Mar.	15,400	49,523	7,288	0	1,352	0	0	0
April	6,070	56,283	6,070	0	1,309	0	204	0
May	15,700	54,770	6,835	0	1,352	0	281	0
June	8,980	62,002	7,920	0	1,309	0	354	0
July	3,830	61,399	3,830	0	1,352	184	413	0
Aug.	2,450	59,450	2,450	0	1,352	184	378	0
Sept.	1,840	57,536	1,840	0	1,309	238	286	0
Oct.	2,040	55,703	2,040	0	1,352	0	214	0
Nov.	1,800	54,137	1,800	0	1,309	0	139	0
Dec.	119,000	52,689	5,045	39,506	1,352	0	0	0
Total or average	186,760		54,013	39,506	15,922	606	2,269	0
1922								
Jan.	62,100	125,786	9,344	107,332	1,352	0	0	0
Feb.	88,900	69,858	8,440	83,316	1,222	0	0	0
Mar.	47,800	65,780	9,344	2,882	1,352	0	0	0
April	31,400	100,002	9,042	0	1,309	5,652	311	0
May	24,700	115,088	9,344	0	1,352	10,327	446	0
June	14,400	118,319	9,042	0	1,309	13,742	522	0
July	9,100	108,104	8,576	0	1,352	15,922	565	0
Aug.	5,080	90,789	5,080	0	1,352	16,106	464	0
Sept.	3,290	72,867	3,290	0	1,309	15,527	307	0
Oct.	3,110	55,724	3,110	0	1,352	0	214	0
Nov.	5,310	54,158	4,519	0	1,309	0	141	0
Dec.	21,500	53,499	8,456	1,990	1,352	0	0	0
Total or average	316,690		87,587	195,520	15,922	77,276	2,970	0
1923								
Jan.	7,130	63,201	6,968	12,056	1,352	0	0	0
Feb.	7,830	49,955	7,791	0	1,222	0	0	0
Mar.	7,320	48,772	7,320	0	1,352	0	0	0
April	8,330	47,420	8,079	0	1,309	0	182	0
May	5,480	46,180	5,480	0	1,352	0	244	0
June	3,700	44,584	3,700	0	1,309	0	288	0
July	2,420	42,987	2,420	0	1,352	0	331	0
Aug.	1,990	41,304	1,990	0	1,352	0	299	0
Sept.	1,750	39,653	1,750	0	1,309	0	232	0
Oct.	1,710	38,112	1,710	0	1,352	0	171	0
Nov.	1,960	36,589	1,960	0	1,309	0	111	0
Dec.	2,130	35,169	2,130	0	1,352	0	0	0
Total or average	51,750		51,298	12,056	15,922	0	1,858	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
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Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1921
44,192	4,405	0	1,107	0	0	0	Jan.
43,840	4,490	0	999	0	0	0	Feb.
42,841	7,288	899	1,107	0	0	0	Mar.
48,947	6,070	0	1,071	0	186	0	April
47,690	6,835	0	1,107	0	250	0	May
55,198	7,920	0	1,071	0	329	0	June
54,858	3,830	0	1,107	61	385	0	July
53,305	2,450	0	1,107	61	353	0	Aug.
51,784	1,840	0	1,071	119	270	0	Sept.
50,324	2,040	0	1,107	111	204	0	Oct.
48,902	1,800	0	1,071	0	131	0	Nov.
47,700	5,045	45,446	1,107	0	0	0	Dec.
	54,013	46,345	13,032	352	2,108	0	Total or average
							1922
115,102	9,344	107,317	1,107	0	0	0	Jan.
59,434	8,440	86,263	999	0	0	0	Feb.
52,632	9,344	40,859	1,107	0	0	0	Mar.
49,122	9,042	13,915	1,071	0	192	0	April
56,302	9,344	0	1,107	0	297	0	May
70,254	9,042	0	1,071	2,856	385	0	June
71,300	8,576	0	1,107	4,365	444	0	July
65,908	5,080	0	1,107	4,549	393	0	Aug.
59,859	3,290	0	1,071	4,402	282	0	Sept.
54,104	3,110	0	1,107	3,801	202	0	Oct.
48,994	4,519	260	1,071	0	133	0	Nov.
48,321	8,456	11,295	1,107	0	0	0	Dec.
	87,587	259,909	13,032	19,973	2,328	0	Total or average
							1923
48,963	6,968	0	1,107	0	0	0	Jan.
48,018	7,791	0	999	0	0	0	Feb.
47,058	7,320	0	1,107	0	0	0	Mar.
45,951	8,079	0	1,071	0	178	0	April
44,953	5,480	0	1,107	0	240	0	May
43,606	3,700	0	1,071	0	284	0	June
42,251	2,420	0	1,107	0	329	0	July
40,815	1,990	0	1,107	0	299	0	Aug.
39,409	1,750	0	1,071	0	236	0	Sept.
38,102	1,710	0	1,107	0	173	0	Oct.
36,822	1,960	0	1,071	0	111	0	Nov.
35,640	2,130	0	1,107	0	0	0	Dec.
	51,298	0	13,032	0	1,850	0	Total or average

TABLE 15a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1924								
Jan.	2,170	33,817	2,170	0	1,352	0	0	0
Feb.	1,790	32,465	1,790	0	1,265	0	0	0
Mar.	4,130	31,200	3,714	0	1,352	0	0	0
April	6,190	30,264	6,190	0	1,309	0	141	0
May	3,650	28,814	3,650	0	1,352	0	186	0
June	1,660	27,276	1,660	0	1,309	0	214	0
July	1,000	25,753	1,000	0	1,352	0	248	0
Aug.	756	24,153	756	0	1,352	0	222	0
Sept.	744	22,579	744	0	1,309	0	167	0
Oct.	873	21,103	873	0	1,352	0	123	0
Nov.	1,190	19,628	1,190	0	1,309	0	79	0
Dec.	1,780	18,240	1,780	0	1,352	0	0	0
Total or average	25,933		25,517	0	15,965	0	1,380	0
1925								
Jan.	1,710	16,888	1,710	0	1,352	0	0	0
Feb.	1,620	15,536	1,620	0	1,222	0	0	0
Mar.	2,510	14,314	2,423	0	1,352	0	0	0
April	7,200	13,049	5,765	0	1,309	0	89	0
May	3,050	13,086	3,050	0	1,352	0	105	0
June	1,840	11,629	1,840	0	1,309	0	131	0
July	824	10,189	824	0	1,352	0	141	0
Aug.	621	8,696	621	0	1,352	0	117	0
Sept.	492	7,227	492	0	1,309	0	81	0
Oct.	873	5,837	873	0	1,352	0	52	0
Nov.	1,010	4,433	1,010	0	1,309	0	28	0
Dec.	1,650	3,096	1,650	0	1,352	0	0	0
Total or average	23,400		21,878	0	15,922	0	744	0
1926								
Jan.	1,540	1,744	1,540	0	1,352	0	0	0
Feb.	7,940	392	5,485	0	1,222	0	0	0
Mar.	3,650	1,625	3,650	0	1,352	0	0	0
April	69,000	273	8,233	0	1,309	0	159	0
May	13,000	59,572	9,142	0	1,352	0	293	0
June	5,500	61,785	5,500	0	1,309	0	349	0
July	3,120	60,127	3,120	0	1,352	0	408	0
Aug.	2,070	58,367	2,070	0	1,352	0	373	0
Sept.	1,580	56,642	1,580	0	1,309	0	284	0
Oct.		55,049						
Nov.								
Dec.								
Total or average	107,400		40,320	0	11,909	0	1,866	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
							1924
34,533	2,170	0	1,107	0	0	0	Jan.
33,426	1,790	0	1,035	0	0	0	Feb.
32,391	3,714	0	1,107	0	0	0	Mar.
31,700	6,190	0	1,071	0	147	0	April
30,482	3,650	0	1,107	0	192	0	May
29,183	1,660	0	1,071	0	224	0	June
27,888	1,000	0	1,107	0	260	0	July
26,521	756	0	1,107	0	236	0	Aug.
25,178	744	0	1,071	0	178	0	Sept.
23,929	873	0	1,107	0	131	0	Oct.
22,691	1,190	0	1,071	0	85	0	Nov.
21,535	1,780	0	1,107	0	0	0	Dec.
	25,517	0	13,068	0	1,453	0	Total or average
							1925
20,428	1,710	0	1,107	0	0	0	Jan.
19,321	1,620	0	999	0	0	0	Feb.
18,322	2,423	0	1,107	0	0	0	Mar.
17,302	5,765	0	1,071	0	105	0	April
17,561	3,050	0	1,107	0	141	0	May
16,313	1,840	0	1,071	0	163	0	June
15,079	824	0	1,107	0	184	0	July
13,788	621	0	1,107	0	163	0	Aug.
12,518	492	0	1,071	0	117	0	Sept.
11,330	873	0	1,107	0	85	0	Oct.
10,138	1,010	0	1,071	0	52	0	Nov.
9,015	1,650	0	1,107	0	0	0	Dec.
	21,878	0	13,032	0	1,010	0	Total or average
							1926
7,908	1,540	0	1,107	0	0	0	Jan.
6,801	5,485	0	999	0	0	0	Feb.
8,257	3,650	0	1,107	0	0	0	Mar.
7,150	8,233	11,836	1,071	0	165	0	April
54,845	9,142	0	1,107	0	276	0	May
57,320	5,500	0	1,071	238	319	0	June
55,692	3,120	0	1,107	246	387	0	July
53,952	2,070	0	1,107	307	355	0	Aug.
52,183	1,580	0	1,071	297	270	0	Sept.
50,545							Oct.
							Nov.
							Dec.
	40,320	11,836	9,747	1,088	1.772	0	Total or average

TABLE 15a (Concluded). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
COORDINATED WITH SEASONAL
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.
Natural flow up to 152 second-feet passed for prior rights.

Year and month	Run-off at Azusa in acre-feet	Flood control by reservoir operating diagram. Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram						
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
Total for period, Jan. 1, 1897, to Oct. 1, 1926	**3,731,977**		**1,513,303**	**[a]1,010,662**	**473,905**	**676,322**	**65,386**	
Average for period, Jan. 1, 1897, to Oct. 1, 1926	**125,445**		**50,867**	**[a]33,972**	**15,930**	**22,734**	**2,198**	**0**

[a] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

RESERVOIR ON SAN GABRIEL RIVER.

TWO METHODS OF FLOOD CONTROL AND OVER-YEAR STORAGE.

tions Carried out on a Daily Basis.

mary, see Table 15, page 180.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.
Reservoir emptied of seasonal storage each year.

Flood control, holding maximum reservoir space required (131,000 acre-feet) in reserve throughout flood season
Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 18 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (18 second-feet) in acre-feet	Seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
	1,513,303	**1,685,053**	**387,891**	**87,773**	**56,534**	**0**	**Total for period, Jan. 1, 1897, to Oct. 1, 1926**
	50,867	**55,641**	**13,039**	**[b]2,950**	**1,900**	**0**	**Average for period, Jan. 1, 1897, to Oct. 1, 1926**

[b] In the computations for this table, the period of analysis closed with 1423 acre-feet more water in storage than at the beginning, the equivalent of 48 acre-feet per season. Since in the computations this water was stored in the last year of the period of analysis, the exact yield in seasonally stored water for the period is larger than here shown by this amount.

TABLE 16a. SAN GABRIEL RESER

COMPARISON OF WATER YIELD FOR USE OF RES

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	**Flood control alone** Water drawn from reservoir only as required by reservoir operating diagram					**Flood control partially** Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1897									
Jan.	3,617	62,650	3,617	13,131	0	0	62,650	3,617	11,779
Feb.	19,146	49,519	7,262	5,432	0	0	49,519	7,262	4,628
Mar.	28,623	55,971	9,344	0	0	0	55,553	9,344	0
April	17,519	75,250	9,042	0	238	0	73,480	9,042	0
May	8,851	83,489	8,126	0	369	0	80,413	8,126	0
June	4,033	83,845	4,033	0	426	0	79,433	4.033	0
July	2,343	83,419	2,343	0	504	0	77,712	2,343	0
Aug.	1,613	82,915	1,613	0	466	0	75,875	1,613	0
Sept.	1,226	82,449	1,226	0	359	0	74,083	1,226	0
Oct.	5,564	82,090	2,622	0	280	0	72,437	2,622	0
Nov.	1,860	84,752	1,860	0	188	0	73,769	1,860	0
Dec.	1,875	84,564	1,875	11,646	0	0	72,289	1,875	0
Total or average	96,270		52,963	30,209	2,830	0		52,963	16,407
1898									
Jan.	2,453	72,918	2,453	13,484	0	0	70,937	2,453	10,849
Feb.	2,241	59,434	2,241	0	0	0	58,736	2,241	0
Mar.	2,131	59,434	2,131	0	0	0	57,514	2,131	0
April	1,950	59,434	1,950	0	210	0	56,162	1,950	0
May	2,213	59,224	2,213	0	286	0	54,651	2,213	0
June	1,159	58,938	1,159	0	343	0	53,029	1,159	0
July	672	58,595	672	0	403	0	51.395	672	0
Aug.	456	58,192	456	0	375	0	49,674	456	0
Sept.	467	57,817	467	0	289	0	47,985	467	0
Oct.	533	57,528	533	0	222	0	46,420	533	0
Nov.	580	57,306	580	0	145	0	44,876	580	0
Dec.	832	57,161	832	0	0	0	43,442	832	0
Total or average	15,687		15,687	13,484	2,273	0		15,687	10,849
1899									
Jan.	1,414	57,161	1,414	0	0	0	42,090	1,414	0
Feb.	1,244	57,161	1,244	0	0	0	40,738	1,244	0
Mar.	1,623	57,161	1,623	0	0	0	39,516	1,623	0
April	1,262	57,161	1,262	0	206	0	38,164	1,262	0
May	842	56,955	842	0	280	0	36,694	842	0
June	565	56,675	565	0	333	0	35,128	565	0
July	221	56,342	221	0	393	0	33,571	221	0
Aug.	295	55,949	295	0	366	0	31,931	295	0
Sept.	220	55,583	220	0	284	0	30,319	220	0
Oct.	683	55,299	683	0	214	0	28,812	683	0
Nov.	847	55,085	847	0	143	0	27,313	847	0
Dec.	1,247	54,942	1,247	0	0	0	25,913	1,247	0
Total or average	10,463		10,463	0	2,219	0		10,463	0

VOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE
ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			Flood control completely coordinated with conservation Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre feet	Waste over spillway in acre-feet	Year and month
										1897
1,352	0	0	62,650	3,617	11,779	1,352	0	0	0	Jan.
1,222	0	0	49,519	7,262	4,628	1,222	0	0	0	Feb.
1,352	0	0	55,553	9,344	0	1,352	0	0	0	Mar.
1,309	235	0	73,480	9,042	0	1,309	1,249	234	0	April
1,352	353	0	79,165	8,126	0	1,352	3,012	343	0	May
1,309	412	0	75,183	4,033	0	1,309	3,093	396	0	June
1,352	485	0	70,385	2,343	0	1,352	3,197	447	0	July
1,352	440	0	65,389	1,613	0	1,352	3,197	393	0	Aug.
1,309	337	0	60,447	1,226	0	1,309	3,153	290	0	Sept.
1,352	258	0	55,695	2,622	0	1,352	0	220	0	Oct.
1,309	171	0	57,065	1,860	0	1,309	0	143	0	Nov.
1,352	0	0	55,613	1,875	0	1,352	0	0	0	Dec.
15,922	2,691	0		52,963	16,407	15,922	16,901	2,466	0	Total or average
										1898
1,352	0	0	54,261	2,453	0	1,352	0	0	0	Jan.
1,222	0	0	52,909	2,241	0	1,222	0	0	0	Feb.
1,352	0	0	51,687	2,131	0	1,352	0	0	0	Mar.
1,309	202	0	50,335	1,950	0	1,309	0	190	0	April
1,352	270	0	48,836	2,213	0	1,352	0	252	0	May
1,309	325	0	47,232	1,159	0	1,309	0	296	0	June
1,352	369	0	45,627	672	0	1,352	0	343	0	July
1,352	337	0	43,932	456	0	1,352	0	313	0	Aug.
1,309	256	0	42,267	467	0	1,309	0	238	0	Sept.
1,352	192	0	40,720	533	0	1,352	0	179	0	Oct.
1,309	125	0	39,189	580	0	1,309	0	115	0	Nov.
1,352	0	0	37,765	832	0	1,352	0	0	0	Dec.
15,922	2,076	0		15,687	0	15,922	0	1,926	0	Total or average
										1899
1,352	0	0	36,413	1,414	0	1,352	0	0	0	Jan.
1,222	0	0	35,061	1,244	0	1,222	0	0	0	Feb.
1,352	0	0	33,839	1,623	0	1,352	0	0	0	Mar.
1,309	161	0	32,487	1,262	0	1,309	0	149	0	April
1,352	214	0	31,029	842	0	1,352	0	194	0	May
1,309	248	0	29,483	565	0	1,309	0	224	0	June
1,352	288	0	27,950	221	0	1,352	0	260	0	July
1,352	260	0	26,338	295	0	1,352	0	234	0	Aug.
1,309	198	0	24,752	220	0	1,309	0	175	0	Sept.
1,352	147	0	23,268	683	0	1,352	0	129	0	Oct.
1,309	91	0	21,787	847	0	1,309	0	83	0	Nov.
1,352	0	0	20,395	1,247	0	1,352	0	0	0	Dec.
15,922	1,607	0	0	10,463	0	15,922	0	1,448	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR USE OF RES

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1900									
Jan.	1,968	54,942	1,968	0	0	0	24,561	1,968	0
Feb.	1,111	54,942	1,111	0	0	0	23,209	1,111	0
Mar.	1,230	54,942	1,230	0	0	0	21,987	1,230	0
April	1,012	54,942	1,012	0	200	0	20,635	1,012	0
May	2,275	54,742	2,275	0	272	0	19,211	2,275	0
June	893	54,470	893	0	327	0	17,712	893	0
July	369	54,143	369	0	385	0	16,223	369	0
Aug.	246	53,758	246	0	357	0	14,679	246	0
Sept.	238	53,401	238	0	276	0	13,158	238	0
Oct.	307	53,125	307	0	210	0	11,728	307	0
Nov.	11,068	52,915	1,058	0	139	0	10,281	1,058	0
Dec.	1,269	62,786	1,269	0	0	0	18,923	1,269	0
Total or average	21,986		11,976	0	2,166	0		11,976	0
1901									
Jan.	10,391	62,786	6,661	16,586	0	0	17,571	6,661	0
Feb.	38,709	49,930	8,350	19,884	0	0	19,949	8,350	0
Mar.	13,589	60,405	9,138	0	0	0	49,086	9,138	0
April	6,545	64,856	6,545	0	224	0	52,185	6,545	0
May	7,440	64,632	6,990	0	301	0	50,684	6,990	0
June	3,749	64,781	3,749	0	363	0	49,522	3,749	0
July	1,845	64,418	1,845	0	426	0	47,908	1,845	0
Aug.	1,240	63,992	1,240	0	397	0	46,203	1,240	0
Sept.	1,012	63,595	1,012	0	305	0	44,530	1,012	0
Oct.	1,476	63,290	1,476	0	234	0	42,975	1,476	0
Nov.	1,904	63,056	1,904	0	155	0	41,439	1,904	0
Dec.	1,660	62,901	1,660	0	0	0	40,015	1,660	0
Total or average	89,560		50,570	36,470	2,405	0		50,570	
1902									
Jan.	1,722	62,901	1,722	0	0	0	38,663	1,722	0
Feb.	2,055	62,901	2,055	0	0	0	37,311	2,055	0
Mar.	6,088	62,901	5,590	0	0	0	36,089	5,590	0
April	3,928	63,399	3,928	0	218	0	35,235	3,928	0
May	2,398	63,181	2,398	0	295	0	33,773	2,398	0
June	1,190	62,886	1,190	0	355	0	32,217	1,190	0
July	676	62,531	676	0	420	0	30,672	676	0
Aug.	430	62,111	430	0	389	0	29,048	430	0
Sept.	298	61,722	298	0	301	0	27,450	298	0
Oct.	430	61,421	430	0	228	0	25,955	430	0
Nov.	1,131	61,193	1,131	0	151	0	24,464	1,131	0
Dec.	1,968	61,042	1,968	0	0	0	23,068	1,968	0
Total or average	22,314		21,816	0	2,357	0		21,816	0

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							Year and month
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	
										1900
1,352	0	0	19,043	1,968	0	1,352	0	0	0	Jan.
1,222	0	0	17,691	1,111	0	1,222	0	0	0	Feb.
1,352	0	0	16,469	1,230	0	1,352	0	0	0	Mar.
1,309	115	0	15,117	1,012	0	1,309	0	95	0	April
1,352	147	0	13,713	2,275	0	1,352	0	121	0	May
1,309	180	0	12,240	893	0	1,309	0	135	0	June
1,352	192	0	10,796	369	0	1,352	0	149	0	July
1,352	169	0	9,295	246	0	1,352	0	123	0	Aug.
1,309	121	0	7,820	238	0	1,309	0	85	0	Sept.
1,352	95	0	6,426	307	0	1,352	0	56	0	Oct.
1,309	59	0	5,018	1,058	0	1,309	0	32	0	Nov.
1,352	0	0	13,687	1,269	0	1,352	0	0	0	Dec.
15,922	1,078	0		11,976	0	15,922	0	796	0	Total or average
										1901
1,352	0	0	12,335	6,661	0	1,352	0	0	0	Jan.
1,222	0	0	14,713	8,350	0	1,222	0	0	0	Feb.
1,352	0	0	43,850	9,138	0	1,352	0	0	0	Mar.
1,309	192	0	46,949	6,545	0	1,309	0	181	0	April
1,352	260	0	45,459	6,990	0	1,352	0	240	0	May
1,309	305	0	44,317	3,749	0	1,309	0	286	0	June
1,352	353	0	42,722	1,845	0	1,352	0	329	0	July
1,352	321	0	41,041	1,240	0	1,352	0	300	0	Aug.
1,309	246	0	39,389	1,012	0	1,309	0	230	0	Sept.
1,352	184	0	37,850	1,476	0	1,352	0	171	0	Oct.
1,309	115	0	36,327	1,904	0	1,309	0	109	0	Nov.
1,352	0	0	34,909	1,660	0	1,352	0	0	0	Dec.
15,922	1,976	0		50,570	0	15,922	0	1,846	0	Total or average
										1902
1,352	0	0	33,557	1,722	0	1,352	0	0	0	Jan.
1,222	0	0	32,205	2,055	0	1,222	0	0	0	Feb.
1,352	0	0	30,983	5,590	0	1,352	0	0	0	Mar.
1,309	153	0	30,729	3,928	0	1,309	0	141	0	April
1,352	204	0	28,679	2,398	0	1,352	0	184	0	May
1,309	236	0	27,143	1,190	0	1,309	0	214	0	June
1,352	272	0	25,620	676	0	1,352	0	246	0	July
1,352	246	0	24,022	430	0	1,352	0	222	0	Aug.
1,309	186	0	22,448	298	0	1,309	0	167	0	Sept.
1,352	139	0	20,972	430	0	1,352	0	123	0	Oct.
1,309	87	0	19,497	1,131	0	1,309	0	77	0	Nov.
1,352	0	0	18,111	1,968	0	1,352	0	0	0	Dec.
15,922	1,523	0		21,816	0	15,922	0	1,374	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1903									
Jan.	9,100	61,042	2,536	12,128	0	0	21,716	2,536	0
Feb.	5,665	55,478	5,497	5,959	0	0	26,928	5,497	0
Mar.	15,802	49,687	7,898	0	0	0	25,874	7,898	0
April	47,127	57,591	9,042	0	260	0	32,426	9,042	0
May	13,343	95,416	9,116	0	369	0	68,994	9,116	0
June	5,653	99,274	5,653	0	476	0	71,546	5,653	0
July	2,644	98,798	2,644	0	561	0	69,852	2,644	0
Aug.	1,783	98,237	1,783	0	522	0	68,054	1,783	0
Sept.	1,488	97,715	1,488	0	403	0	66,292	1,488	0
Oct.	1,476	97,312	1,476	0	305	0	64,670	1,476	0
Nov.	1,428	97,007	1,428	0	204	0	63,082	1,428	0
Dec.	1,476	96,803	1,476	0	0	0	61,618	1,476	0
Total or average	106,985		50,037	18,087	3,100	0		50,037	0
1904									
Jan.	1,500	96,803	1,500	0	0	0	60,266	1,500	0
Feb.	2,744	96,803	2,177	0	0	0	58,914	2,177	0
Mar.	6,813	97,370	4,724	0	0	0	58,216	4,724	0
April	5,337	99,459	5,337	0	295	0	58,953	5,337	0
May	4,089	99,164	4,089	0	397	0	57,436	4,089	0
June	1,517	98,767	1,517	0	476	0	55,804	1,517	0
July	861	98,291	861	0	559	0	54,166	861	0
Aug.	793	97,732	793	0	520	0	52,431	793	0
Sept.	643	97,212	643	0	401	0	50,730	643	0
Oct.	738	96,811	738	0	305	0	49,155	738	0
Nov.	762	96,506	762	0	204	0	47,597	762	0
Dec.	1,039	96,302	1,039	0	0	0	46,155	1,039	0
Total or average	26,836		24,180	0	3,157	0		24,180	0
1905									
Jan.	2,251	96,302	2,251	17,237	0	0	44,803	2,251	0
Feb.	25,880	79,065	8,206	41,863	0	0	43,451	8,206	6,204
Mar.	75,140	54,876	9,281	18,198	0	0	53,699	9,281	16,231
April	19,580	102,537	9,042	0	313	0	101,975	9,042	0
May	17,090	112,762	9,344	0	446	0	110,893	9,344	0
June	8,271	120,062	7,960	0	543	0	116,849	7,960	0
July	5,103	119,830	5,103	0	639	0	115,322	5,103	0
Aug.	2,631	119,191	2,631	0	593	0	113,349	2,631	0
Sept.	1,869	118,598	1,869	0	456	0	111,426	1,869	0
Oct.	1,770	118,142	1,770	0	347	0	109,681	1,770	0
Nov.	2,660	117,795	2,660	14,595	232	0	108,000	2,660	3,610
Dec.	2,470	102,968	2,470	7,444	0	0	102,861	2,470	6,944
Total or average	164,715		62,587	99,337	3,569	0		62,587	32,989

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1903
1,352	0	0	16,759	2,536	0	1,352	0	0	0	Jan.
1,222	0	0	21,971	5,497	0	1,222	0	0	0	Feb.
1,352	0	0	20,917	7,898	0	1,352	0	0	0	Mar.
1,309	208	0	27,469	9,042	0	1,309	0	180	0	April
1,352	323	0	64,065	9,116	0	1,352	0	307	0	May
1,309	385	0	66,633	5,653	0	1,309	1,012	365	0	June
1,352	446	0	63,947	2,644	0	1,352	1,107	421	0	July
1,352	410	0	61,067	1,783	0	1,352	1,045	379	0	Aug.
1,309	313	0	58,291	1,488	0	1,309	1,071	288	0	Sept.
1,352	236	0	55,623	1,476	0	1,352	0	214	0	Oct.
1,309	155	0	54,057	1,428	0	1,309	0	139	0	Nov
1,352	0	0	52,609	1,476	0	1,352	0	0	0	Dec.
15,922	2,476	0		50,037	0	15,922	4,235	2,293	0	Total or average
										1904
1,352	0	0	51,257	1,500	0	1,352	0	0	0	Jan.
1,265	0	0	49,905	2,177	0	1,265	0	0	0	Feb.
1,352	0	0	49,207	4,724	0	1,352	0	0	0	Mar.
1,309	208	0	49,944	5,337	0	1,309	0	188	0	April
1,352	280	0	48,447	4,089	0	1,352	0	250	0	May
1,309	329	0	46,845	1,517	0	1,309	0	296	0	June
1,352	383	0	45,240	861	0	1,352	0	343	0	July
1,352	349	0	43,545	793	0	1,352	0	313	0	Aug.
1,309	266	0	41,880	643	0	1,309	0	238	0	Sept.
1,352	206	0	40,333	738	0	1,352	0	179	0	Oct.
1,309	133	0	38,802	762	0	1,309	0	115	0	Nov.
1,352	0	0	37,378	1,039	0	1,352	0	0	0	Dec.
15,965	2,154	0		24,180	0	15,965	0	1,922	0	Total or average
										1905
1,352	0	0	36,026	2,251	0	1,352	0	0	0	Jan.
1,222	0	0	34,674	8,206	0	1,222	0	0	0	Feb.
1,352	0	0	51,126	9,281	13,658	1,352	0	0	0	Mar.
1,309	311	0	101,975	9,042	0	1,309	5,949	303	0	April
1,352	438	0	104,952	9,344	0	1,352	8,237	411	0	May
1,309	529	0	102,698	7,960	0	1,309	9,875	470	0	June
1,352	621	0	91,355	5,103	0	1,352	10,266	512	0	July
1,352	571	0	79,225	2,631	0	1,352	10,266	432	0	Aug.
1,309	436	0	67,175	1,869	0	1,309	9,935	300	0	Sept.
1,352	329	0	55,631	1,770	0	1,352	0	214	0	Oct.
1,309	220	0	54,065	2,660	0	1,309	0	139	0	Nov.
1,352	0	0	52,617	2,470	0	1,352	0	0	0	Dec.
15,922	3,455	0		62,587	13,658	15,922	54,528	2,781	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram: Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Flood control partially. Constant draft of 22 second-only as required by: Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1906									
Jan.	4,240	95,524	3,633	35,706	0	0	94,565	3,633	33,608
Feb.	3,960	60,425	3,960	0	0	0	60,212	3,960	0
Mar.	129,000	60,425	7,561	33,037	0	0	58,990	7,561	30,250
April	34,600	148,827	9,042	20,997	383	0	148,827	9,042	20,735
May	21,000	153,005	9,344	0	543	0	151,960	9,344	0
June	15,500	164,118	9,042	0	682	0	161,723	9,042	0
July	9,350	169,894	8,664	0	811	0	166,198	8,664	0
Aug.	4,490	169,769	4,490	0	756	0	164,729	4,490	0
Sept.	2,840	169.013	2,840	0	583	0	162,639	2,840	0
Oct.	2,450	168,430	2,450	0	444	0	160,763	2,450	0
Nov.	2,400	167,986	2,400	14,928	295	0	158,981	2,400	5,941
Dec.	11,600	152,763	4,030	97,132	0	0	151,445	4,030	94,462
Total or average	241,430		67,456	201,800	4,497	0		67,456	184,996
1907									
Jan.	58,400	63,201	9,217	57,512	0	0	63,201	9,217	56,159
Feb.	47,100	54,872	8,439	31,125	0	0	54,873	8,439	29,904
Mar.	116,000	62,408	9,344	47,166	0	0	62,408	9,344	45.814
April	58,400	121,898	9,042	528	393	0	121,898	9,042	453
May	21,500	170,335	9,344	0	591	1,900	169,103	9,344	0
June	15,100	180,000	9,042	0	720	5,338	179,322	9,042	0
July	8,360	180,000	7,920	0	849	188	180,000	7,920	0
Aug.	5,390	179,403	5,390	0	787	0	178,241	5,390	0
Sept.	3,580	178,616	3,580	0	607	0	176,108	3,580	0
Oct.	4,090	178,009	4,090	8,257	460	0	174,200	4,090	3,106
Nov.	3,800	169,292	3,800	54,872	256	0	169,292	3,800	53,565
Dec.	3,600	114,164	3,600	12,600	0	0	114,164	3,600	12,164
Total or average	345,320		82,808	212,060	4,663	7,426		82,808	201,165
1908									
Jan.	11,100	101,564	4,973	24,579	0	0	100,648	4,973	24,273
Feb.	15,000	83,112	8,741	37,743	0	0	81,150	8,741	35,256
Mar.	12,700	51,628	9,255	0	0	0	50,888	9,255	0
April	9,280	55,073	8,656	0	202	0	52,981	8,656	0
May	7,190	55,495	7,139	0	337	0	52,100	7,139	0
June	4,190	55,209	4,190	0	329	0	50,537	4,190	0
July	2,560	54,880	2,560	0	387	0	48,919	2,560	0
Aug.	2,210	54,493	2,210	0	361	0	47,208	2,210	0
Sept.	1,820	54,132	1,820	0	278	0	45,531	1,820	0
Oct.	2,070	53,854	2,070	0	212	0	43,970	2,070	0
Nov.	1,960	53,642	1,960	0	139	0	42,432	1,960	0
Dec.	2,870	53,503	2,870	0	0	0	41,000	2,870	0
Total or average	72,950		56,444	62,322	2,245	0		56,444	59,529

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained. other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1906
1,352	0	0	51,265	3,633	0	1,352	0	0	0	Jan.
1,222	0	0	50,520	3,960	0	1,222	0	0	0	Feb.
1,352	0	0	49,298	7,561	23,965	1,352	0	0	0	Mar.
1,309	381	0	145,420	9,042	15,432	1,309	13,028	357	0	April
1,352	541	0	140,852	9,344	0	1,352	15,553	498	0	May
1,309	674	0	135,105	9,042	0	1,309	17,843	569	0	June
1,352	803	0	121,842	8,664	0	1,352	20,527	609	0	July
1,352	738	0	100,040	4,490	0	1,352	20,774	488	0	Aug.
1,309	567	0	77,426	2,840	0	1,309	20,043	315	0	Sept.
1,352	430	0	55,759	2,450	0	1,352	0	214	0	Oct.
1,309	286	0	54,193	2,400	0	1,309	0	139	0	Nov.
1,352	0	0	52,745	4,030	0	1,352	0	0	0	Dec.
15,922	4,420	0		67,456	39,397	15,922	107,768	3,189	0	Total or average
										1907
1,352	0	0	58,963	9,217	51,921	1,352	0	0	0	Jan.
1,222	0	0	54,873	8,439	29,904	1,222	0	0	0	Feb.
1,352	0	0	62,408	9,344	45,814	1,352	0	0	0	Mar.
1,309	391	0	121,898	9,042	0	1,309	9,221	375	0	April
1,352	585	0	160,351	9,344	0	1,352	19,487	539	0	May
1,309	720	3,351	151,129	9,042	0	1,309	21,773	609	0	June
1,352	847	0	133,496	7,920	0	1,352	24,466	642	0	July
1,352	781	0	107,476	5,390	0	1,352	24,651	462	0	Aug.
1,309	599	0	81,011	3,580	0	1,309	23,737	321	0	Sept.
1,352	450	0	55,644	4,090	0	1,352	0	214	0	Oct.
1,309	254	0	54,078	3,800	0	1,309	0	139	0	Nov.
1,352	0	0	52,630	3,600	0	1,352	0	0	0	Dec.
15,922	4,627	3,351		82,808	127,639	15,922	123,335	3,301	0	Total or average
										1908
1,352	0	0	51,278	4,973	5,543	1,352	0	0	0	Jan.
1,265	0	0	50,510	8,741	4,616	1,265	0	0	0	Feb.
1,352	0	0	50,888	9,255	0	1,352	0	0	0	Mar.
1,309	196	0	52,981	8,656	0	1,309	0	196	0	April
1,352	262	0	52,100	7,139	0	1,352	0	262	0	May
1,309	309	0	50,537	4,190	0	1,309	0	309	0	June
1,352	359	0	48,919	2,560	0	1,352	0	359	0	July
1,352	325	0	47,208	2,910	0	1,352	0	325	0	Aug.
1,309	252	0	45,531	1,820	0	1,309	0	252	0	Sept.
1,352	186	0	43,970	2,070	0	1,352	0	186	0	Oct.
1,309	123	0	42,432	1,960	0	1,309	0	123	0	Nov.
1,352	0	0	41,000	2,870	0	1,352	0	0	0	Dec.
15,965	2,012	0		56,444	10,159	15,965	0	2,012	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1909									
Jan.	25,500	53,503	5,596	23,888	0	0	39,648	5,596	8,681
Feb.	59,400	49,519	8,440	42,858	0	0	49,519	8,440	41,897
Mar.	26,300	57,621	9,344	0	0	0	57,360	9,344	0
April	28,000	74,577	9,042	0	268	0	72,964	9,042	0
May	15,200	93,267	9,344	0	391	0	90,351	9,344	0
June	8,570	98,732	8,319	0	476	0	94,474	8,319	0
July	5,040	98,507	5,040	0	559	0	92,956	5,040	0
Aug.	3,120	97,948	3,120	0	520	0	91,067	3,120	0
Sept.	2,320	97,428	2,320	0	401	0	89,221	2,320	0
Oct.	2,310	97,027	2,310	0	305	0	87,535	2,310	0
Nov.	2,880	96,722	2,880	0	204	0	85,897	2,880	0
Dec.	20,900	96,518	6,346	38,233	0	0	84,400	6,346	24,763
Total or average	199,540		72,101	104,979	3,124	0		72,101	75,341
1910									
Jan.	69,500	72,839	9,344	82,868	0	0	72,839	9,344	81,516
Feb.	11,500	50,127	8,435	2,689	0	0	50,127	8,435	2,292
Mar.	9,590	50,503	9,029	0	0	0	49,678	9,029	0
April	8,270	51,064	8,120	0	190	0	48,887	8,120	0
May	5,050	51,024	5,050	0	262	0	47,542	5,050	0
June	3,560	50,762	3,560	0	311	0	45,940	3,560	0
July	2,450	50,451	2,450	0	369	0	44,340	2,450	0
Aug.	1,710	50,082	1,710	0	341	0	42,651	1,710	0
Sept.	1,370	49,741	1,370	0	264	0	40,992	1,370	0
Oct.	1,560	49,477	1,560	0	202	0	39,449	1,560	0
Nov.	1,870	49,275	1,870	0	133	0	37,923	1,870	0
Dec.	2,020	49,142	2,020	0	0	0	36,501	2,020	0
Total or average	118,450		54,518	85,557	2,072	0		54,518	83,808
1911									
Jan.	37,200	49,142	6,441	7,031	0	0	35,149	6,441	6,949
Feb.	44,300	72,870	8,440	54,016	0	0	57,607	8,440	38,010
Mar.	122,000	54,714	9,344	57,434	0	0	54,235	9,344	55,857
April	28,200	109,936	9,042	0	335	0	109,682	9,042	0
May	16,600	128,759	9,344	0	482	0	127,196	9,344	0
June	7,500	135,533	7,322	0	589	0	132,622	7,322	0
July	5,230	135,122	5,230	0	696	0	130,912	5,230	0
Aug.	3,610	134,426	3,610	0	644	0	128,884	3,610	0
Sept.	2,830	133,782	2,830	0	498	0	126,909	2,830	0
Oct.	3,140	133,284	3,140	0	379	0	125,124	3,140	0
Nov.	2,800	132,905	2,800	11,766	248	0	123,411	2,800	1,061
Dec.	2,870	120,891	2,870	23,312	0	0	120,803	2,870	22,352
Total or average	276,280		70,413	153,559	3,871	0		70,413	124,229

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE
ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			Flood control completely coordinated with conservation Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1909
1,352	0	0	39,648	5,596	8,681	1,352	0	0	0	Jan.
1,222	0	0	49,519	8,440	41,897	1,222	0	0	0	Feb.
1,352	0	0	57,360	9,344	0	1,352	0	0	0	Mar.
1,309	262	0	72,964	9,042	0	1,309	1,190	258	0	April
1,352	381	0	89,165	9,344	0	1,352	5,041	369	0	May
1,309	460	0	88,259	8,319	0	1,309	6,306	428	0	June
1,352	537	0	80,467	5,040	0	1,352	6,639	478	0	July
1,352	494	0	71,998	3,120	0	1,352	6,578	412	0	Aug.
1,309	377	0	63,656	2,320	0	1,309	6,365	295	0	Sept.
1,352	286	0	55,687	2,310	0	1,352	0	214	0	Oct.
1,309	188	0	54,121	2,880	0	1,309	0	139	0	Nov.
1,352	0	0	52,673	6,346	1,682	1,352	0	0	0	Dec.
15,922	2,985			72,101	52,260	15,922	32,119	2,593	0	Total or average
										1910
1,352	0	0	64,193	9,344	72,870	1,352	0	0	0	Jan.
1,222	0	0	50,127	8,435	2,292	1,222	0	0	0	Feb.
1,352	0	0	49,678	9,029	0	1,352	0	0	0	Mar.
1,309	186	0	48,887	8,120	0	1,309	0	186	0	April
1,352	250	0	47,542	5,050	0	1,352	0	250	0	May
1,309	291	0	45,940	3,560	0	1,309	0	291	0	June
1,352	337	0	44,340	2,450	0	1,352	0	337	0	July
1,352	307	0	42,651	1,710	0	1,352	0	307	0	Aug.
1,309	234	0	40,992	1,370	0	1,309	0	234	0	Sept.
1,352	174	0	39,449	1,560	0	1,352	0	174	0	Oct.
1,309	113	0	37,923	1,870	0	1,309	0	113	0	Nov.
1,352	0	0	36,501	2,020	0	1,352	0	0	0	Dec.
15,922	1,892	0		54,518	75,162	15,922	0	1,892	0	Total or average
										1911
1,352	0	0	35,149	6,441	6,949	1,352	0	0	0	Jan.
1,222	0	0	57,607	8,440	38,010	1,222	0	0	0	Feb.
1,352	0	0	54,235	9,344	55,857	1,352	0	0	0	Mar.
1,309	335	0	109,682	9,042	0	1,309	7,198	325	0	April
1,352	478	0	120,008	9,344	0	1,352	11,311	446	0	May
1,309	579	0	114,155	7,322	0	1,309	12,671	502	0	June
1,352	676	0	99,851	5,230	0	1,352	13,155	537	0	July
1,352	623	0	84,807	3,610	0	1,352	13,094	446	0	Aug.
1,309	476	0	69,915	2,830	0	1,309	12,612	306	0	Sept.
1,352	361	0	55,688	3,140	0	1,352	0	215	0	Oct.
1,309	238	0	54,121	2,800	0	1,309	0	139	0	Nov.
1,352	0	0	52,673	2,870	0	1,352	0	0	0	Dec.
15,922	3,766	0		70,413	100,816	15,922	70,041	2,916	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second-only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1912									
Jan.	2,710	97,579	2,710	0	0	0	97,099	2,710	0
Feb.	2,230	97,579	2,230	0	0	0	95,747	2,230	0
Mar.	22,900	97,579	8,199	3,590	0	0	94,482	8,199	496
April	18,000	108,690	8,515	0	319	0	107,335	8,515	0
May	10,900	117,856	8,828	0	454	0	115,196	8,828	0
June	4,990	119,474	4,990	0	539	0	115,474	4,990	0
July	3,060	118,935	3,060	0	637	0	113,640	3,060	0
Aug.	1,960	118,298	1,960	0	591	0	111,675	1,960	0
Sept.	1,550	117,707	1,550	0	454	0	109,758	1,550	0
Oct.	1,830	117,253	1,830	0	347	0	108,019	1,830	0
Nov.	1,730	116,906	1,730	0	232	0	106,340	1,730	0
Dec.	1,760	116,674	1,760	7,665	0	0	104,815	1,760	0
Total or average	73,620		47,362	11,255	3,573	0		47,362	496
1913									
Jan.	2,910	109,009	2,910	8,725	0	0	103,463	2,910	4,136
Feb.	13,200	100,284	4,753	27,773	0	0	97,975	4,753	24,767
Mar.	10,200	80,958	8,759	11,336	0	0	80,433	8,759	10,660
April	7,140	71,063	7,091	0	238	0	69,862	7,091	0
May	4,970	70,874	4,970	0	319	0	68,370	4,970	0
June	2,890	70,555	2,890	0	385	0	66,709	2,890	0
July	1,690	70,170	1,690	0	452	0	65,033	1,690	0
Aug.	1,070	69,718	1,070	0	418	0	63,255	1,070	0
Sept.	893	69,300	893	0	323	0	61,512	893	0
Oct.	910	68,977	910	0	246	0	59,906	910	0
Nov.	2,280	68,731	2,280	0	165	0	58,330	2,280	0
Dec.	2,170	68,566	2,170	0	0	0	56,874	2,170	0
Total or average	50,323		40,386	47,834	2,546	0		40,386	39,563
1914									
Jan.	61,400	68,566	6,271	56,127	0	0	55,522	6,271	47,159
Feb.	121,000	67,568	8,440	64,933	0	0	62,140	8,440	58,284
Mar.	48,000	115,195	9,344	53,083	0	0	115,194	9,344	52,388
April	21,400	100,768	9,042	0	307	0	100,110	9,042	0
May	16,900	112,819	9,344	0	430	0	110,854	9,344	0
June	9,580	119,945	8,585	0	535	0	116,630	8,585	0
July	5,570	120,405	5,570	0	641	0	115,786	5,570	0
Aug.	3,630	119,764	3,630	0	595	0	113,803	3,630	0
Sept.	2,730	119,169	2,730	0	458	0	111,879	2,730	0
Oct.	2,770	118,711	2,770	0	349	0	110,134	2,770	0
Nov.	2,440	118,362	2,440	0	234	0	108,451	2,440	0
Dec.	4,290	118,128	4,290	53,539	0	0	106,922	4,290	40,981
Total or average	299,710		72,456	227,682	3,549	0		72,456	198,812

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1912
1,352	0	0	51,321	2,710	0	1,352	0	0	0	Jan.
1,265	0	0	49,969	2,230	0	1,265	0	0	0	Feb.
1,352	0	0	48,704	8,190	0	1,352	0	0	0	Mar.
1,309	315	0	62,053	8,515	0	1,309	0	238	0	April
1,352	442	0	60,991	8,828	0	1,352	1,168	315	0	May
1,309	525	0	69,228	4,990	0	1,309	1,606	373	0	June
1,352	613	0	65,940	3,060	0	1,352	1,660	426	0	July
1,352	565	0	62,502	1,960	0	1,352	1,660	359	0	Aug.
1,309	430	0	59,131	1,550	0	1,309	1,667	291	0	Sept.
1,352	327	0	55,864	1,830	0	1,352	0	215	0	Oct.
1,309	216	0	54,297	1,730	0	1,309	0	139	0	Nov.
1,352	0	0	52,849	1,760	0	1,352	0	0	0	Dec.
15,965	3,433	0		47,362	0	15,965	7,761	2,356	0	Total or average
										1913
1,352	0	0	51,497	2,910	0	1,352	0	0	0	Jan.
1,222	0	0	50,145	4,753	0	1,222	0	0	0	Feb.
1,352	0	0	57,370	8,759	0	1,352	0	0	0	Mar.
1,309	232	0	57,459	7,091	0	1,309	0	206	0	April
1,352	309	0	55,993	4,970	0	1,352	0	274	0	May
1,309	367	0	54,367	2,890	0	1,309	0	321	0	June
1,352	426	0	52,737	1,690	0	1,352	0	375	0	July
1,352	391	0	51,010	1,070	0	1,352	0	340	0	Aug.
1,309	297	0	49,318	893	0	1,309	0	260	0	Sept.
1,352	224	0	47,749	910	0	1,352	0	196	0	Oct.
1,309	147	0	46,201	2,280	0	1,309	0	127	0	Nov.
1,352	0	0	44,765	2,170	0	1,352	0	0	0	Dec.
15,922	2,393	0		40,386	0	15,922	0	2,099	0	Total or average
										1914
1,352	0	0	43,413	6,271	35,050	1,352	0	0	0	Jan.
1,222	0	0	62,140	8,440	58,284	1,222	0	0	0	Feb.
1,352	0	0	115,194	9,344	52,388	1,352	0	0	0	Mar.
1,309	305	0	100,110	9,042	0	1,309	5,652	301	0	April
1,352	428	0	105,206	9,344	0	1,352	8,299	410	0	May
1,309	530	0	102,701	8,585	0	1,309	9,875	472	0	June
1,352	631	0	92,040	5,570	0	1,352	10,512	516	0	July
1,352	572	0	79,660	3,630	0	1,352	10,450	432	0	Aug.
1,309	436	0	67,426	2,730	0	1,309	10,113	301	0	Sept.
1,352	331	0	55,703	2,770	0	1,352	0	214	0	Oct.
1,309	220	0	54,137	2,440	0	1,309	0	139	0	Nov.
1,352	0	0	52,689	4,290	0	1,352	0	0	0	Dec.
15,922	3,453	0		72,456	145,722	15,922	54,901	2,785	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone — Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially — Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1915									
Jan.	7,380	64,589	4,428	9,932	0	0	64,589	4,428	8,659
Feb.	30,200	57,609	8,412	21,485	0	0	57,530	8,412	20,577
Mar.	21,500	57,912	9,344	0	0	0	57,519	9,344	0
April	17,300	70,068	9,042	0	238	0	68,323	9,042	0
May	20,400	78,088	9,344	0	369	0	75,034	9,344	0
June	11,400	88,775	8,967	0	476	0	84,395	8,967	0
July	7,010	90,732	7,010	0	529	0	85,085	7,010	0
Aug.	3,980	90,203	3,980	0	492	0	83,225	3,980	0
Sept.	3,270	89,711	3,270	0	381	0	81,409	3,270	0
Oct.	2,770	89,330	2,770	0	290	0	79,745	2,770	0
Nov.	3,010	89,040	3,010	0	192	0	78,125	3,010	0
Dec.	3,580	88,848	3,580	0	0	0	76,640	3,580	0
Total or average	131,800		73,157	31,417	2,967	0		73,157	29,236
1916									
Jan.	148,000	88,848	8,759	85,470	0	0	75,288	8,759	70,558
Feb.	39,400	142,619	8,741	101,672	0	0	142,619	8,741	100,407
Mar.	34,800	71,606	9,344	4,852	0	0	71,606	9,344	4,679
April	19,900	92,210	9,042	0	297	0	91,031	9,042	0
May	10,400	102,771	9,130	0	430	0	100,292	9,130	0
June	5,830	103,611	5,830	0	492	0	99,811	5,830	0
July	4,770	103,119	4,770	0	577	0	98,026	4,770	0
Aug.	3,570	102,542	3,570	0	535	0	96,119	3,570	0
Sept.	2,810	102,007	2,810	0	412	0	94,255	2,810	0
Oct.	7,010	101,595	6,473	0	307	0	92,555	6,473	0
Nov.	4,130	101,825	4,130	0	212	0	91,445	4,130	0
Dec.	13,600	101,613	5,253	46,759	0	0	89,940	5,253	33,734
Total or average	294,220		77,852	238,753	3,262	0		77,852	209,378
1917									
Jan.	9,280	63,201	8,172	14,791	0	0	63,201	8,172	13,501
Feb.	13,200	49,518	7,551	0	0	0	49,456	7,551	0
Mar.	13,600	55,167	9,344	0	0	0	53,883	9,344	0
April	10,500	59,423	9,042	0	212	0	56,787	9,042	0
May	8,610	60,669	8,531	0	288	0	56,728	8,531	0
June	5,270	60,460	5,270	0	347	0	55,179	5,270	0
July	3,140	60,113	3,140	0	410	0	53,543	3,140	0
Aug.	2,200	59,703	2,200	0	379	0	51,812	2,200	0
Sept.	1,510	59,324	1,510	0	293	0	50,115	1,510	0
Oct.	1,560	59,031	1,560	0	224	0	48,544	1,560	0
Nov.	1,840	58,807	1,840	0	149	0	46,994	1,840	0
Dec.	2,000	58,658	2,000	0	0	0	45,558	2,000	0
Total or average	72.710		60,160	14,791	2,302	0		60,160	13,501

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

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Maximum controlled flow at Azusa 1,900 second-feet.
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										1915
1,352	0	0	51,337	4,428	3,629	1,352	0	0	0	Jan.
1,222	0	0	49,308	8,412	12,355	1,222	0	0	0	Feb.
1,352	0	0	57,519	9,344	0	1,352	0	0	0	Mar.
1,309	238	0	68,323	9,042	0	1,309	416	238	0	April
1,352	343	0	74,618	9,344	0	1,352	2,090	341	0	May
1,309	434	0	81,891	8,967	0	1,309	4,759	414	0	June
1,352	508	0	77,842	7,010	0	1,352	5,717	468	0	July
1,352	464	0	70,305	3,980	0	1,352	5,717	407	0	Aug.
1,309	355	0	62,829	3,270	0	1,309	5,533	293	0	Sept.
1,352	268	0	55,694	2,770	0	1,352	0	214	0	Oct.
1,309	176	0	54,128	3,010	0	1,309	0	139	0	Nov.
1,352	0	0	52,680	3,580	0	1,352	0	0	0	Dec.
15,922	2,786	0		73,157	15,984	15,922	24,232	2,514	0	Total or average
										1916
1,352	0	0	51,328	8,759	51,935	1,352	0	0	0	Jan.
1,265	0	0	137,282	8,741	99,779	1,265	0	0	0	Feb.
1,352	0	0	66,897	9,344	603	1,352	0	0	0	Mar.
1,309	288	0	90,398	9,042	0	1,309	4,045	284	0	April
1,352	399	0	95,618	9,130	0	1,352	6,393	379	0	May
1,309	476	0	88,764	5,830	0	1,309	6,484	430	0	June
1,352	555	0	80,541	4,770	0	1,352	6,639	480	0	July
1,352	512	0	72,070	3,570	0	1,352	6,639	412	0	Aug.
1,309	391	0	63,667	2,810	0	1,309	6,425	295	0	Sept.
1,352	295	0	55,638	6,473	0	1,352	0	214	0	Oct.
1,309	196	0	54,609	4,130	0	1,309	0	131	0	Nov.
1,352	0	0	53,169	5,253	0	1,352	0	0	0	Dec.
15,965	3,112	0		77,852	152,317	15,965	36,625	2,625	0	Total or average
										1917
1,352	0	0	60,164	8,172	10,464	1,352	0	0	0	Jan.
1,222	0	0	49,456	7,551	0	1,222	0	0	0	Feb.
1,352	0	0	53,883	9,344	0	1,352	0	0	0	Mar.
1,309	208	0	56,787	9,042	0	1,309	0	208	0	April
1,352	276	0	56,728	8,531	0	1,352	0	276	0	May
1,309	327	0	55,179	5,270	0	1,309	0	327	0	June
1,352	379	0	53,543	3,140	0	1,352	0	379	0	July
1,352	345	0	51,812	2,200	0	1,352	0	345	0	Aug.
1,309	262	0	50,115	1,510	0	1,309	0	262	0	Sept.
1,352	198	0	48,544	1,560	0	1,352	0	198	0	Oct.
1,309	127	0	46,994	1,840	0	1,309	0	127	0	Nov.
1,352	0	0	45,558	2,000	0	1,352	0	0	0	Dec.
15,922	2,122	0		60,160	10,464	15,922	0	2,122	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1918									
Jan.	2,020	58,658	2,020	0	0	0	44,206	2,020	0
Feb.	9,330	58,658	3,847	0	0	0	42,854	3,847	0
Mar.	73,200	64,141	9,249	19,393	0	0	47,115	9,249	3,595
April	17.000	108,699	9,042	0	321	0	106,119	9,042	0
May	10,000	116,336	8,993	0	444	0	112,453	8,993	0
June	6,010	116,899	6,010	0	531	0	111,672	6,010	0
July	3,970	116,368	3,970	0	627	0	109,849	3,970	0
Aug.	2,840	115,741	2,840	0	581	0	107,896	2,840	0
Sept.	2,330	115,160	2,330	0	446	0	105,993	2,330	0
Oct.	2,930	114,714	2,930	0	341	0	104,264	2,930	0
Nov.	3,140	114,373	3,140	11,869	238	0	102,593	3,140	0
Dec.	4,370	102,266	4,370	29,745	0	0	101,072	4,370	27,459
Total or average	137,140		58,741	61,007	3,529	0		58,741	31,054
1919									
Jan.	3,300	72,521	3,300	0	0	0	72,261	3,300	0
Feb.	4,110	72,521	4,110	0	0	0	70,909	4,110	0
Mar.	6,110	72,521	6,110	0	0	0	69,687	6,110	0
April	6,010	72,521	6,010	0	238	0	68,335	6,010	0
May	3,810	72,283	3,810	0	323	0	66,796	3,810	0
June	1,890	71,960	1,890	0	387	0	65,139	1,890	0
July	1,320	71,573	1,320	0	458	0	63,469	1,320	0
Aug.	935	71,115	935	0	422	0	61,697	935	0
Sept.	1,010	70,693	1,010	0	327	0	59,960	1,010	0
Oct.	2,040	70,366	2,040	0	248	0	58,358	2,040	0
Nov.	2,130	70,118	2,130	0	165	0	56,784	2,130	0
Dec.	5,340	69,953	5,209	7,081	0	0	55,332	5,209	0
Total or average	38,005		37,874	7,081	2,568	0		37,874	0
1920									
Jan.	3,260	63,003	3,260	8,130	0	0	54,111	3,260	0
Feb.	12,700	54,873	5,854	885	0	0	52,759	5,854	0
Mar.	36,200	60,834	9,344	1,148	0	0	58,340	9,344	0
April	25,100	86,542	9,042	0	288	0	83,844	9,042	0
May	12,600	102,312	9,344	0	410	0	98,309	9,344	0
June	7,380	105,158	7,349	0	494	0	99,812	7,349	0
July	4,670	104,695	4,670	0	583	0	98,058	4,670	0
Aug.	3,200	104,112	3,200	0	541	0	96,151	3,200	0
Sept.	2,030	103,571	2,030	0	416	0	94,287	2,030	0
Oct.	2,000	103,155	2,000	0	317	0	92,587	2,000	0
Nov.	2,380	102,838	2,380	358	214	0	90,940	2,380	0
Dec.	2,210	102,266	2,210	30,538	0	0	89,437	2,210	16,619
Total or average	113,730		60,683	41,059	3,263	0		60,683	16,619

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation Jeet maintained, other drafts reservoir operating diagram			Flood control completely coordinated with conservation Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							Year and month
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	
										1918
1,352	0	0	44,206	2,020	0	1,352	0	0	0	Jan.
1,222	0	0	42,854	3,847	0	1,222	0	0	0	Feb.
1,352	0	0	47,115	9,249	3,595	1,352	0	0	0	Mar.
1,309	315	0	106,119	9,042	0	1,309	6,603	307	0	April
1,352	436	0	105,858	8,993	0	1,352	8,422	412	0	May
1,309	514	0	96,679	6,010	0	1,309	8,388	454	0	June
1,352	601	0	86,528	3,970	0	1,352	8,668	496	0	July
1,352	551	0	76,012	2,840	0	1,352	8,606	422	0	Aug.
1,309	420	0	65,632	2,330	0	1,309	8,329	297	0	Sept.
1,352	319	0	55,697	2,930	0	1,352	0	214	0	Oct.
1,309	212	0	54,131	3,140	0	1,309	0	139	0	Nov.
1,352	0	0	52,683	4,370	0	1,352	0	0	0	Dec.
15,922	3,368	0		58,741	3,595	15,922	49,016	2,741	0	Total or average
										1919
1,352	0	0	51,331	3,300	0	1,352	0	0	0	Jan.
1,222	0	0	49,979	4,110	0	1,222	0	0	0	Feb.
1,352	0	0	48,757	6,110	0	1,352	0	0	0	Mar.
1,309	230	0	47,405	6,010	0	1,309	0	182	0	April
1,352	305	0	45,914	3,810	0	1,352	0	244	0	May
1,309	361	0	44,318	1,890	0	1,309	0	284	0	June
1,352	420	0	42,725	1,320	0	1,352	0	329	0	July
1,352	385	0	41,044	935	0	1,352	0	299	0	Aug.
1,309	293	0	39,393	1,010	0	1,309	0	230	0	Sept.
1,352	222	0	37,854	2,040	0	1,352	0	171	0	Oct.
1,309	143	0	36,331	2,130	0	1,309	0	109	0	Nov.
1,352	0	0	34,913	5,209	0	1,352	0	0	0	Dec.
15,922	2,359	0		37,874	0	15,922	0	1,848	0	Total or average
										1920
1,352	0	0	33,692	3,260	0	1,352	0	0	0	Jan.
1,265	0	0	32,340	5,854	0	1,265	0	0	0	Feb.
1,352	0	0	37,921	9,344	0	1,352	0	0	0	Mar.
1,309	284	0	63,425	9,042	0	1,309	0	236	0	April
1,352	401	0	77,938	9,344	0	1,352	2,766	339	0	May
1,309	476	0	76,737	7,349	0	1,309	3,510	395	0	June
1,352	555	0	71,554	4,670	0	1,352	3,565	446	0	July
1,352	512	0	66,191	3,200	0	1,352	3,627	395	0	Aug
1,309	391	0	60,817	2,030	0	1,309	3,510	290	0	Sept.
1,352	295	0	55,708	2,000	0	1,352	0	214	0	Oct.
1,309	194	0	54,142	2,380	0	1,309	0	139	0	Nov
1,352	0	0	52,694	2,210	0	1,352	0	0	0	Dec.
15,965	3,108	0		60,683	0	15,965	16,978	2,454	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR USE OF RES

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second-only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1921									
Jan.	5,160	71,728	4,405	19,991	0	0	71,466	4,405	18,459
Feb.	4,490	52,492	4,490	0	0	0	52,410	4,490	0
Mar.	15,400	52,492	7,288	0	0	0	51,188	7,288	0
April	6,070	60,604	6,070	0	214	0	57,948	6,070	0
May	15,700	60,390	6,835	0	295	0	56,433	6,835	0
June	8,980	68,960	7,920	0	379	0	63,664	7,920	0
July	3,830	69,641	3,830	0	450	0	63,054	3,830	0
Aug.	2,450	69,191	2,450	0	416	0	61,284	2,450	0
Sept.	1,840	68,775	1,840	0	323	0	59,549	1,840	0
Oct.	2,040	68,452	2,040	0	244	0	57,947	2,040	0
Nov.	1,800	68,208	1,800	0	163	0	56,375	1,800	0
Dec.	119,000	68,045	5,045	42,364	0	0	54,923	5,045	41,740
Total or average	186,760		54,013	62,355	2,484	0		54,013	60,199
1922									
Jan.	62,100	139,636	9,344	108,684	0	0	125,786	9,344	107,332
Feb.	88,900	83,708	8,440	98,166	0	0	69,858	8,440	83,316
Mar.	47,800	66,002	9,344	3,576	0	0	65,780	9,344	2,882
April	31,400	100,882	9,042	0	321	0	100,002	9,042	0
May	24,700	122,919	9,344	0	482	0	120,734	9,344	0
June	14,400	137,793	9,042	0	605	0	134,264	9,042	0
July	9,100	142,546	8,576	0	720	0	137,722	8,576	0
Aug.	5,080	142,350	5,080	0	670	0	136,194	5,080	0
Sept.	3,290	141,680	3,290	0	516	0	134,196	3,290	0
Oct.	3,110	141,164	3,110	0	393	0	132,391	3,110	0
Nov.	5,310	140,771	4,519	37,066	246	0	130,664	4,519	25,655
Dec.	21,500	104,250	8,456	54,093	0	0	104,249	8,456	52,740
Total or average	316,690		87,587	301,585	3,953	0		87,587	271,925
1923									
Jan.	7,130	63,201	6,968	13,408	0	0	63,201	6,968	12,056
Feb.	7,830	49,955	7,791	0	0	0	49,955	7,791	0
Mar.	7,320	49,994	7,320	0	0	0	48,772	7,320	0
April	8,330	49,994	8,079	0	190	0	47,420	8,079	0
May	5,480	50,055	5,480	0	258	0	46,180	5,480	0
June	3,700	49,797	3,700	0	309	0	44,584	3,700	0
July	2,420	49,488	2,420	0	363	0	42,987	2,420	0
Aug.	1,990	49,125	1,990	0	337	0	41,304	1,990	0
Sept.	1,750	48,788	1,750	0	262	0	39,653	1,750	0
Oct.	1,710	48,526	1,710	0	198	0	38,112	1,710	0
Nov.	1,960	48,328	1,960	0	131	0	36,589	1,960	0
Dec.	2,130	48,197	2,130	0	0	0	35,169	2,130	0
Total or average	51,750		51,298	13,408	2,048	0		51,298	12,056

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE
ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1921
1,352	0	0	51,342	4,405	0	1,352	0	0	0	Jan.
1,222	0	0	50,745	4,490	0	1,222	0	0	0	Feb.
1,352	0	0	49,523	7,288	0	1,352	0	0	0	Mar.
1,309	206	0	56,283	6,070	0	1,309	0	204	0	April
1,352	282	0	54,770	6,835	0	1,352	0	281	0	May
1,309	361	0	62,002	7,920	0	1,309	0	354	0	June
1,352	418	0	61,399	3,830	0	1,352	184	413	0	July
1,352	383	0	59,450	2,450	0	1,352	184	378	0	Aug.
1,309	293	0	57,536	1,840	0	1,309	238	286	0	Sept.
1,352	220	0	55,703	2,040	0	1,352	0	214	0	Oct.
1,309	143	0	54,137	1,800	0	1,309	0	139	0	Nov.
1,352	0	0	52,689	5,045	39,506	1,352	0	0	0	Dec.
15,922	2,306	0		54,013	39,506	15,922	606	2,269	0	Total or average
										1922
1,352	0	0	125,786	9,344	107,332	1,352	0	0	0	Jan.
1,222	0	0	69,858	8,440	83,316	1,222	0	0	0	Feb.
1,352	0	0	65,780	9,344	2,882	1,352	0	0	0	Mar.
1,309	317	0	100,002	9,042	0	1,309	5,652	311	0	April
1,352	474	0	115,088	9,344	0	1,352	10,327	446	0	May
1,309	591	0	118,319	9,042	0	1,309	13,742	522	0	June
1,352	700	0	108,104	8,576	0	1,352	15,922	565	0	July
1,352	646	0	90,789	5,080	0	1,352	16,106	464	0	Aug.
1,309	496	0	72,867	3,290	0	1,309	15,527	307	0	Sept.
1,352	375	0	55,724	3,110	0	1,352	0	214	0	Oct.
1,309	242	0	54,158	4,519	0	1,309	0	141	0	Nov.
1,352	0	0	53,499	8,456	1,990	1,352	0	0	0	Dec.
15,922	3,841	0		87,587	195,520	15,922	77,276	2,970	0	Total or average
										1923
1,352	0	0	63,201	6,968	12,056	1,352	0	0	0	Jan.
1,222	0	0	49,955	7,791	0	1,222	0	0	0	Feb.
1,352	0	0	48,772	7,320	0	1,352	0	0	0	Mar.
1,309	182	0	47,420	8,079	0	1,309	0	182	0	April
1,352	244	0	46,180	5,480	0	1,352	0	244	0	May
1,309	288	0	44,584	3,700	0	1,309	0	288	0	June
1,352	331	0	42,987	2,420	0	1,352	0	331	0	July
1,352	299	0	41,304	1,990	0	1,352	0	299	0	Aug.
1,309	232	0	39,653	1,750	0	1,309	0	232	0	Sept.
1,352	171	0	38,112	1,710	0	1,352	0	171	0	Oct.
1,309	111	0	36,589	1,960	0	1,309	0	111	0	Nov.
1,352	0	0	35,169	2,130	0	1,352	0	0	0	Dec.
15,922	1,858	0		51,298	12,056	15,922	0	1,858	0	Total or average

TABLE 16a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR USE OF RES

Monthly Summary of Computa

(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
1924									
Jan.	2,170	48,197	2,170	0	0	0	33,817	2,170	0
Feb.	1,790	48,197	1,790	0	0	0	32,465	1,790	0
Mar.	4,130	48,197	3,714	0	0	0	31,200	3,714	0
April	6,190	48,613	6,190	0	188	0	30,264	6,190	0
May	3,650	48,425	3,650	0	252	0	28,814	3,650	0
June	1,660	48,173	1,660	0	303	0	27,276	1,660	0
July	1,000	47,870	1,000	0	359	0	25,753	1,000	0
Aug.	756	47,511	756	0	329	0	24,153	756	0
Sept.	744	47,182	744	0	256	0	22,579	744	0
Oct.	873	46,926	873	0	196	0	21,103	873	0
Nov.	1,190	46,730	1,190	0	129	0	19,628	1,190	0
Dec.	1,780	46,601	1,780	0	0	0	18,240	1,780	0
Total or average	25,933		25,517	0	2,012	0		25,517	0
1925									
Jan.	1,710	46,601	1,710	0	0	0	16,888	1,710	0
Feb.	1,620	46,601	1,620	0	0	0	15,536	1,620	0
Mar.	2,510	46,601	2,423	0	0	0	14,314	2,423	0
April	7,200	46,688	5,765	0	184	0	13,049	5,765	0
May	3,050	47,939	3,050	0	252	0	13,086	3,050	0
June	1,840	47,687	1,840	0	295	0	11,629	1,840	0
July	824	47,392	824	0	349	0	10,189	824	0
Aug.	621	47,043	621	0	329	0	8,696	621	0
Sept.	492	46,714	492	0	254	0	7,227	492	0
Oct.	873	46,460	873	0	194	0	5,837	873	0
Nov.	1,010	46,266	1,010	0	127	0	4,433	1,010	0
Dec.	1,650	46,139	1,650	0	0	0	3,096	1,650	0
Total or average	23,400		21,878	0	1,984	0		21,878	0
1926									
Jan.	1,540	46,139	1,540	0	0	0	1,744	1,540	0
Feb.	7,940	46,139	5,485	0	0	0	392	5,485	0
Mar.	3,650	48,594	3,650	0	0	0	1,625	3,650	0
April	69,000	48,594	8,233	0	274	0	273	8,233	0
May	13,000	109,087	9,142	0	434	0	59,572	9,142	0
June	5,500	112,511	5,500	0	520	0	61,785	5,500	0
July	3,120	111,991	3,120	0	611	0	60,127	3,120	0
Aug.	2,070	111,380	2,070	0	567	0	58,367	2,070	0
Sept.	1,580	110,813	1,580	0	436	0	56,642	1,580	0
Oct.		110,377					55,049		
Nov.									
Dec.									
Total or average	107,400		40,320	0	2,842	0		40,320	0

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE ERVOIR SPACE.

tions Carried Out on a Daily Basis.

mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			**Flood control completely coordinated with conservation** Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
										1924
1,352	0	0	33,817	2,170	0	1,352	0	0	0	Jan.
1,265	0	0	32,465	1,790	0	1,265	0	0	0	Feb.
1,352	0	0	31,200	3,714	0	1,352	0	0	0	Mar.
1,309	141	0	30,264	6,190	0	1,309	0	141	0	April
1,352	186	0	28,814	3,650	0	1,352	0	186	0	May
1,309	214	0	27,276	1,660	0	1,309	0	214	0	June
1,352	248	0	25,753	1,000	0	1,352	0	248	0	July
1,352	222	0	24,153	756	0	1,352	0	222	0	Aug.
1,309	167	0	22,579	744	0	1,309	0	167	0	Sept.
1,352	123	0	21,103	873	0	1,352	0	123	0	Oct.
1,309	79	0	19,628	1,190	0	1,309	0	79	0	Nov.
1,352	0	0	18,240	1,780	0	1,352	0	0	0	Dec.
15,965	1,380	0		25,517	0	15,965	0	1,380	0	Total or average
										1925
1,352	0	0	16,888	1,710	0	1,352	0	0	0	Jan.
1,222	0	0	15,536	1,620	0	1,222	0	0	0	Feb.
1,352	0	0	14,314	2,423	0	1,352	0	0	0	Mar.
1,309	89	0	13,049	5,765	0	1,309	0	89	0	April
1,352	105	0	13,086	3,050	0	1,352	0	105	0	May
1,309	131	0	11,629	1,840	0	1,309	0	131	0	June
1,352	141	0	10,189	824	0	1,352	0	141	0	July
1,352	117	0	8,696	621	0	1,352	0	117	0	Aug.
1,309	81	0	7,227	492	0	1,309	0	81	0	Sept.
1,352	52	0	5,837	873	0	1,352	0	52	0	Oct.
1,309	28	0	4,433	1,010	0	1,309	0	28	0	Nov.
1,352	0	0	3,096	1,650	0	1,352	0	0	0	Dec.
15,922	744	0		21,878	0	15,922	0	744	0	Total or average
										1926
1,352	0	0	1,744	1,540	0	1,352	0	0	0	Jan.
1,222	0	0	392	5,485	0	1,222	0	0	0	Feb.
1,352	0	0	1,625	3,650	0	1,352	0	0	0	Mar.
1,309	159	0	273	8,233	0	1,309	0	159	0	April
1,352	293	0	59,572	9,142	0	1,352	0	293	0	May
1,309	349	0	61,785	5,500	0	1,309	0	349	0	June
1,352	408	0	60,127	3,120	0	1,352	0	408	0	July
1,352	373	0	58,367	2,070	0	1,352	0	373	0	Aug.
1,309	284	0	56,642	1,580	0	1,309	0	284	0	Sept.
			55,049							Oct.
										Nov.
										Dec.
11,909	1,866	0		40,320	0	11,909	0	1,866	0	Total or average

TABLE 16a (Concluded). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
USE OF RES
Monthly Summary of Computa
(For corresponding yearly sum

Height of dam 383 feet.
Capacity of reservoir 180,000 acre-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Flood control alone. Water drawn from reservoir only as required by reservoir operating diagram					Flood control partially. Constant draft of 22 second- only as required by		
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet
Total for period, Jan. 1, 1897, to Oct. 1, 1926	**3,731,977**		**1,513,303**	**[a]2,076,091**	**87,430**	**7,426**		**1,513,303**	**1,672,152**
Average for period, Jan. 1, 1897, to Oct. 1, 1926	**125,445**		**50,867**	**[a]69,785**	**2,939**	**250**		**50,867**	**[b]56,207**

[a] In the computations for this table the period of analysis closed with 47,727 acre-feet more water in storage than at the beginning, the equivalent of 1604 acre-feet per season. Since in the computations this water was stored in the last year of the period of analysis, the exact yield of flood control water for the period is greater than here shown by this amount.

RESERVOIR ON SAN GABRIEL RIVER.

THREE STEPS IN COORDINATING THE
ERVOIR SPACE.
tions Carried Out on a Daily Basis.
mary, see Table 16, page 182.)

Maximum controlled flow at Azusa 1,900 second-feet.
Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

coordinated with conservation feet maintained, other drafts reservoir operating diagram			Flood control completely coordinated with conservation Reservoir emptied each summer to a level that would maintain constant draft through critical period; constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram							
Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Variable summer draft from seasonally stored water in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
473,905	**76,867**	**3,351**		**1,513,303**	[b]**1,010,662**	**473,905**	**676,322**	**65,386**	**0**	**Total for period, Jan. 1, 1897, to Oct. 1, 1926**
15,930	**2,584**	**113**		**50,867**	[b]**33,972**	**15,930**	**22,734**	**2,198**	**0**	**Average for period, Jan. 1, 1897, to Oct. 1, 1926**

[b] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period, of analysis. In the computations from which this table is prepared, the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period, is less than here shown by this amount.

TABLE 17a. SAN GABRIEL RESER

COMPARISON OF WATER YIELD FOR FOR FLOOD CONTROL AND

Monthly Summary of Computa

(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1897							
Jan.	3,617	62,650	3,617	11,779	1,352	0	0
Feb.	19,146	49,519	7,262	4,628	1,222	0	0
Mar	28,623	55,553	9,344	0	1,352	0	0
April	17,519	73,480	9,042	0	1,309	235	0
May	8,851	80,413	8,126	0	1,352	353	0
June	4,033	79,433	4,033	0	1,309	412	0
July	2,343	77,712	2,343	0	1,352	485	0
Aug.	1,613	75,875	1,613	0	1,352	440	0
Sept.	1,226	74,083	1,226	0	1,309	337	0
Oct.	5,564	72,437	2,622	0	1,352	258	0
Nov.	1,860	73,769	1,860	0	1,309	171	0
Dec.	1,875	72,289	1,875	0	1,352	0	0
Total or average	96,270		52,963	16,407	15,922	2,691	0
1898							
Jan.	2,453	70,937	2,453	10,849	1,352	0	0
Feb.	2,241	58,736	2,241	0	1,222	0	0
Mar.	2,131	57,514	2,131	0	1,352	0	0
April	1,950	56,162	1,950	0	1,309	202	0
May	2,213	54,651	2,213	0	1,352	270	0
June	1,159	53,029	1,159	0	1,309	325	0
July	672	51,395	672	0	1,352	369	0
Aug.	456	49,674	456	0	1,352	337	0
Sept.	467	47,985	467	0	1,309	256	0
Oct.	533	46,420	533	0	1,352	192	0
Nov.	580	44,876	580	0	1,309	125	0
Dec.	832	43,442	832	0	1,352	0	0
Total or average	15,687		15,687	10,849	15,922	2,076	0
1899							
Jan.	1,414	42,090	1,414	0	1,352	0	0
Feb.	1,244	40,738	1,244	0	1,222	0	0
Mar.	1,623	39,516	1,623	0	1,352	0	0
April	1,262	38,164	1,262	0	1,309	161	0
May	842	36,694	842	0	1,352	214	0
June	565	35,128	565	0	1,309	248	0
July	221	33,571	221	0	1,352	288	0
Aug.	295	31,931	295	0	1,352	260	0
Sept.	220	30,319	220	0	1,309	198	0
Oct.	683	28,812	683	0	1,352	147	0
Nov	847	27,313	847	0	1,309	91	0
Dec.	1,247	25,913	1,247	0	1,352	0	0
Total or average	10,463		10,463	0	15,922	1,607	0
1900							
Jan.	1,968	24,561	1,968	0	1,352	0	0
Feb.	1,111	23,209	1,111	0	1,222	0	0
Mar.	1,230	21,987	1,230	0	1,352	0	0
April	1,012	20,635	1,012	0	1,309	115	0
May	2,275	19,211	2,275	0	1,352	147	0
June	893	17,712	893	0	1,309	180	0
July	369	16,223	369	0	1,352	192	0
Aug.	246	14,679	246	0	1,352	169	0
Sept.	238	13,158	238	0	1,309	121	0
Oct.	307	11,728	307	0	1,352	95	0
Nov.	11,068	10,281	1,058	0	1,309	59	0
Dec.	1,269	18,923	1,269	0	1,352	0	0
Total or average	21,986		11,976	0	15,922	1,078	0

VOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING
CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1897
122,650	3,617	10,611	2,520	0	0	Jan.
109,519	7,262	4,478	2,276	0	0	Feb.
114,649	9,344	0	2,520	0	0	Mar.
131,408	9,042	0	2,439	363	0	April
137,083	8,126	0	2,520	494	0	May
134,794	4,033	0	2,439	583	0	June
131,772	2,343	0	2,520	674	0	July
128,578	1,613	0	2,520	621	0	Aug.
125,437	1,226	0	2,439	472	0	Sept.
122,526	2,622	0	2,520	357	0	Oct.
122,591	1,860	0	2,439	238	0	Nov.
119,914	1,875	0	2,520	0	0	Dec.
	52,963	15,089	29,672	3,802	0	Total or average
						1898
117,394	2,453	0	2,520	0	0	Jan.
114,874	2,241	0	2,276	0	0	Feb.
112,598	2,131	0	2,520	0	0	Mar.
110,078	1,950	0	2,439	313	0	April
107,326	2,213	0	2,520	410	0	May
104,396	1,159	0	2,439	490	0	June
101,467	672	0	2,520	565	0	July
98,382	456	0	2,520	516	0	Aug.
95,346	467	0	2,439	391	0	Sept
92,516	533	0	2,520	293	0	Oct.
89,703	580	0	2,439	192	0	Nov.
87,072	832	0	2,520	0	0	Dec.
	15,687	0	29,672	3,170	0	Total or average
						1899
84,552	1,414	0	2,520	0	0	Jan.
82,032	1,244	0	2,276	0	0	Feb.
79,756	1,623	0	2,520	0	0	Mar.
77,236	1,262	0	2,439	246	0	April
74,551	842	0	2,520	325	0	May
71,706	565	0	2,439	383	0	June
68,884	221	0	2,520	440	0	July
65,924	295	0	2,520	399	0	Aug.
63,005	220	0	2,439	301	0	Sept.
60,265	683	0	2,520	224	0	Oct.
57,521	847	0	2,439	143	0	Nov.
54,939	1,247	0	2,520	0	0	Dec.
	10,463	0	29,672	2,461	0	Total o average
						1900
52,419	1,968	0	2,520	0	0	Jan.
49,899	1,111	0	2,276	0	0	Feb.
47,623	1,230	0	2,520	0	0	Mar.
45,103	1,012	0	2,439	176	0	April
42,488	2,275	0	2,520	230	0	May
39,738	893	0	2,439	264	0	June
37,035	369	0	2,520	299	0	July
34,216	246	0	2,520	268	0	Aug.
31,428	238	0	2,439	200	0	Sept.
28,789	307	0	2,520	145	0	Oct.
26,124	1,058	0	2,439	95	0	Nov.
33,600	1,269	0	2,520	0	0	Dec.
	11,976	0	29,672	1,677	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1901							
Jan.	10,391	17,571	6,661	0	1,352	0	0
Feb.	38,709	19,949	8,350	0	1,222	0	0
Mar.	13,589	49,086	9,138	0	1,352	0	0
April	6,545	52,185	6,545	0	1,309	192	0
May	7,440	50,684	6,990	0	1,352	260	0
June	3,749	49,522	3,749	0	1,309	305	0
July	1,845	47,908	1,845	0	1,352	353	0
Aug.	1,240	46,203	1,240	0	1,352	321	0
Sept.	1,012	44,530	1,012	0	1,309	246	0
Oct.	1,476	42,975	1,476	0	1,352	184	0
Nov.	1,904	41,439	1,904	0	1,309	115	0
Dec.	1,660	40,015	1,660	0	1,352	0	0
Total or average	89,560		50,570	0	15,922	1,976	0
1902							
Jan.	1,722	38,663	1,722	0	1,352	0	0
Feb.	2,055	37,311	2,055	0	1,222	0	0
Mar.	6,088	36,089	5,590	0	1,352	0	0
April	3,928	35,235	3,928	0	1,309	153	0
May	2,398	33,773	2,398	0	1,352	204	0
June	1,190	32,217	1,190	0	1,309	236	0
July	676	30,672	676	0	1,352	272	0
Aug.	430	29,048	430	0	1,352	246	0
Sept.	298	27,450	298	0	1,309	186	0
Oct.	430	25,955	430	0	1,352	139	0
Nov.	1,131	24,464	1,131	0	1,309	87	0
Dec.	1,968	23,068	1,968	0	1,352	0	0
Total or average	22,314		21,816	0	15,922	1,523	0
1903							
Jan.	9,100	21,716	2,536	0	1,352	0	0
Feb.	5,665	26,928	5,497	0	1,222	0	0
Mar.	15,802	25,874	7,898	0	1,352	0	0
April	47,127	32,426	9,042	0	1,309	208	0
May	13,343	68,994	9,116	0	1,352	323	0
June	5,653	71,546	5,653	0	1,309	385	0
July	2,644	69,852	2,644	0	1,352	446	0
Aug.	1,783	68,054	1,783	0	1,352	410	0
Sept.	1,488	66,292	1,488	0	1,309	313	0
Oct.	1,476	64,670	1,476	0	1,352	236	0
Nov.	1,428	63,082	1,428	0	1,309	155	0
Dec.	1,476	61,618	1,476	0	1,352	0	0
Total or average	106,985		50,037	0	15,922	2,476	0
1904							
Jan.	1,500	60,266	1,500	0	1,352	0	0
Feb.	2,744	58,914	2,177	0	1,265	0	0
Mar.	6,813	58,216	4,724	0	1,352	0	0
April	5,337	58,953	5,337	0	1,309	208	0
May	4,089	57,436	4,089	0	1,352	280	0
June	1,517	55,804	1,517	0	1,309	329	0
July	861	54,166	861	0	1,352	383	0
Aug.	793	52,431	793	0	1,352	349	0
Sept.	643	50,730	643	0	1,309	266	0
Oct.	738	49,155	738	0	1,352	206	0
Nov.	762	47,597	762	0	1,309	133	0
Dec.	1,039	46,155	1,039	0	1,352	0	0
Total or average	26,836		24,180	0	15,965	2,154	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1901
31,080	6,661	0	2,520	0	0	Jan.
32,290	8,350	0	2,276	0	0	Feb.
60,373	9,138	0	2,520	0	0	Mar.
62,304	6,545	0	2,439	214	0	April
59,651	6,990	0	2,520	284	0	May
57,297	3,749	0	2,439	331	0	June
54,527	1,845	0	2,520	381	0	July
51,626	1,240	0	2,520	341	0	Aug.
48,765	1,012	0	2,439	256	0	Sept.
46,070	1,476	0	2,520	188	0	Oct.
43,362	1,904	0	2,439	121	0	Nov.
40,802	1,660	0	2,520	0	0	Dec.
	50,570	0	29,672	2,116	0	Total or average
						1902
38,282	1,722	0	2,520	0	0	Jan.
35,762	2,055	0	2,276	0	0	Feb.
33,486	5,590	0	2,520	0	0	Mar.
31,464	3,928	0	2,439	143	0	April
28,882	2,398	0	2,520	182	0	May
26,180	1,190	0	2,439	208	0	June
23,533	676	0	2,520	232	0	July
20,781	430	0	2,520	202	0	Aug
18,059	298	0	2,439	145	0	Sept.
15,475	430	0	2,520	99	0	Oct.
12,856	1,131	0	2,439	58	0	Nov.
10,359	1,968	0	2,520	0	0	Dec.
	21,816	0	29,672	1,269	0	Total or average
						1903
7,839	2,536	0	2,520	0	0	Jan.
11,883	5,487	0	2,276	0	0	Feb.
9,775	7,898	0	2,520	0	0	Mar.
15,159	9,042	0	2,439	171	0	April
50,634	9,116	0	2,520	268	0	May
52,073	5,653	0	2,439	311	0	June
49,323	2,644	0	2,520	359	0	July
46,444	1,783	0	2,520	321	0	Aug.
43,603	1,488	0	2,439	240	0	Sept.
40,924	1,476	0	2,520	176	0	Oct.
38,228	1,428	0	2,439	113	0	Nov.
35,676	1,476	0	2,520	0	0	Dec.
	50,037	0	29,672	1,959	0	Total or average
						1904
33,156	1,500	0	2,520	0	0	Jan.
30,636	2,177	0	2,358	0	0	Feb.
28,845	4,724	0	2,520	0	0	Mar.
28,414	5,337	0	2,439	135	0	April
25,840	4,089	0	2,520	173	0	May
23,147	1,517	0	2,439	194	0	June
20,514	861	0	2,520	216	0	July
17,778	793	0	2,520	184	0	Aug.
15,074	643	0	2,439	129	0	Sept.
12,506	738	0	2,520	87	0	Oct.
9,899	762	0	2,439	50	0	Nov.
7,410	1,039	0	2,520	0	0	Dec.
	24,180	0	29,754	1,168	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram: Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1905							
Jan.	2,251	44,803	2,251	0	1,352	0	0
Feb.	25,880	43,451	8,206	6,204	1,222	0	0
Mar.	75,140	53,699	9,281	16,231	1,352	0	0
April	19,580	101,975	9,042	0	1,309	311	0
May	17,090	110,893	9,344	0	1,352	438	0
June	8,271	116,849	7,960	0	1,309	529	0
July	5,103	115,322	5,103	0	1,352	621	0
Aug.	2,631	113,349	2,631	0	1,352	571	0
Sept.	1,869	111,426	1,869	0	1,309	436	0
Oct.	1,770	109,681	1,770	0	1,352	329	0
Nov.	2,660	108,000	2,660	3,610	1,309	220	0
Dec.	2,470	102,861	2,470	6,944	1,352	0	0
Total or average	164,715		62,587	32,989	15,922	3,455	0
1906							
Jan.	4,240	94,565	3,533	33,608	1,352	0	0
Feb.	3,960	60,212	3,960	0	1,222	0	0
Mar.	129,000	58,990	7,561	30,250	1,352	0	0
April	34,600	148,827	9,042	20,735	1,309	381	0
May	21,000	151,960	9,344	0	1,352	541	0
June	15,500	161,723	9,042	0	1,309	674	0
July	9,350	166,198	8,664	0	1,352	803	0
Aug.	4,490	164,729	4,490	0	1,352	738	0
Sept.	2,840	162,639	2,840	0	1,309	567	0
Oct.	2,450	160,763	2,450	0	1,352	430	0
Nov.	2,400	158,981	2,400	5,941	1,309	286	0
Dec.	11,600	151,445	4,030	94,462	1,352	0	0
Total or average	241,430		67,456	184,996	15,922	4,420	0
1907							
Jan.	58,400	63,201	9,217	56,159	1,352	0	0
Feb.	47,100	54,873	8,439	29,904	1,222	0	0
Mar.	116,000	62,408	9,344	45,814	1,352	0	0
April	58,400	121,898	9,042	453	1,309	391	0
May	21,500	169,103	9,344	0	1,352	585	0
June	15,100	179,322	9,042	0	1,309	720	3,351
July	8,360	180,000	7,920	0	1,352	847	0
Aug.	5,390	178,241	5,390	0	1,352	781	0
Sept.	3,580	176,108	3,580	0	1,309	599	0
Oct.	4,090	174,200	4,090	3,106	1,352	450	0
Nov.	3,800	169,292	3,800	53,565	1,309	254	0
Dec.	3,600	114,164	3,600	12,164	1,352	0	0
Total or average	345,320		82,808	201,165	15,922	4,627	3,351
1908							
Jan.	11,100	100,648	4,973	24,273	1,352	0	0
Feb.	15,000	81,150	8,741	35,256	1,265	0	0
Mar.	12,700	50,888	9,255	0	1,352	0	0
April	9,280	52,981	8,656	0	1,309	196	0
May	7,190	52,100	7,139	0	1,352	262	0
June	4,190	50,537	4,190	0	1,309	309	0
July	2,560	48,919	2,560	0	1,352	359	0
Aug.	2,210	47,208	2,210	0	1,352	325	0
Sept.	1,820	45,531	1,820	0	1,309	252	0
Oct.	2,070	43,970	2,070	0	1,352	186	0
Nov.	1,960	42,432	1,960	0	1,309	123	0
Dec.	2,870	41,000	2,870	0	1,352	0	0
Total or average	72,950		56,444	59,529	15,965	2,012	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING
CONSTANT DRAFT ONLY.
tions Carried out on a Daily Basis.
mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1905
4,890	2,251	0	2,520	0	0	Jan.
2,370	8,206	0	2,276	0	0	Feb.
17,768	9,281	0	2 520	0	0	Mar.
81,107	9,042	0	2,439	268	0	April
88,938	9,344	0	2,520	377	0	May
93,787	7,960	0	2,439	464	0	June
91,195	5,103	0	2,520	527	0	July
88,148	2,631	0	2,520	482	0	Aug.
85,146	1,869	0	2,439	365	0	Sept.
82,342	1,770	0	2,520	272	0	Oct.
79,550	2,660	0	2,439	176	0	Nov.
76,935	2,470	0	2,520	0	0	Dec.
	62,587	0	29,672	2,931	0	Total or average
						1906
74,415	3,633	0	2,520	0	0	Jan.
72,502	3,960	0	2,276	0	0	Feb.
70,226	7,561	9,428	2,520	0	0	Mar.
179,717	9,042	0	2,439	468	0	April
202,368	9,344	0	2,520	658	0	May
210,846	9,042	0	2,439	815	0	June
214,050	8,664	0	2,520	960	0	July
211,256	4,490	0	2,520	882	0	Aug.
207,854	2,840	0	2,439	672	0	Sept.
204,743	2,450	0	2,520	510	0	Oct.
201,713	2,406	0	2,439	335	0	Nov.
198,939	4,030	80,788	2,520	0	0	Dec.
	67,456	90,216	29,672	5,300	0	Total or average
						1907
123,201	9,217	54,991	2,520	0	0	Jan
114,873	8,439	28,878	2,276	0	0	Feb.
122,380	9,344	44,618	2,520	0	0	Mar.
181,898	9,042	360	2,439	496	0	April
227,961	9,344	0	2,520	724	0	May
236,873	9,042	0	2,439	886	0	June
239,606	7,920	0	2,520	1,047	0	July
236,479	5,390	0	2,520	958	0	Aug.
233,001	3,580	0	2,439	736	0	Sept
229,826	4,090	0	2,520	557	0	Oct.
226,749	3,800	49,817	2,439	329	0	Nov.
174,164	3,600	11,787	2,520	0	0	Dec.
	82,808	190,451	29,672	5,733	0	Total or average
						1908
159,857	4,973	24,010	2,520	0	0	Jan.
139,454	8,741	33,168	2,358	0	0	Feb.
110,187	9,255	0	2,520	0	0	Mar.
111,112	8,656	0	2,439	317	0	April
108,980	7,439	0	2,520	420	0	May
106,091	4,190	0	2,439	494	0	June
103,158	2,560	0	2,520	573	0	July
100,065	2,210	0	2,520	524	0	Aug.
97,021	1,820	0	2,439	397	0	Sept.
94,185	2,070	0	2,520	297	0	Oct.
91,368	1,960	0	2,439	194	0	Nov.
88,735	2,870	0	2,520	0	0	Dec.
	56,444	57,178	29,754	3,216	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1909							
Jan.	25,500	39,648	5,596	8,681	1,352	0	0
Feb.	59,400	49,519	8,440	41,897	1,222	0	0
Mar.	26,300	57,360	9,344	0	1,352	0	0
April	28,000	72,964	9,042	0	1,309	262	0
May	15,200	90,351	9,344	0	1,352	381	0
June	8,570	94,474	8,319	0	1,309	460	0
July	5,040	92,956	5,040	0	1,352	537	0
Aug.	3,120	91,067	3,120	0	1,352	494	0
Sept.	2,320	89,221	2,320	0	1,309	377	0
Oct.	2,310	87,535	2,310	0	1,352	286	0
Nov.	2,880	85,897	2,880	0	1,309	188	0
Dec.	20,900	84,400	6,346	24,763	1,352	0	0
Total or average	199,540		72,101	75,341	15,922	2,985	0
1910							
Jan.	69,500	72,839	9,344	81,516	1,352	0	0
Feb.	11,500	50,127	8,435	2,292	1,222	0	0
Mar.	9,590	49,678	9,029	0	1,352	0	0
April	8,270	48,887	8,120	0	1,309	186	0
May	5,050	47,542	5,050	0	1,352	250	0
June	3,560	45,940	3,560	0	1,309	291	0
July	2,450	44,340	2,450	0	1,352	337	0
Aug.	1,710	42,651	1,710	0	1,352	307	0
Sept.	1,370	40,992	1,370	0	1,309	234	0
Oct.	1,560	39,449	1,560	0	1,352	174	0
Nov.	1,870	37,923	1,870	0	1,309	113	0
Dec.	2,020	36,501	2,020	0	1,352	0	0
Total or average	118,450		54,518	83,808	15,922	1,892	0
1911							
Jan.	37,200	35,149	6,441	6,949	1,352	0	0
Feb.	44,300	57,607	8,440	38,010	1,222	0	0
Mar.	122,000	54,235	9,344	55,857	1,352	0	0
April	28,200	109,682	9,042	0	1,309	335	0
May	16,600	127,196	9,344	0	1,352	478	0
June	7,500	132,622	7,322	0	1,309	579	0
July	5,230	130,912	5,230	0	1,352	676	0
Aug.	3,610	128,884	3,610	0	1,352	623	0
Sept	2,830	126,909	2,830	0	1,309	476	0
Oct.	3,140	125,124	3,140	0	1,352	361	0
Nov.	2,800	123,411	2,800	1,061	1,309	238	0
Dec.	2,870	120,803	2,870	22,352	1,352	0	0
Total or average	276,280		70,413	124,229	15,922	3,766	0
1912							
Jan.	2,710	97,099	2,710	0	1,352	0	0
Feb.	2,230	95,747	2,230	0	1,265	0	0
Mar.	22,900	94,482	8,199	496	1,352	0	0
April	18,000	107,335	8,515	0	1,309	315	0
May	10,900	115,196	8,828	0	1,352	442	0
June	4,990	115,474	4,990	0	1,309	525	0
July	3,060	113,640	3,060	0	1,352	613	0
Aug.	1,960	111,675	1,960	0	1,352	565	0
Sept.	1,550	109,758	1,550	0	1,309	430	0
Oct.	1,830	108,019	1,830	0	1,352	327	0
Nov.	1,730	106,340	1,730	0	1,309	216	0
Dec.	1,760	104,815	1,760	0	1,352	0	0
Total or average	73,620		47,362	496	15,965	3,433	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING
CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1909
86,215	5,596	0	2,520	0	0	Jan.
103,599	8,440	35,296	2,276	0	0	Feb.
116,987	9,344	0	2,520	0	0	Mar.
131,423	9,042	0	2,439	375	0	April
147,567	9,344	0	2,520	525	0	May
150,378	8,319	0	2,439	631	0	June
147,559	5,040	0	2,520	734	0	July
144,305	3,120	0	2,520	672	0	Aug.
141,113	2,320	0	2,439	512	0	Sept.
138,162	2,310	0	2,520	385	0	Oct.
135,257	2,880	0	2,439	254	0	Nov.
132,564	6,346	11,759	2,520	0	0	Dec.
	72,101	47,055	29,672	4,088		Total or average
						1910
132,839	9,344	80,362	2,520	0	0	Jan.
110,113	8,435	1,945	2,276	0	0	Feb.
108,957	9,029	0	2,520	0	0	Mar.
106,998	8,120	0	2,439	307	0	April
104,402	5,050	0	2,520	407	0	May
101,475	3,560	0	2,439	478	0	June
98,558	2,450	0	2,520	555	0	July
95,483	1,710	0	2,520	506	0	Aug.
92,457	1,370	0	2,439	385	0	Sept.
89,633	1,560	0	2,520	288	0	Oct.
86,825	1,870	0	2,439	188	0	Nov.
84,198	2,020	0	2,520	0	0	Dec.
	54,518	82,307	29,672	3,114	0	Total or average
						1911
81,678	6,441	0	2,520	0	0	Jan.
109,917	8,440	29,679	2,276	0	0	Feb.
113,822	9,344	55,275	2,520	0	0	Mar.
168,683	9,042	0	2,439	438	0	April
184,964	9,344	0	2,520	617	0	May
189,083	7,322	0	2,439	740	0	June
186,082	5,230	0	2,520	865	0	July
182,697	3,610	0	2,520	793	0	Aug.
179,384	2,830	0	2,439	607	0	Sept.
176,338	3,140	0	2,520	458	0	Oct.
173,360	2,800	0	2,439	301	0	Nov.
170,620	2,870	11,071	2,520	0	0	Dec.
	70,413	96,025	29,672	4,819	0	Total or average
						1912
157,029	2,710	0	2,520	0	0	Jan.
154,509	2,230	0	2,358	0	0	Feb.
152,151	8,199	0	2,520	0	0	Mar.
164,332	8,515	0	2,439	420	0	April
170,958	8,828	0	2,520	575	0	May
169,935	4,990	0	2,439	686	0	June
166,810	3,060	0	2,520	799	0	July
163,491	1,960	0	2,520	734	0	Aug.
160,237	1,550	0	2,439	557	0	Sept.
157,241	1,830	0	2,520	420	0	Oct.
154,301	1,730	0	2,439	280	0	Nov.
151,582	1,760	0	2,520	0	0	Dec.
	47,362	0	29,754	4,471	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For orre ponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1913							
Jan.	2,910	103,463	2,910	4,136	1,352	0	0
Feb.	13,200	97,975	4,753	24,767	1,222	0	0
Mar.	10,200	80,433	8,759	10,660	1,352	0	0
April	7,140	69,862	7,091	0	1,309	232	0
May	4,970	68,370	4,970	0	1,352	309	0
June	2,890	66,709	2,890	0	1,309	367	0
July	1,690	65,033	1,690	0	1,352	426	0
Aug.	1,070	63,255	1,070	0	1,352	391	0
Sept.	893	61,512	893	0	1,309	297	0
Oct.	910	59,906	910	0	1,352	224	0
Nov.	2,280	58,330	2,280	0	1,309	147	0
Dec.	2,170	56,874	2,170	0	1,352	0	0
Total or average	50,323		40,386	39,563	15,922	2,393	0
1914							
Jan.	61,400	55,522	6,271	47,159	1,352	0	0
Feb.	121,000	62,140	8,440	58,284	1,222	0	0
Mar.	48,000	115,194	9,344	52,388	1,352	0	0
April	21,400	100,110	9,042	0	1,309	305	0
May	16,900	110,854	9,344	0	1,352	428	0
June	9,580	116,630	8,585	0	1,309	530	0
July	5,570	115,786	5,570	0	1,352	631	0
Aug.	3,630	113,803	3,630	0	1,352	572	0
Sept.	2,730	111,879	2,730	0	1,309	436	0
Oct.	2,770	110,134	2,770	0	1,352	331	0
Nov.	2,440	108,451	2,440	0	1,309	220	0
Dec.	4,290	106,922	4,290	40.981	1,352	0	0
Total or average	299,710		72,456	198,812	15,922	3,453	0
1915							
Jan.	7,380	64,589	4,428	8,659	1,352	0	0
Feb.	30,200	57,530	8,412	20,577	1,222	0	0
Mar.	21,500	57,519	9,344	0	1,352	0	0
April	17,300	68,323	9,042	0	1,309	238	0
May	20,400	75,034	9,344	0	1,352	343	0
June	11,400	84,395	8,967	0	1,309	434	0
July	7,010	85,085	7,010	0	1,352	508	0
Aug.	3,980	83,225	3,980	0	1,352	464	0
Sept.	3,270	81,409	3,270	0	1,309	355	0
Oct.	2,770	79,745	2,770	0	1,352	268	0
Nov.	3,010	78,125	3,010	0	1,309	176	0
Dec.	3,580	76,640	3,580	0	1,352	0	0
Total or average	131,800		73,157	29,236	15,922	2,786	0
1916							
Jan.	148,000	75,288	8,759	70,558	1,352	0	0
Feb.	39,400	142,619	8,741	100,407	1,265	0	0
Mar.	34,800	71,606	9,344	4,679	1,352	0	0
April	19,900	91,031	9,042	0	1,309	288	0
May	10,400	100,292	9,130	0	1,352	399	0
June	5,830	99,811	5,830	0	1,309	476	0
July	4,770	98,026	4,770	0	1,352	555	0
Aug.	3,570	96,119	3,570	0	1,352	512	0
Sept.	2,810	94,255	2,810	0	1,309	391	0
Oct.	7,010	92,555	6,473	0	1,352	295	0
Nov.	4,130	91,445	4,130	0	1,309	196	0
Dec.	13,600	89,940	5,253	33,734	1,352	0	0
Total or average	294,220		77,852	209,378	15,965	3,112	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1913
149,062	2,910	0	2,520	0	0	Jan.
146,542	4,753	16,941	2,276	0	0	Feb.
135,772	8,759	7,782	2,520	0	0	Mar.
126,911	7,091	0	2,439	345	0	April
124,176	4,970	0	2,520	460	0	May
121,196	2,890	0	2,439	541	0	June
118,216	1,690	0	2,520	629	0	July
115,067	1,070	0	2,520	575	0	Aug.
111,972	893	0	2,439	436	0	Sept.
109,097	910	0	2,520	327	0	Oct.
106,250	2,280	0	2,439	216	0	Nov.
103,595	2,170	0	2,520	0	0	Dec.
	40,386	24,723	29,672	3,529	0	Total or average
						1914
101,075	6,271	31,544	2,520	0	0	Jan.
122,140	8,440	57,228	2,276	0	0	Feb.
175,196	9,344	51,782	2,520	0	0	Mar.
159,550	9,042	0	2,439	424	0	April
169,045	9,344	0	2,520	579	0	May
173,502	8,585	0	2,439	696	0	June
171,362	5,570	0	2,520	815	0	July
168,027	3,630	0	2,520	746	0	Aug.
164,761	2,730	0	2,439	569	0	Sept.
161,753	2,770	0	2,520	430	0	Oct.
158,803	2,440	0	2,439	284	0	Nov.
156,080	4,290	28,967	2,520	0	0	Dec.
	72,456	169,521	29,672	4,543	0	Total or average
						1915
124,593	4,428	8,211	2,520	0	0	Jan.
116,814	8,412	19,214	2,276	0	0	Feb.
117,112	9,344	0	2,520	0	0	Mar.
126,748	9,042	0	2,439	353	0	April
132,214	9,344	0	2,520	494	0	May
140,256	8,967	0	2,439	603	0	June
139,647	7,010	0	2,520	704	0	July
136,423	3,980	0	2,520	644	0	Aug.
133,259	3,270	0	2,439	492	0	Sept.
130,328	2,770	0	2,520	369	0	Oct.
127,439	3,010	0	2,439	244	0	Nov.
124,756	3,580	0	2,520	0	0	Dec.
	73,157	27,425	29,672	3,903	0	Total or average
						1916
122,236	8,759	56,341	2,520	0	0	Jan.
202,616	8,741	99,326	2,358	0	0	Feb.
131,591	9,344	4,593	2,520	0	0	Mar.
149,934	9,042	0	2,439	399	0	April
157,954	9,130	0	2,520	545	0	May
156,159	5,830	0	2,439	646	0	June
153,074	4,770	0	2,520	752	0	July
149,802	3,570	0	2,520	690	0	Aug.
146,592	2,810	0	2,439	525	0	Sept.
143,628	6,473	0	2,520	395	0	Oct.
141,250	4,130	0	2,439	264	0	Nov.
138,547	5,253	21,173	2,520	0	0	Dec.
	77,852	181,433	29,754	4,216	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.
Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1917							
Jan.	9,280	63,201	8,172	13,501	1,352	0	0
Feb.	13,200	49,456	7,551	0	1,222	0	0
Mar.	13,600	53,883	9,344	0	1,352	0	0
April	10,500	56,787	9,042	0	1,309	208	0
May	8,610	56,728	8,531	0	1,352	276	0
June	5,270	55,179	5,270	0	1,309	327	0
July	3,140	53,543	3,140	0	1,352	379	0
Aug.	2,200	51,812	2,200	0	1,352	345	0
Sept.	1,510	50,115	1,510	0	1,309	262	0
Oct.	1,560	48,544	1,560	0	1,352	198	0
Nov.	1,840	46,994	1,840	0	1,309	127	0
Dec.	2,000	45,558	2,000	0	1,352	0	0
Total or average	72,710		60,160	13,501	15,922	2,122	0
1918							
Jan.	2,020	44,206	2,020	0	1,352	0	0
Feb.	9,330	42,854	3,847	0	1,222	0	0
Mar.	73,200	47,115	9,249	3,595	1,352	0	0
April	17,000	106,119	9,042	0	1,309	315	0
May	10,000	112,453	8,993	0	1,352	436	0
June	6,010	111,672	6,010	0	1,309	514	0
July	3,970	109,849	3,970	0	1,352	601	0
Aug.	2,840	107,896	2,840	0	1,352	551	0
Sept.	2,330	105,993	2,330	0	1,309	420	0
Oct.	2,930	104,264	2,930	0	1,352	319	0
Nov.	3,140	102,593	3,140	0	1,309	212	0
Dec.	4,370	101,072	4,370	27,459	1,352	0	0
Total or average	137,140		58,741	31,054	15,922	3,368	0
1919							
Jan.	3,300	72,261	3,300	0	1,352	0	0
Feb.	4,110	70,909	4,110	0	1,222	0	0
Mar.	6,110	69,687	6,110	0	1,352	0	0
April	6,010	68,335	6,010	0	1,309	230	0
May	3,810	66,796	3,810	0	1,352	305	0
June	1,890	65,139	1,890	0	1,309	361	0
July	1,320	63,469	1,320	0	1,352	420	0
Aug.	935	61,697	935	0	1,352	385	0
Sept.	1,010	59,960	1,010	0	1,309	293	0
Oct.	2,040	58,358	2,040	0	1,352	222	0
Nov.	2,130	56,784	2,130	0	1,309	143	0
Dec.	5,340	55,332	5,209	0	1,352	0	0
Total or average	38,005		37,874	0	15,922	2,359	0
1920							
Jan.	3,260	54,111	3,260	0	1,352	0	0
Feb.	12,700	52,759	5,854	0	1,265	0	0
Mar.	36,200	58,340	9,344	0	1,352	0	0
April	25,100	83,844	9,042	0	1,309	284	0
May	12,600	98,309	9,344	0	1,352	401	0
June	7,380	99,812	7,349	0	1,309	476	0
July	4,670	98,058	4,670	0	1,352	555	0
Aug.	3,200	96,151	3,200	0	1,352	512	0
Sept.	2,030	94,287	2,030	0	1,309	391	0
Oct.	2,000	92,587	2,000	0	1,352	295	0
Nov.	2,380	90,940	2,380	0	1,309	194	0
Dec.	2,210	89,437	2,210	16,619	1,352	0	0
Total or average	113,730		60,683	16,619	15,965	3,108	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1917
123,201	8,172	12,270	2,520	0	0	Jan.
109,519	7,551	0	2,276	0	0	Feb.
112,892	9,344	0	2,520	0	0	Mar.
114,628	9,042	0	2,439	325	0	April
113,322	8,531	0	2,520	432	0	May
110,449	5,270	0	2,439	508	0	June
107,502	3,140	0	2,520	589	0	July
104,393	2,200	0	2,520	539	0	Aug.
101,334	1,510	0	2,439	408	0	Sept.
98,487	1,560	0	2,520	305	0	Oct.
95,662	1,840	0	2,439	202	0	Nov.
93,021	2,000	0	2,520	0	0	Dec.
	60,160	12,270	29,672	3,308	0	Total or average
						1918
90,501	2,020	0	2,520	0	0	Jan.
87,981	3,847	0	2,276	0	0	Feb.
91,188	9,249	0	2,520	0	0	Mar.
152,619	9,042	0	2,439	403	0	April
157,735	8,993	0	2,520	543	0	May
155,679	6,010	0	2,439	644	0	June
152,596	3,970	0	2,520	752	0	July
149,324	2,840	0	2,520	688	0	Aug.
146,116	2,330	0	2,439	525	0	Sept.
143,152	2,930	0	2,520	395	0	Oct.
140,237	3,140	0	2,439	262	0	Nov.
137,536	4,370	2,982	2,520	0	0	Dec.
	58,741	2,982	29,672	4,212	0	Total or average
						1919
132,034	3,300	0	2,520	0	0	Jan.
129,514	4,110	0	2,276	0	0	Feb.
127,238	6,110	0	2,520	0	0	Mar.
124,718	6,010	0	2,439	341	0	April
121,938	3,810	0	2,520	454	0	May
118,964	1,890	0	2,439	533	0	June
115,992	1,320	0	2,520	621	0	July
112,851	935	0	2,520	567	0	Aug.
109,764	1,010	0	2,439	430	0	Sept
106,895	2,040	0	2,520	323	0	Oct.
104,052	2,130	0	2,439	212	0	Nov.
101,401	5,209	0	2,520	0	0	Dec.
	37,874	0	29,672	3,481	0	Total or average
						1920
99,012	3,260	0	2,520	0	0	Jan.
96,492	5,854	0	2,358	0	0	Feb.
100,980	9,344	0	2,520	0	0	Mar.
125,316	9,042	0	2,439	361	0	April
138,574	9,344	0	2,520	500	0	May
138,810	7,349	0	2,439	595	0	June
135,807	4,670	0	2,520	690	0	July
132,597	3,200	0	2,520	633	0	Aug.
129,444	2,030	0	2,439	480	0	Sept.
126,525	2,000	0	2,520	363	0	Oct.
123,642	2,380	0	2,439	238	0	Nov.
120,965	2,210	0	2,520	0	0	Dec.
	60,683	0	29,754	3,860	0	Total or average

TABLE 17a (Continued). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram: Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1921							
Jan.	5,160	71,466	4,405	18,459	1,352	0	0
Feb.	4,490	52,410	4,490	0	1,222	0	0
Mar.	15,400	51,188	7,288	0	1,352	0	0
April	6,070	57,948	6,070	0	1,309	206	0
May	15,700	56,433	6,835	0	1,352	282	0
June	8,980	63,664	7,920	0	1,309	361	0
July	3,830	63,054	3,830	0	1,352	418	0
Aug.	2,450	61,284	2,450	0	1,352	383	0
Sept.	1,840	59,549	1,840	0	1,309	293	0
Oct.	2,040	57,947	2,040	0	1,352	220	0
Nov.	1,800	56,375	1,800	0	1,309	143	0
Dec.	119,000	54,923	5,045	41,740	1,352	0	0
Total or average	186,760		54,013	60,199	15,922	2,306	0
1922							
Jan.	62,100	125,786	9,344	107,332	1,352	0	0
Feb.	88,900	69,858	8,440	83,316	1,222	0	0
Mar.	47,800	65,780	9,344	2,882	1,352	0	0
April	31,400	100,002	9,042	0	1,309	317	0
May	24,700	120,734	9,344	0	1,352	474	0
June	14,400	134,264	9,042	0	1,309	591	0
July	9,100	137,722	8,576	0	1,352	700	0
Aug.	5,080	136,194	5,080	0	1,352	646	0
Sept.	3,290	134,196	3,290	0	1,309	496	0
Oct.	3,110	132,391	3,110	0	1,352	375	0
Nov.	5,310	130,664	4,519	25,655	1,309	242	0
Dec.	21,500	104,249	8,456	52,740	1,352	0	0
Total or average	316,690		87,587	271,925	15,922	3,841	0
1923							
Jan.	7,130	63,201	6,968	12,056	1,352	0	0
Feb.	7,830	49,955	7,791	0	1,222	0	0
Mar.	7,320	48,772	7,320	0	1,352	0	0
April	8,330	47,420	8,079	0	1,309	182	0
May	5,480	46,180	5,480	0	1,352	244	0
June	3,700	44,584	3,700	0	1,309	288	0
July	2,420	42,987	2,420	0	1,352	331	0
Aug.	1,990	41,304	1,990	0	1,352	299	0
Sept.	1,750	39,653	1,750	0	1,309	232	0
Oct.	1,710	38,112	1,710	0	1,352	171	0
Nov.	1,960	36,589	1,960	0	1,309	111	0
Dec.	2,130	35,169	2,130	0	1,352	0	0
Total or average	51,750		51,298	12,056	15,922	1,858	0
1924							
Jan.	2,170	33,817	2,170	0	1,352	0	0
Feb.	1,790	32,465	1,790	0	1,265	0	0
Mar.	4,130	31,200	3,714	0	1,352	0	0
April	6,190	30,264	6,190	0	1,309	141	0
May	3,650	28,814	3,650	0	1,352	186	0
June	1,660	27,276	1,660	0	1,309	214	0
July	1,000	25,753	1,000	0	1,352	248	0
Aug.	756	24,153	756	0	1,352	222	0
Sept.	744	22,579	744	0	1,309	167	0
Oct.	873	21,103	873	0	1,352	123	0
Nov.	1,190	19,628	1,190	0	1,309	79	0
Dec.	1,780	18,240	1,780	0	1,352	0	0
Total or average	25,933		25,517	0	15,965	1,380	0

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING
CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet
Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operatng diagram

Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1921
118,445	4,405	4,431	2,520	0	0	Jan.
112,249	4,490	0	2,276	0	0	Feb.
109,973	7,288	0	2,520	0	0	Mar.
115,565	6,070	0	2,439	325	0	April
112,801	6,835	0	2,520	436	0	May
118,710	7,920	0	2,439	533	0	June
116,798	3,830	0	2,520	623	0	July
113,655	2,450	0	2,520	569	0	Aug.
110,566	1,840	0	2,439	432	0	Sept.
107,695	2,040	0	2,520	325	0	Oct.
104,850	1,800	0	2,439	214	0	Nov.
102,197	5,045	31,012	2,520	0	0	Dec.
	54,013	35,443	29,672	3,457	0	Total or average
						1922
182,620	9,344	105,595	2,520	0	0	Jan.
127,261	8,440	79,666	2,276	0	0	Feb.
125,779	9,344	2,562	2,520	0	0	Mar.
159,153	9,042	0	2,439	424	0	April
178,648	9,344	0	2,520	611	0	May
190,873	9,042	0	2,439	752	0	June
193,040	8,576	0	2,520	894	0	July
190,150	5,080	0	2,520	815	0	Aug.
186,815	3,290	0	2,439	623	0	Sept.
183,753	3,110	0	2,520	470	0	Oct.
180,763	4,519	14,559	2,439	307	0	Nov.
164,249	8,456	51,572	2,520	0	0	Dec.
	87,587	253,954	29,672	4,896		Total or average
						1923
123,201	6,968	10,928	2,520	0	0	Jan.
109,915	7,791	0	2,276	0	0	Feb.
107,678	7,320	0	2,520	0	0	Mar.
105,158	8,079	0	2,439	305	0	April
102,665	5,480	0	2,520	403	0	May
99,742	3,700	0	2,439	474	0	June
96,829	2,420	0	2,520	549	0	July
93,760	1,990	0	2,520	500	0	Aug.
90,740	1,750	0	2,439	379	0	Sept.
87,922	1,710	0	2,520	288	0	Oct.
85,114	1,960	0	2,439	186	0	Nov.
82,489	2,130	0	2,520	0	0	Dec.
	51,298	10,928	29,672	3,084	0	Total or average
						1924
79,969	2,170	0	2,520	0	0	Jan.
77,449	1,790	0	2,358	0	0	Feb.
75,091	3,714	0	2,520	0	0	Mar.
72,987	6,190	0	2,439	238	0	April
70,310	3,650	0	2,520	315	0	May
67,475	1,660	0	2,439	369	0	June
64,667	1,000	0	2,520	426	0	July
61,721	756	0	2,520	385	0	Aug.
58,816	744	0	2,439	290	0	Sept.
56,087	873	0	2,520	214	0	Oct.
53,353	1,190	0	2,439	139	0	Nov.
50,775	1,780	0	2,520	0	0	Dec.
	25,517	0	29,754	2,376	0	Total or average

TABLE 17a (Concluded). SAN GABRIEL

COMPARISON OF WATER YIELD FOR
FOR FLOOD CONTROL AND
Monthly Summary of Computa
(For corresponding yearly sum

Maximum controlled flow at Azusa 1,900 second-feet.

Natural flow up to 152 second-

Year and month	Run-off at Azusa in acre-feet	Height of dam, 383 feet. Capacity of reservoir, 180,000 acre-feet. Constant draft of 22 second-feet maintained, other drafts only as required by reservoir operating diagram					
		Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (22 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet
1925							
Jan.	1,710	16,888	1,710	0	1,352	0	0
Feb.	1,620	15,536	1,620	0	1,222	0	0
Mar.	2,510	14,314	2,423	0	1,352	0	0
April	7,200	13,049	5,765	0	1,309	89	0
May	3,050	13,086	3,050	0	1,352	105	0
June	1,840	11,629	1,840	0	1,309	131	0
July	824	10,189	824	0	1,352	141	0
Aug.	621	8,696	621	0	1,352	117	0
Sept.	492	7,227	492	0	1,309	81	0
Oct.	873	5,837	873	0	1,352	52	0
Nov.	1,010	4,433	1,010	0	1,309	28	0
Dec.	1,650	3,096	1,650	0	1,352	0	0
Total or average	23,400		21,878	0	15,922	744	0
1926							
Jan.	1,540	1,744	1,540	0	1,352	0	0
Feb.	7,940	392	5,485	0	1,222	0	0
Mar.	3,650	1,625	3,650	0	1,352	0	0
April	69,000	273	8,233	0	1,309	159	0
May	13,000	59,572	9,142	0	1,352	293	0
June	5,500	61,785	5,500	0	1,309	349	0
July	3,120	60,127	3,120	0	1,352	408	0
Aug.	2,070	58,367	2,070	0	1,352	373	0
Sept.	1,580	56,642	1,580	0	1,309	284	0
Oct.		55,049					
Nov.							
Dec.							
Total or average	107,400		40,320	0	11,909	1,866	0
Total for period, Jan. 1, 1897, to Oct. 1, 1926	**3,731,977**		**1,513,303**	**[a]1,672,152**	**473,905**	**76,867**	**3,351**
Average for period, Jan. 1, 1897, to Oct. 1, 1926	**125,445**		**50,867**	**[a]56,207**	**15,930**	**2,584**	**113**

[a] These figures contain 7601 acre-feet total or an average of 256 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared, the water in storage is less by this amount than on January 1, 1897, the beginning of the period. Since in the computations this water was released as flood control water during the first flood season of the period, the exact yield of flood control water for the period is less than here shown by this amount.

RESERVOIR ON SAN GABRIEL RIVER.

TWO SIZES OF RESERVOIR OPERATING
CONSTANT DRAFT ONLY.

tions Carried out on a Daily Basis.

mary, see Table 17, page 184.)

Maximum flood control reserve 131,000 acre-feet.

feet passed for prior rights.

Height of dam, 425 feet. Capacity of reservoir, 240,000 acre-feet. Constant draft of 41 second-feet maintained, other drafts only as required by reservoir operating diagram						
Stage of reservoir at beginning of month in acre-feet	Passed by dam for prior rights in acre-feet	Flood control water passing Azusa during flood season at rates less than 1,900 second-feet in acre-feet	Constant draft from over-year storage (41 second-feet) in acre-feet	Evaporation from reservoir surface in acre-feet	Waste over spillway in acre-feet	Year and month
						1925
48,255	1,710	0	2,520	0	0	Jan.
45,735	1,620	0	2,276	0	0	Feb.
43,459	2,423	0	2,520	0	0	Mar.
41,026	5,765	0	2,439	171	0	April
39,851	3,050	0	2,520	222	0	May
37,109	1,840	0	2,439	254	0	June
34,416	824	0	2,520	288	0	July
31,608	621	0	2,520	256	0	Aug.
28,832	492	0	2,439	188	0	Sept.
26,205	873	0	2,520	137	0	Oct.
23,548	1,010	0	2,439	85	0	Nov.
21,024	1,650	0	2,520	0	0	Dec.
	21,878	0	29,672	1,601	0	Total or average
						1923
18,504	1,540	0	2,520	0	0	Jan.
15,984	5,485	0	2,276	0	0	Feb.
16,163	3,650	0	2,520	0	0	Mar.
13,643	8,233	0	2,439	196	0	April
71,775	9,142	0	2,520	325	0	May
72,788	5,500	0	2,439	385	0	June
69,964	3,120	0	2,520	442	0	July
67,002	2,070	0	2,520	403	0	Aug.
64,079	1,580	0	2,439	303	0	Sept.
61,337						Oct.
						Nov.
						Dec.
	40,320	0	22,193	2,054	0	Total or average
	1,513,303	**[b]1,297,000**	**[b]883,173**	**99,814**	**0**	**Total for period, Jan. 1, 1897, to Oct. 1, 1926**
	50,867	**[b]43,597**	**[b]29,686**	**3,355**	**0**	**Average for period, June 1, 1897, to Oct. 1, 1926**

[b] These figures contain 61,313 acre-feet total or an average of 2060 acre-feet per season of water contributed from outside the exact period of analysis. In the computations from which this table is prepared the water in storage on October 1, 1926, the end of the period, is less by this amount than on January 1, 1897, the beginning of the period. A supplementary analysis, having the same amount of water in storage at the beginning and at the end of the period was made to obtain the exact yield for the period. This gave 47,900 and 23,300 acre-feet per season respectively for the flood control water and uniformly continuous flow instead of 43,597 and 29,686 acre-feet respectively that are shown herein.

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PUBLICATIONS OF THE DEPARTMENT OF PUBLIC WORKS. DIVISION OF ENGINEERING AND IRRIGATION.

Bulletin No. 1—California Irrigation District Laws, 1921 (Obsolete).

*Bulletin No. 2—Formation of Irrigation Districts, Issuance of Bonds by Irrigation Districts, Expenditure of Construction Funds, etc.

Bulletin No. 3—Water Resources of Tulare County and their Utilization, 1922.

Bulletin No. 4—Water Resources of California.

Bulletin No. 5—Flow in California Streams.

Bulletin No. 6—Irrigation Requirements of California Lands.

Bulletin No. 7—California Irrigation District Laws, 1923 (Obsolete).

*Bulletin No. 8—Cost of Water to Irrigators in California.

Bulletin No. 9—Supplemental Report on Water Resources of California.

Bulletin No. 10—California Irrigation District Laws, 1925 (Obsolete).

Bulletin No. 11—Ground Water Resources of the Southern San Joaquin Valley.

Bulletin No. 12—Summary Report on the Water Resources of California and a Coordinated Plan for Their Development.

Bulletin No. 13—The Development of the Upper Sacramento River.

Bulletin No. 14—The Control of Floods by Reservoirs.

Bulletin No. 18—California Irrigation District Laws, 1927.

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PUBLICATIONS OF THE STATE DEPARTMENT OF ENGINEERING.

*Bulletin No. 1—Progress Report of Cooperative Irrigation Investigations in California, 1912–1914.

*Bulletin No. 2—Irrigation Districts in California, 1887–1915 (†).

Bulletin No. 3—Investigations of the Economic Duty of Water for Alfalfa in Sacramento Valley, California, 1915.

*Bulletin No. 4—Preliminary Report on Conservation and Control of Flood Water in Coachella Valley, California, 1917 (II).

*Bulletin No. 5—Report on the Utilization of Mojave River for Irrigation in Victor Valley, California, 1918 (v).

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Bulletin No. 7—Use of Water from Kings River, California, 1918.

*Bulletin No. 8—Flood Problems of the Calaveras River, 1919.

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*First Biennial Report, 1907–1908, Department of Engineering.

*Second Biennial Report, 1908–1910, Department of Engineering.

*Third Biennial Report, 1910–1912, Department of Engineering.

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*Report—State Water Problems Conference, November 25, 1916.

*Report on Pit River Basin, April, 1915.

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*Report on Iron Canyon Project, 1914.

*Report on Iron Canyon Project, California, May, 1920.

(†) Reprinted in 5th Biennial Report. (Out of print.)

(II) Reprinted in 5th Biennial Report. (Out of print.)

(v) Reprinted in 6th Biennial Report. (Out of print.)

*Reports and Bulletins out of print, may be borrowed by your local library from the California State Library at Sacramento, California.