PRESENT YIELD AND ACTUAL

CONSUMPTION OF THE

FLUME SYSTEM

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# REPORT

## HYDRAULIC STUDIES FOR CUYAMACA WATER COMPANY

Made in Connection with

STATE RAILROAD COMMISSION RATE FIXING CASE.

By Charles H. Lee, Hydraulic Engineer.

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The following study of the records of the Cuyamaca Water Company, (formerly the San Diego Flume Company), was undertaken at the written request of Mr. W. H. Pont, Engineer for Murray and Fletcher, the present owners of the San Diego Flume system. This statement is accompanied by tables and diagrams showing the supply of gravity water derived by the flume in past years from Cuyamaca Reservoir and San Diego River and the supply pumped from the river gravels above Lakeside; also the total volume of water consumed in recent years, its proportional distribution among various classes of consumers, its monthly rate of use; a classification of lands listed in contracts; and a study of duty of water. From these tables and diagrams it is possible to answer such questions as the safe yield of the system as it stands adequacy of service for present contract consumers, and other matters about which it will be necessary for the Commission to have accurate data.

The system consists of the Cuyamaca Reservoir located in the mountains at head of Boulder Creek, a tributary of San Diego River, at an elevation of 4,600 feet above sea level; the channel of Boulder Cr., about 12½ miles in length, into which the reservoir discharges and which carries the draft to the main San Diego River; a diverting dam across San Diego River, located a few hundred feet down stream from the mouth of Boulder Cr. at an eleva-

ion of about 800 feet; a flume line 31.4 miles in length of which 0.8 mi. are tunnel, 0.76 miles steel syphon and 29.84 miles wooden flume; two storage reservoirs near the end of the flume, Murray Hill and La Mesa which are used for storing the flood flow of the San Diego River; a small regulating reservoir at the end of the flume known as the Eucalyptus; and distributing pipe lines from these three reservoirs to irrigation and domestic consumers. The pipe line distrubuting system may be divided into the high and low pressure services. With the present dams, the maximum capacity of these four reservoirs is as follows; Cuyamaca 11.400 ac.ft., La Mesa 1460 ac.ft., Murray Hill 134 ac.ft., and Eucalyptus 26 ac.ft., making a total of 13020 ac.ft. There is also a small storage capacity behind the diverting dam which is used for daily regulation at the head of the flume. The maximum capacity of the flume as determined by U.S. Geological survey current meter gagings in the flume at the Company's gage about 1000 feet below the diverting dam was 14.4 second feet, prior to October , 1911. s ince that date the sides of the flume have been raised from 14 inches to 28 inches from diverting dam to Sand Creek, and this section has a maximum capacity of 45.2 second feet, according to Government measurements. At Los Coches gaging station 18.5 miles from diverting dam a maximum of 16.1 second feet has been recorder, the additional water probably being derived from South Fork, a tributary of San Diego River below the diverting dam. The flume has a uniform grade of 4.75 feet per mile, the depth is 14 inches, and width 5 feet 10 inches inside.

RECORDS.

The Company's original hydraulic records consist of measurements of depth of water in Cuyamaca, Eucalyptus, La Mesa and Murray Hill reserviors; depth of water in the flume at Diverting Dam, at



Chocolate 11.29 miles below diverting dam, at Los Coches 21.09 miles below diverting dam, and at Grossmont near the end of the flume. There are capacity tables available for each reservoir prepared from the original contour maps of the reservoir sites. These are shown graphically on diegrams 1.018, 1.021, 1.022, 1.023. There are current meter ratings available at the diversion dam and Los Coches based on the Compan's gages which have been prepared and furnished by the U.S. Geological Survey (See Table 20 & diagram 1.019) The survey also has rated a flume section 300 ft. below the diverting dam and above the settler and installed a gage which is now observed daily. (See Table 21.)

There is also availabe the draft in Miner's inches from Cuyamaca as reported by the care taker at the dam. These were obtained by observing the depth of water in an orifice 6 ft. long and 10½ inches high, whose lower edge was practically flush with the bottom of the stream channel. There have been occassions when this depth exceeded 10 inches so that there was backwater effect. (See picture on next page ) The discharge was obtained by entering these depths in a standing weir table prepared from the Francis formula for weirs without end contractions. The results were obviously erroneous. In the fall of 1911 the Company installed a true weir of the Cippoletti type above the old one, and in July, 1912, E. W. Case of the Company made a current meter rating of the new weir. It was found that more water was passing over the weir than indicated by the weir table, so that a rating table was prepared for the weir. (See Table 11.) On August 8, 1912 a rating of the old weir was obtained by C. H. Lee based on Case's rating of the new weir by making synchronus observations of depth over the crest of each weir. (See diegram 1.017) From this a conversion table was prepared (Table (10) by which recorded drafts can be changed to true draft for the

period 1888 to end of 1911. Since Jan. 1, 1912 observations of depth have been made in the new weir to which Case's rating applies. Observations of waste at Cuyamaca consisted of noting the depth and width of the stream passing through the spillway.

Observations of flood waste at the Diverting Dam on San Diego River consist of depths of water over the crest of the dam noted by eye without the aid of a gage rod or foot rule. The amount passing through the waste gates in the dam was also estimated by eye as so many Miner's inches on several occasions having been reported as great as 15,000 M.I. These observations are thus very unsatisfactory. To complcate matters further the main crest of the dam was not level, there were several notches at higher levels and a considerable angel exists near the center of the channel. In the spring of 1912 five feet was added to the height of the dam and the original conditions change. A rating table prepared by Messrs Hartl and Case of the Company based on original conditions is presented in Table 22, The Francis weir formula was used with a factor of 0.80 to correct for broad crest conditions.



## YIELD CUYAMACA RESERVOIR

There being no measurement of inflow for Cuyamaca, the study of the run off from the drainage area must be based on reservoir stages, draft and seepage and evaporation losses. The draft plus reservoir losses plus reservoir accretion ( or minus reservoir depletion) for a given period represents run-off during the period. Both daily draft and reservoir stages are available for the year 1888 and for the period 1895 to 1912. Reservoir loss is determinate when there is no precipitation or inflow but not at other times. The basis for computing losses during such periods was evaporation.

The nearest available records of evaporation from water surface are at Sweetwater Reservoir and Owens River near Independence. Conditions at Sweetwater are similar to those along the coast [illegible] that humidity is lower and average annual temperature slightly greater. Conditions at Independence are essentially those of the desert at 3500 ft. elevation. Cuyamaca has the same elevated desert conditions modified by a greater humidity during winter and early spring due to large precipitation. During the late spring, summer and fall humidity is very low at Cuyamaca. The mean annual temperature at Cuyamaca is 9 degrees lower that at Independence and 13 degrees lower than San Diego. In a scale of 10, temperature has an influence of about 6 on the annual depth of evaporation, humidity 3, and wind movement 1, according to recent Weather Bureau experiments. From the data on Tables 5 to 8 and Diagram 1,020 and our personal knowledge, the total annual evaporation from a water surface at Cuyamaca has been established at 58". The monthly distribution of this amount is assumed as that at Independence, the amount in the spring months being slightly less and in the fall slightly greater as indicated by the average monthly temperatures and the abnormal humidity during the rainy season at Cuyamaca. (See Table 7).

From this assumed evaporation record and the area of water surface in thereservoir for various gage heights (Diagrom 1.018) Tables 8 and 9 were prepared showing reservoir losses by evaporation each m month for gage intervals of one foot. By examination of reservoir stages during the period May 1895 to December 1896 when precipitation and run-off was small it was found that from December to May inclusive, which is the normal rainy season, reservoir losses are about equal to the evaporation shown by Tables 8 and 9. During June to November, however, reservoir losses exceed evaporation losses from 20 to 100%. This justifies the assumption that evaporation loss is the important one during the rainy season, and points to the very active loss by transpiration from vegetation and soil evaporation during the dry season, This is to be expected from the shallow saucer like shape of the reservoir.

As a convenient manner by which to study storage conditions at Cuyamaca a graph was constructed showing the amount of water in the reservoir each day for the whole period of record, and above this graph showing the depth of precipitation each day at the dam. On the graph of reservoir stage the draft was platted by months for each year. Draft usually commences late in May and continues to November. Hence reservoir losses during the period June to November were obtainable by scaling the distance between the draft line and a horizontal line drawn from the crest of the annual wave in the graph. A table was then prepared for each month showing total draft, and waste, (For computation of waste see tables 12 & 13,) reservoir stage on the first day of the month, gain or loss in storage during the month, mean area exposed, evaporation and other losses and finally the computed run-off. A summary of this tabulation by seasons is given in Table 14. The most striking conclusion from the data is that 56% of the water stored in Cuyamaca is lost in storage. The average run-off is about 0.49 second feet per



or 5.9 second feet total. Of this 7% was waste. 38% draft and 56% reservoir loss. The average draft was 2.4 second feet or 120 M.I. Diagram 1.014b shows the aggregate annual run-off and draft per square inch for the period, and is useful in making yield computations. The data indicates that the storage capacity at Cuyamaca is amply sufficient to regulate the run-off but that reservoir losses are very excessive.

BOULDER CREEK LOSSES.

The channel of Boulder Creek is lined with trees and shrubs and in portions choked with grass. There are also more or less porous formations filling the canyon bottom along the lower half, which absorb water by percolation. The loss suffered by Cuyamaca water in passing down this channel is considerable, even though there is a contribution from springs and seepage in certain short sections, and early in the period of draft or surface run-off.

The basis for computation of this loss in past years are a series of comparative measurements made August 15th to 16th, 1913 at Cuyamaca Dam and the mouth of Boulder Creek and the maximum amount of water which if, liberated at Cuyamaca, will be completely lost before reaching Diverting Dam. The letter quantity was determined to be about 0.5 second feet by comparing the effect of increase in draft at Cuyamaca from zero to 2 or 3 second feet upon corresponding increase in the rate of diversion at Diverting Dam. The average draft for the period August 15th to 16th was 9.35 second feet and the average flow at the mouth of Boulder Creek as measured in a standard rectangular weir 37.4 Sec. Ft. giving loss of 1.95 sec. ft. From this data, Diagram 1.016 was constructed according to the principles developed in the Owens Valley experiments made by the Los Angeles Aqueduct (See Engineering News, Apr. 21, 1910). With this diagram the average monthly draft at Cuyamaca was corrected throughout the period of record tothe amount which should

appear at Diverting Dam (See Table 15,16,17,18 & 19). By choosing months when it is known that the only source of water for the flume the measured draft and measured flume diversion it is found that at Diverting Dam is from Cuyamaca and comparing the loss agrees closely with that indicated by the diagram. Table 18 shows that the Boulder Creek loss varies from 84 to 15% during the period of record, being, largest during years when the rate of draft is small. The average loss is 30%. For normal and above normal years it is about 24% and for years below normal between 35 and 40%.

YIELD SAN DIEGO RIVER AT DIVERTING DAM.

The computation of yield of the 92 sq. miles of drainage area of San Diego River above Diverting Dam exclusive of Cuyamaca was based on the gage height records and estimates at the dam andthe rating curves which have already been described. The records covers the period Jan. 1895 to date. The Company's records were searched, daily gage heights recorded and daily estimates of waste over dam or through gates noted. Cuyamaca water was eliminated by subtracting the corrected draft from the amount diverted by the flume, (See table 25 to 27 inclusive), A Summary by years is given on Table 28, and shows the mean run-off, exclusive of Cuyamaca, to be 17.50 sec. ft. or 0.19 sec. ft. per sq. mi. On Table 29 it is shown that the average run-off at Cuyamaca is the same for the period 1893-4 to 1911-12 as for the period 1898-9 to 1911 12. Hence by using the ratios of annual run-off to the 19 year mean at Cuyamaca the run-off at Diverting Dam can be computed back to 1893-4. From this data diagram 1.012½ has been prepared giving aggregate run-off per sq. mil. each season since 1893-4. Table 30 gives by years the amount of water diverted by the flume from the river and shown that out of a total of 17.5 sec. ft. passing the div rting dam only 3.72 sec. ft. or 21% has been diverted. The daily hydrograph of the river



at the diverting Dam presents the conditions very strikingly. The run-off is rapid and all concentrated in a few months in the early part of the year. The annual variations are extreme ranging from 6 to 503% of the mean. Thus tomake beneficial use of the total run-off both monthly and annual regulation is necessary. This could be accomplished by storage of the flood waters.

FLUME SUPPLY

The supply of water available to the flume is best determined by an examination of the amo nt actually diverted as shown in Tables 22,24,25, 26, 27,29, 30 and the daily hydrograph at Diverting Dam. The record c overs a period of dry years, 1899 to 1904 inclusive, two of which 1900 and 1904 are the driest on record in Southern California, and a period of normal and wet years 1905 to date. The full range of run-off conditions is therefore well covered by actual measurements. An examinatin n of the hydrograph shows that there was no water available for diversion at Diverting Dam in 1899 from middle of June to Dec. 31st, in 1900 from June to December inclusive in 1901 September to December inclusive, in 1902 January andAugust 15th to December 31st. in 1903 September to Dec. inclusive, in 1904, January, February and first half of March and May to December inclusive, nd in 1911, October to December inclusive. During this period 1899 to January 1905 even when there was water available for diversion from the river and from Cuyamaca the amount was below normal. Since January 1st, 1905, however, there has never been a time when sufficient waterto meet all demands was not available either from the river or from Cuyamaca except during the fall of 1911. It has been the policy of the Company to carry water in the flume only when it could be used immediately by consumers or stored in La Mesa Reservoir for use later in in the year. Hence the average annual diversion 6073 Acre ft. (8.4 c.f.)

shown by Table 30 during the years 1905 to 1910 inclusive represents the amount of water required to meet the normal demands of all actual consumers during that period together with flume, reservoir, and distribution losses. The small amount diverted prior to 1905 and in 1911 represents shortage of supply which the company and the consumers were compelled to meet. In the dry years of 1899 to 1900 and 1904 the average amount diverted was only 868 ac. ft. (1.2 s.f.)or 14% of the normal and in the moderately dry years 1901 to 1903 inclusive 3181 ac. ft. (4.4 s.f.) or 52% of the normal.

This shortage the company relieved to a certain extent by pumping from the river gravels in Santa Ysabel Valley. By such means the average annual supply was kept up to a minimum of 2214 ac. ft. (3.3 s.f.) or 36% of normal during the dryest years of 1899,1900 and 1904 and at 4131 ac. ft. (5.7.s.f.) or 68% of normal in theyears 1901,1902, and 1903.(See Table 31 and 31A). If warned it is possible to keep an orchard alive in San Diego County on half supply by intensive cultivation and careful use of water. Hence the situation was met in all but the dryest years which are universally recognized as remote extremes.

Considering the flume and reservoir alone however, it can be said that during years of large run-off and during a normal year following one of large run-off the amount which the flume can divert is normal or 6075 ac. ft. (8.4 s.f.) Inspection of table 29 shows that there are no years of record with normal run-off because of the extremes which characterize the stream. It is doubtful however whether 6075 ac. ft. (8.4.s.f.) could be diverted during a series of two or more normal years on account of the insufficient over-year storage. In years below normal in run-off the amount which the flume can divert is less than 6075 ac. ft.



(8.4 S.F.) In the years 1901 to 1903 (corresponding to the seasons 1900-01, 1901-02, 1902-03,) when the run off averaged 62% of the normal the flume diverted 4.4 sec. ft. or 52% of the normal diversion; and in the years 1899, 1900 and 1904 when the run-off averaged only 10% of the normal the flume supply was 868 ac. ft. (1.2 s.f.) or 14% of the normal diversion. Referring again to table 29 it is seen that 6 years out of 19 were above normal, one was normal, 8 moderately dry and 4 very dry. This 19 year period includes a period of nine years drought which probably will not occur again within a generation but even under most favorable conditions the proportion of wet years in a long series is less than half. Hence the present system is able to yield 6075 ac. ft. (8.4 s.f.) per annum less than half the time. The obvious remedies are additional storage of flood waters in the mountains or pumping from the gravels

of the San Diego River.

CONSUMPTION.

The amount of water actually sold from the system is measured each month and a record of this is available for several years past. Water delivered to consumers from the flume is measured through rectangular orifices under a constant head of 4 inches and reported as so many M.I. at the rate of one Miner's inch to one sq-in, of opening. These openings vary from one to three inches in depth and the lenght is adjustable. Water delivered from the reservoirs and the high and low service pipe lines is measured by meter. Tables 32 to 35 give the actual consumption by months for the years 1909 to 1912. It will be noted that the flume deliqered 50% the high service 37% and the low service 12% of the total. The average annual comsumption during 1909 and 1910 when a normal supply was available was 256 M.I. continuous flow or 3702 ac.ft. In 1911 it was 208 M.I. or 3008 ac.Ft. The values are 62% and 84% of the corresponding amount diverted at the river. The total losses in the flume and in storage between diverting dam and the distributing meters was therefore 38% in 1909 and 1910 and 16% in 1911. The falling off of losses in 1911 was due probably to the repair wrk done on the flume from June to September. In this connection itis of interest to note the results of current meter measurements made Auguat 20, 1912, at Chocolate and Los Coches gaging statins. The lenght of flume in this section is 9.54 miles. The discharge at Chocolate at 2P. M. was 5.1 sec. Ft. and at Los Coches at 5.20 PM 4.7 sec. ft. The time required for passage of water between the two points is about 8 hours so that the same water was not measured but conditions were fairly contant. Deductiong a diversion of 1 M.M. the loss is 0.38 sec.ft. or 0.040 sec.ft per mile.



For the full length of the flume this would be 1.20 Sec.ft. loss in total or about 20% of the amount diverted.

The monthly distribution of consumption is shown by diagrams 1.009, 1.010, 1.024, all of which have a marked agreement. Considering the distribution of total consuption the following can be said. The greatest consumption occurs in the months May to October inclusive. The maximum is about 356 M.I. or 140% of the annual rate of consumption of 256 M.I. The smallest consumption occurs in the months December to March inclusive which are the months of greatest rainfall. (See table 2.) The normal minimum is about 90M.I. or 35% of the annual. The months April and November are intermediate between maximum and minimum.

In this connection it should be noted that a contract Miners inchgives the consumer the right to demand a full Miner's inch of water whenever he so desires but not the privilege of accumulation. Hence with the variation in consumption noted on diagram 1.024 the company does not have to provide a continuous flow of so many contract inches.

The condition is analogous to that of a hydroelectric power plant carrying a municipal load. A company operating such a plant may contract for two or two and one half the continuous output of the plant bu providing daily regulation of the water supply and adjusting the rate of output to the demand. Hence in talking of Miner's inches continuous flow it should be remembered that this water is actually delivered at a much greater rate than the continuous flow in the period of maximum demand and at a less rate during the rainy season when there is a very small demand.

There are three types of consumption from the system, irrigation, domestic wholesale and domestic retail. (See Table 36) The

bulk of the consumption, 94%, is irrigation, 4% is domestic whole-sale and 2% domestic retail Table 36 was prepared by determining from meter measurements the acutal percapita consumption of 1100 people in the town of La Mesa and applying the rate to the total population supplied by the flume, the high service and the low service. The rate thus determined was 95 gals. per capita per day; the population served by the flume was 371, by the high service 1590 and by the low service 176.

The amount of water used per acre in irrigation is shown on Table 37 and the classification of the lands irrigated on Table 40. It will be noted that on the flume and low service where the use is largely irrigation and the bulk of that on Citrus land the duty of water is about 14 acres per continuous S.I. in 1910 when the supply was ample and 17.5 in 1911 when there was a shortage. The minimum duty occurred in the summer months and was 11.9 acres per S.I. for lands built up with berries and for olives and Deciduous fruits the duty is greater than for citrus trees.

It should be noted that of the 10075 acres listed on water contracts 52% are not irrigated. If the remainder, 9% are build up with homes, 28% citrus, 4% vegetables berries and alfalfa and 6% olives and deciduous fruit trees.

## SUMMARY STATEMENT ON WITNESS STAND BY C. H. LEE, HYDRAULIC ENGINEER.

## REGARDING AVAILABLE WATER SUPPLY OF CUYAMACA WATER COMPANY SYSTEM.

At the request of Mr. W. S. Post, I have undertaken a thorough hydraulic study of the existing reservoir and flume system of the Cuyamaca Water Co. for the purpose of determining the amount of available water supply and the amount used by the consumers. The basis for the studies has been the original records of daily depths of water in reservoirs and in the flume at various places, as kept by the San Diego Flume Co. and the Cuyamaca Water Co. The measurements of reservoir depths have been converted to volumes by preparing capacity tables of the reservoirs from the original survey. The ratings of flume sections made by the Water Resources Branch of the U. S. Geological Survey are the basis of computations of flow in the flume. The computations of draft from Cuyamaca Reservoir are based on careful weir ratings made by Mr. E. W. Case and myself. Flood water quantities are estimates by gate-keepers at the Cuyamaca and Diverting Dam and were reviewed by myself and regarded as approximately correct.

The detailed results of these studies is presented on the two exhibits, "Hydrograph of daily amount of water in Cuyamaca Reservoir," and "Daily flow of San Diego River at Diverting Dam." The reservoir capacity curves, rating curves, and other graphical diagrams are presented in the large folder "Diagrams accompanying report on present yield and consumption of the System." The tabular results of the studies are presented in the small folder "Present Yield and Actual Consumption of the Flume System" and consist of a set of 40 tables with detailed statement of method of preparation and conclusions drawn therefrom. Briefly stated these conclusions are as follows:

1. The Cuyamaca Reservoir has ample capacity to regulate the run-off of the tributary drainage area. It is useful as a monthly regulator but has little value for over-year storage. Reservoir losses are 56% of the catchment.

2. The loss of Cuyamaca Storage water in passing down the channel of Boulder Cr. averages 30% per annum and ranges from 84 to 15% depending on the amount of water.

3. The annual variation in run-off from the area tributary to diverting dam is extreme. Most of the run-off occurs during the months January to April inclusive. The river is dry from May or June to December or January unless the preceeding winter has been very wet. During the last thirteen years the San Diego Flume has diverted 21% of the water reaching the dam, exclusive of that from Cuyamaca, the remainder being flood waste.

4. The annual supply at diverting dam which will meet present consumption and losses in distribution with reasonable flume loss of 15% and 25% total loss is 5205 ac. ft. or 360 M.I. continuous flow. This can be supplied only 5 years out of ten with the present system. The supply at diverting dam in years of ordinary drought such as 1902 when run-off was 36% of normal is 256 M.I. continuous flow. In years of extreme drought such as 1904 when run-off was 6% of normal the supply is 88 M.I. continuous flow. The shortages in years below normal can be physically supplied by storage of flood waters and pumping from the river gravels. The latter was done in the dry period 1899 to 1904 inclusive, the aver amount pumped for the period being 87 M.I. continuous flow.

5. The total annual volume of water delivered to consumers at meters, exclusive of the Indians in years of ample supply is 3702 ac. ft. or 256 M.I. continuous flow. This is delivered at a maximum



monthly rate of 356 M.I. during the five months of heaviest irrigation and at a minimum of about 90 M.I. during the rainiest winter months. The average amount of water which has been delivered to meters in the past 13 years including that pumped is 222 M.I. continuous flow or 444 M.I. for six months, this amount including that used by the Indians which is less than 40 M.I. for six months.

6. Ninety four per cent of the total consumption is used in irrigation. The remaining 6% is domestic consumption.

7. The total area of land listed on water contracts is 10,076 acres. Of this, 5278 acres or 52% is not irrigated and no demands have been made by the owners for water to irrigate it.

8. There is no such thing in irrigation practice as a continuous Miner's Inch. An irrigator wants water when his crop or trees need it but at other times he allows it to pass his headgate without using it. Thus the consumption in summer is greater than the average or continuous flow and less in winter. The term contract miners inch represents the maximum flow of water to which an irrigator is entitled under the terms of a so called water right contract. The actual amount of water used by an irrigator expressed as a continuous flow is less than the number of Miners Inches called for in the contract. Hence in determining whether a system is adequate to deliver water to consumers in the amount and at the time they require, the actual consumption in periods of sufficient supply, and not the number of contract miners inches, should be compared with the amount which the system can deliver.

The reason for expressing the results of these studies in continuous miners inches is to simplify the statement.

SUMMARY OF PRECIPITATION RECORDS IN SAN DIEGO COUNTY UPON WHICH ISOHYETOS MAP FOR SAN DIEGO RIVER ARE BASED.

| Station | Authority | Elev. | Seasons of Record | Observed Mean | Mean of San Diego for same No. of seasons as Station's Record | Relation of San Diego period record to long term record (56-10) % | Proportional Mean for long Term |
|---|---|---|---|---|---|---|---|
| San Diego | U S W B | 93 | 56-10 | 9.62 | - | 100.0 | 9.62 |
| Poway | " | 460 | 79-09 | 13.96 | 10.16 | 105.5 | 13.20 |
| Sweetwater Reservoir | U S GS | 250 | 88-09 | 9.55 | 9.37 | 97.5 | 9.80 |
| El Cajon | U S W B | 482 | 99-12 | 13.04 | 9.08 | 94.5 | 13.82 |
| Escondido | " | 657 | 75-11 | 15.27 | 10.12 | 106.2 | 14.40 |
| Fallbrook | " | 700 | 76-03 | 17.14 | 9.79 | 101.6 | 16.90 |
| Campo | " | 2543 | 77-09 | 20.81 | 10.37 | 107.8 | 19.34 |
| Valley Center | U S G S | 1365 | 72-99 | 20.03 | 10.03 | 104.1 | 19.21 |
| Oceanside | City clerk | 60 | 92-12 | 10.72 | 9.20 | 95.6 | 11.22 |
| Cuyamaca | U S W B | 4680 | 87-10 | 40.07 | 9.41 | 97.8 | 41.00 |
| Julian | " | 4500 | 79-11 | 28.93 | 10.7 | 111.2 | 26.0 |
| Nellie | " | 5300 | 04-10 | 44.26 | 10.37 | 107.8 | 41.05 |
| Santa Isabel | " | 2983 | 00-10 | 24.17 | 10.10 | 105.0 | 23.00 |
| Jamul | SCMW Co | 900 | 05-10 | 13.00 | 11.28 | 118.2 | 11.00 |
| Barrett Dam | " | 1700 | 06-10 | 19.07 | 10.27 | 106.7 | 17.78 |
| Morena " | " | 3300 | 06-10 | 24.15 | 10.27 | 106.7 | 22.68 |
| Mesa Grande | U S W B | 3350 | 06-10 | 30.70 | 10.27 | 106.7 | 28.80 |
| Descanso | " | 3500 | 95-02 | | | | |
| | | 3350 | 09-11 | 21.36 | 8.07 | 84. | 25.40 |
| Diverting Dam | Cuy.W.Co. | 808 | 99-12 | 16.67 | 9.97 | 103.6 | 16.10 |
| Chocolate Cr. | " | 753 | 99-12 | 16.53 | 9.97 | 103.6 | 15.98 |
| Los Coches | " | | 00-12 | 13.28 | 10.31 | 107.1 | 12.40 |
| Eucalyptus Reservoir | " | 636 | 99-12 | 13.25 | 9.97 | 103.6 | 12.80 |
| Head Escondido ditch | Escondido Water Co. | (1600) | 02-11 | 22.67 | 10.71 | 111.4 | 20.35 |
| Warner Rnch | U S W B | 2900 | 06-10 | 19.33 | 10.26 | 106.7 | 18.15 |
| Ramona | Private | 1440 | 09-12 | 18.37 | 10.84 | 112.8 | 16.30 |



PERCENTAGE OF ANNUAL PRECIPITATION OCCURRING EACH MONTH FOR TYPICAL OAK MESA SO. STATIONS.

| Month | San Diego | Cuya-maca | Julian | Escon-dido | Ocean-side | Bell-Brook | Poway | Average |
|---|---|---|---|---|---|---|---|---|
| Jul | .6 | 1.7 | 1.7 | 0 | .2 | .2 | .3 | .5 |
| Aug | 1.2 | 1.6 | .2 | 0 | .6 | [illegible] | [illegible] | .6 |
| Sep | .6 | 11.5 | .5 | .8 | .6 | .6 | .6 | .8 |
| Oct | 3.6 | 4.5 | 3.3 | 3.7 | 4.5 | 4.2 | 3.6 | 3.8 |
| Nov | 10.0 | 8.5 | 8.0 | 9.5 | 9.6 | 8.6 | 8.7 | 9.0 |
| Dec. | 19.1 | 12.9 | 7.1 | 17.2 | 14.5 | 16.9 | 15.6 | 14.6 |
| Jan | 18.4 | 17.8 | 20.4 | 20.2 | 20.7 | 19.9 | 22.8 | 20.9 |
| Feb | 20.5 | 20.1 | 17.9 | 18.2 | 14.3 | 19.9 | 18.9 | 18.5 |
| Mar | 15.3 | 20.5 | 28.6 | 17.9 | 20.7 | 17.5 | 19.0 | 19.1 |
| Apr | 6.4 | 5.9 | 9.2 | 7.6 | 6.0 | 7.6 | 8.1 | 7.4 |
| May | 3.5 | 5.6 | 6.2 | 3.0 | 2.2 | 5.6 | 3.9 | 4.1 |
| June | .6 | .6 | .3 | 0.5 | 0 | .5 | .5 | .4 |
| Total 100 Tot. of | | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Months | 9.56 | 39.26 | 26.50 | 15.76 | 10.72 | 12.03 | 15.97 | |
| Seasons | 54-09 | 87-09 | 80-09 | 75-11 | 92-12 | 77-03 | 78-09 | |

TABLE SHOWING MEAN MONTHLY AND ANNUAL TEMPERATURE AT SAN DIEGO, CUYAMACA AND INDEPENDENCE

| Mo. | San Diego Mean | Cuyamaca Mean | Independence Mean |
|---|---|---|---|
| Jan | 54.0 | 37.0 | 40.5 |
| Feb | 54.6 | 36.3 | 43.7 |
| Mar | 55.2 | 39.9 | 49.6 |
| Apr | 58.2 | 43.9 | 56.7 |
| May | 60.8 | 49.5 | 64.5 |
| Jun | 63.8 | 60.7 | 73.4 |
| Jul | 66.2 | 65.1 | 78.5 |
| Aug | 65.7 | 64.5 | 76.4 |
| Sept | 66.9 | 58.0 | 69.1 |
| Oct | 63.0 | 49.6 | 59.3 |
| Nov | 59.0 | 44.7 | 49.2 |
| Dec | 58.7 | 38.7 | 41.6 |
| Year | 60.8 | 49.1 | 58.6 |



TABLE SHOWING MONTHLY MAXIMUM, MINIMUM & MEAN TEMPERATURE
1909.
SAN DIEGO, CUYAMACA, INDEPENDENCE.

| Mo. | San Diego Max. | Min. | Mean | Cuyamaca Max | Min | Mean | Independence Max | Min. | Mean |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 70 | 42 | 54.2 | 67 | 23 | 42.7 | 66 | 22 | 41.7 |
| Feb | 74 | 41 | 54.2 | 61 | 23 | 40.4 | 63 | 19 | 40.9 |
| Mar | 74 | 42 | 54.6 | 61 | 25 | 40.0 | 68 | 22 | 44.2 |
| April | 82 | 46 | 59.0 | 72 | 30 | 50.1 | 81 | 28 | 56.0 |
| May | 87 | 50 | 59.8 | 81 | 32 | 53.7 | 91 | 36 | 60.6 |
| Jun | 77 | 53 | 62.6 | 87 | 44 | 67.5 | 99 | 45 | 73.0 |
| Jul | 79 | 58 | 65.2 | 91 | 48 | 72.2 | 102 | 51 | 76.6 |
| Aug | 93 | 59 | 68.6 | 88 | 52 | 72.0 | 95 | 52 | 75.3 |
| Sep | 100 | 53 | 66.7 | 83 | 43 | 65.1 | 89 | 40 | 66.2 |
| Oct | 94 | 49 | 63.8 | 80 | 35 | 56.4 | 80 | 29 | 57.3 |
| Nov | 85 | 42 | 57.2 | 73 | 27 | 47.0 | 71 | 21 | 47.0 |
| Dec | 71 | 36 | 53.8 | 62 | 21 | 38.4 | 67 | 3 | 26.0 |
| Year | 100 | 36 | 60.0 | 91 | 21 | 53.8 | 102 | 3 | 55.38 |

## DEPTH OF EVAPORATION FROM WATER SURFACE AT SWEETWATER RESERVOIR NEAR SAN DIEGO.

| Mo. | Year 1889 Total in Inches | Year 1889 Rate in Ins.per 24 hrs | Year 1889 % of Total | Year 1890 Total in Inches | Year 1890 Rate in Ins.per 24 hrs | Year 1890 % of Total | Year 1891 Total in Inches | Year 1891 Rate in Ins.per 24 hrs | Year 1891 % of Total | Year 1892 Total in Inches | Year 1892 Rate in Ins.per 24 hrs | Year 1892 % of Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 1.990 | 0.064 | 3 | 1.588 | 0.051 | 3 | 3.608 | 0.116 | 6 | 2.542 | 0.082 | 4 |
| Feb | 3.336 | 0.119 | 6 | 2.214 | 0.079 | 4 | 1.353 | 0.048 | 2 | 1.394 | 0.050 | 2 |
| Mar | 3.380 | 0.109 | 6 | 3.280 | 0.106 | 6 | 3.075 | 0.099 | 5 | 3.075 | 0.099 | 5 |
| Apr | 4.961 | 0.165 | 9 | 4.141 | 0.138 | 7 | 3.707 | 0.124 | 6 | 5.822 | 0.194 | 10 |
| May | 5.822 | 0.188 | 10 | 6.140 | 0.198 | 10 | 5.599 | 0.181 | 10 | 4.674 | 0.151 | 8 |
| Jun | 6.806 | 0.227 | 12 | 7.302 | 0.243 | 12 | 6.027 | 0.201 | 11 | 6.478 | 0.216 | 11 |
| Jul | 7.398 | 0.239 | 13 | 7.380 | 0.238 | 12 | 6.501 | 0.210 | 11 | 8.808 | 0.284 | 15 |
| Aug | 8.253 | 0.266 | 14 | 9.020 | 0.291 | 15 | 8.890 | 0.286 | 15 | 6.540 | 0.211 | 11 |
| Sep | 7.360 | 0.245 | 13 | 6.482 | 0.216 | 11 | 6.150 | 0.205 | 11 | 6.273 | 0.209 | 11 |
| Oct | *2.998 | 0.097 | 5 | 4.920 | 0.159 | 8 | 6.314 | 0.203 | 11 | 6.560 | 0.211 | 11 |
| Nov | 4.800 | 0.160 | 8 | 5.535 | 0.184 | 9 | 4.100 | 0.170 | 7 | 4.766 | 0.165 | 8 |
| Dec | *0.246 | 0.008 | 1 | 1.845 | 0.060 | 3 | 2.752 | 0.089 | 5 | 2.614 | 0.084 | 4 |
| Year | 57.350 | 0.157 | 100 | 59.847 | 0.164 | 100 | 58.076 | 0.160 | 100 | 59.546 | 0.163 | 100 |

* Heavy rains these months.

| Mo. | AVERAGE Total in Inches | AVERAGE Rate in Ins.per 24 hrs | AVERAGE % of Total |
|---|---|---|---|
| Jan | 2.432 | 0.078 | 4 |
| Feb | 2.074 | 0.074 | 4 |
| Mar | 3.202 | 0.103 | 5 |
| Apr | 4.658 | 0.155 | 8 |
| May | 5.559 | 0.179 | 10 |
| Jun | 6.653 | 0.222 | 11 |
| Jul | 7.522 | 0.243 | 13 |
| Aug | 8.176 | 0.264 | 14 |
| Sep | 6.566 | 0.219 | 11 |
| Oct | 5.198 | 0.168 | 9 |
| Nov | 4.800 | 0.160 | 8 |
| Dec | 1.864 | 0.061 | 3 |
| Year | 58.704 | 0.160 | 100 |

The above record was made by observing fluctuations in a pan floating on surface of Sweetwater Reservoir. (See Water Supply Paper No 81, P 344.)

DEPTH OF EVAPORATION FROM WATER SURFACE AT PAN IN WATER

Observations by Los Angeles Aqueduct.

| Mo. | 1908 Total in inches | 1908 Rate in ins per 24 hrs. | 1909 Total in inches | 1909 Rate in ins per 24 hrs. | 1910 Total in inches | 1910 Rate in ins per 24 hrs | 1911 Total in inches | 1911 Rate in ins per 24 hrs. |
|---|---|---|---|---|---|---|---|---|
| Jan | - | - | 1.60 | 0.052 | 1.75 | 0.056 | 1.65 | 0.053 |
| Feb | - | - | 2.40 | 0.086 | 2.50 | 0.089 | 2.35 | 0.084 |
| Mar | - | - | 4.70 | 0.152 | 5.15 | 0.166 | 3.70 | 0.119 |
| Apr | - | - | 7.30 | 0.243 | 7.05 | 0.234 | 6.25 | 0.208 |
| May | - | - | 9.60 | 0.310 | 8.29 | 0.267 | 8.01 | 0.258 |
| Jun | - | - | 10.10 | 0.337 | 9.90 | 0.330 | | |
| Jul | - | - | 10.40 | 0.336 | 8.50 | 0.274 | | |
| Aug | 4.90 | 0.222 | 8.00 | 0.258 | 8.20 | 0.264 | | |
| Sep | 5.30 | 0.176 | 6.60 | 0.220 | 6.50 | 0.210 | | |
| Oct | 3.50 | 0.113 | 3.90 | 0.126 | 4.20 | 0.135 | | |
| Nov | 2.50 | 0.083 | 2.60 | 0.087 | 2.36 | 0.079 | | |
| Dec | 1.50 | 0.048 | (1.85) | 0.060 | 1.24 | 0.040 | | |
| Total | - | - | 69.05 | 0.189 | 66.44 | 0.179 | - | - |

| Mo. | Average % of annual evaporation during each month |
|---|---|
| Jan | 3 |
| Feb | 4 |
| Mar | 7 |
| Apr | 11 |
| May | 13 |
| Jun | 15 |
| Jul | 14 |
| Aug | 12 |
| Sep | 10 |
| Oct | 6 |
| Nov | 4 |
| Dec | 2 |
| | 100 |

# For period Aug. 10 to 31 incl.

ASSUMED DEPTH OF EVAPORATION FROM WATER

AT CUYAMACA LAKE

| Month | Total in inches | Rate in ins per 24 hrs | % of Annual |
|---|---|---|---|
| Jan | 1.16 | 0.037 | 2 |
| Feb | 1.74 | 0.062 | 3 |
| Mar | 3.48 | 0.112 | 6 |
| Apr | 5.22 | 0.174 | 9 |
| May | 6.96 | 0.224 | 12 |
| Jun | 8.70 | 0.290 | 15 |
| Jul | 8.12 | 0.262 | 14 |
| Aug | 6.96 | 0.224 | 12 |
| Sep | 6.38 | 0.212 | 11 |
| Oct | 4.64 | 0.150 | 8 |
| Nov | 2.90 | 0.097 | 5 |
| Dec | 1.74 | 0.056 | 3 |
| Year | 58.00 | 0.158 | 100 |



MONTHLY EVAPORATION LOSSES FROM CUYAMACA RESERVOIR

For various gage heights based on assumed Evaporation.
(Given in Million Gallons (M.G.)

| Gage Height Feet | Area Water Surface Acres | January Acre Ft. | January Million Gals | February Acre Ft | February Million Gals | March Acre Ft | March Million Gals | April Acre Ft | April Million Gals | May Acre Ft | May Million Gals | June Acre Ft | June Million Gals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | | | | | | | | |
| 10 | 6 | .6 | 0.2 | .8 | 0.3 | 1.7 | 0.5 | 2.6 | 0.8 | 3.5 | 1.1 | 4.4 | 1.4 |
| 11 | 20 | 1.9 | 0.6 | 2.9 | 0.9 | 5.8 | 1.9 | 10.9 | 3.6 | 11.6 | 3.8 | 14.5 | 4.7 |
| 12 | 44 | 4.2 | 1.4 | 6.4 | 2.1 | 12.8 | 4.2 | 19.1 | 6.2 | 25.5 | 8.3 | 31.9 | 10.4 |
| 13 | 73 | 7.1 | 2.3 | 10.6 | 3.5 | 21.2 | 6.9 | 31.8 | 10.4 | 42.4 | 13.9 | 53.0 | 17.3 |
| 14 | 106 | 10.2 | 3.3 | 15.4 | 5.0 | 30.8 | 10.0 | 46.1 | 15.0 | 61.5 | 20.1 | 76.8 | 25.0 |
| 15 | 144 | 13.9 | 4.5 | 20.8 | 6.8 | 40.3 | 13.2 | 62.5 | 20.4 | 83.5 | 27.2 | 104. | 33.9 |
| 16 | 178 | 17.2 | 5.6 | 25.8 | 8.4 | 49.8 | 16.2 | 77.4 | 25.2 | 103. | 33.6 | 129. | 42. |
| 17 | 215 | 20.8 | 6.8 | 31.2 | 10.2 | 60.3 | 19.7 | 93.5 | 30.4 | 125. | 40.7 | 156. | 50.8 |
| 18 | 255 | 24.6 | 8.0 | 37.0 | 12.1 | 74.0 | 24.1 | 111. | 36.2 | 148. | 48.2 | 185. | 60.3 |
| 19 | 299 | 29.0 | 9.5 | 43.4 | 14.2 | 86.8 | 28.3 | 130. | 42.4 | 174. | 56.8 | 217. | 70.8 |
| 20 | 346 | 33.4 | 10.9 | 48.0 | 15.6 | 100. | 32.6 | 151. | 49.2 | 201. | 65.5 | 251. | 81.9 |
| 21 | 386 | 37.3 | 12.2 | 50.2 | 16.4 | 112. | 36.5 | 168. | 54.8 | 224. | 73.0 | 280. | 91.2 |
| 22 | 428 | 41.4 | 13.5 | 62.2 | 20.3 | 124. | 40.5 | 186. | 60.6 | 248. | 80.9 | 310. | 101. |
| 23 | 472 | 45.6 | 14.8 | 68.5 | 22.3 | 137. | 44.6 | 206. | 67.1 | 274. | 89.3 | 342. | 111. |
| 24 | 519 | 50.2 | 16.4 | 75.2 | 24.5 | 141. | 45.9 | 226. | 73.7 | 301. | 98.1 | 376. | 123. |
| 25 | 567 | 54.8 | 17.9 | 82.2 | 26.8 | 164. | 53.5 | 246. | 80.2 | 329. | 107. | 411. | 134. |
| 26 | 605. | 58.5 | 19.1 | 87.8 | 28.6 | 175. | 57.0 | 263. | 85.8 | 351. | 114. | 438. | 143. |
| 27 | 644. | 62.2 | 20.3 | 93.4 | 30.4 | 187. | 60.9 | 280. | 91.2 | 375. | 122. | 467. | 152. |
| 28 | 684 | 66.1 | 21.6 | 99.2 | 32.3 | 198. | 64.5 | 297. | 96.9 | 397. | 130. | 496. | 162. |
| 29 | 725 | 70.1 | 22.8 | 105.1 | 34.2 | 210. | 68.5 | 315. | 103. | 420. | 137. | 525. | 171. |
| 30 | 768 | 74.3 | 24.2 | 111.5 | 36.4 | 223. | 72.7 | 334. | 109. | 445. | 145. | 556. | 181. |
| 31 | 804 | 77.7 | 25.3 | 116.5 | 38.0 | 233. | 76.0 | 350. | 114. | 466. | 152. | 583. | 190. |
| 32 | 842 | 81.4 | 26.8 | 122.0 | 39.8 | 244. | 79.5 | 366. | 119. | 489. | 160. | 610. | 199. |
| 33 | 880 | 85.1 | 27.8 | 128. | 41.7 | 255. | 83.1 | 382. | 124. | 510. | 166. | 638. | 205. |
| 34 | 919 | 88.9 | 29.0 | 133. | 43.4 | 266. | 86.6 | 400. | 130. | 533. | 174. | 666. | 217. |
| 35 | 959 | 92.7 | 30.2 | 139. | 45.3 | 278. | 90.6 | 417. | 136. | 556. | 181. | 695. | 226 |

MONTHLY EVAPORATION LOSSES FROM CUYAMACA RESERVOIR.

For Various gage heights based on assumed evaporation.
(Given in Million Gallons (M.G.)

| Gage Height Feet | Area Water Surface Acres | July Acre Ft | July Million Gals | August Acre Ft | August Million Gals | September Acre Ft | September Million Gals | October Acre Ft | October Million Gals | November Acre Ft | November Million Gals | December Acre Ft | December Million Gals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | | | | | | | | |
| 10 | 6 | 14.1 | 1.3 | 3.5 | 1.1 | 3.2 | 1.0 | 2.3 | 0.8 | 1.4 | 0.5 | .8 | 0.3 |
| 11 | 20 | 13.5 | 4.4 | 11.6 | 3.8 | 10.6 | 3.5 | 7.7 | 2.5 | 4.8 | 1.6 | 2.9 | 0.9 |
| 12 | 44 | 29.8 | 9.7 | 25.5 | 8.3 | 23.4 | 7.6 | 17.0 | 5.5 | 10.6 | 3.5 | 6.4 | 2.1 |
| 13 | 73 | 35.8 | 11.7 | 42.4 | 13.9 | 38.8 | 12.7 | 28.2 | 9.2 | 17.6 | 5.7 | 10.6 | 3.5 |
| 14 | 106 | 71.6 | 23.4 | 61.5 | 20.1 | 56.4 | 18.4 | 41. | 13.4 | 25.6 | 8.3 | 15.4 | 5.0 |
| 15 | 144 | 97.5 | 31.8 | 83.5 | 27.2 | 76.5 | 25.0 | 55.7 | 18.2 | 34.8 | 10.3 | 20.8 | 6.8 |
| 16 | 178 | 121. | 39.4 | 103. | 33.6 | 94.6 | 30.8 | 68.8 | 22.4 | 43.0 | 14.0 | 25.8 | 8.4 |
| 17 | 215 | 146. | 47.6 | 125. | 40.7 | 114. | 37.2 | 83.2 | 27.1 | 52.0 | 17.0 | 31.2 | 10.2 |
| 18 | 255 | 173. | 56.4 | 148. | 48.2 | 136. | 44.3 | 98.6 | 32.2 | 61.6 | 20.1 | 37.1 | 12.1 |
| 19 | 299 | 202. | 65.8 | 174. | 56.7 | 159. | 51.9 | 116. | 37.8 | 72.3 | 23.6 | 43.4 | 14.2 |
| 20 | 346 | 234. | 76.2 | 201. | 65.5 | 184. | 60.0 | 134. | 44.4 | 83.5 | 27.2 | 48.0 | 15.6 |
| 21 | 386 | 261. | 85.1 | 224. | 73.0 | 206. | 67.1 | 149. | 48.6 | 93.2 | 30.4 | 50.2 | 16.4 |
| 22 | 428 | 290. | 94.5 | 248. | 80.9 | 228. | 74.3 | 166. | 54.1 | 103. | 33.6 | 62.2 | 20.3 |
| 23 | 472 | 320. | 104. | 274. | 89.3 | 251. | 81.8 | 183. | 59.7 | 114. | 37.2 | 68.5 | 22.3 |
| 24 | 519 | 352. | 115. | 301. | 98.1 | 276. | 90.0 | 202. | 65.9 | 126. | 41.0 | 75.2 | 24.5 |
| 25 | 567 | 384. | 125. | 329. | 107. | 302. | 98.4 | 219. | 71.4 | 137. | 44.6 | 82.2 | 26.8 |
| 26 | 605 | 410. | 134. | 356. | 114. | 322. | 105. | 234. | 76.3 | 146. | 47.5 | 87.8 | 28.6 |
| 27 | 644 | 436. | 142. | 375. | 122. | 342. | 111. | 249. | 81.2 | 156. | 50.8 | 93.4 | 30.4 |
| 28 | 684 | 463. | 151. | 397. | 130. | 364. | 119. | 264. | 86.0 | 165. | 53.8 | 99.2 | 32.3 |
| 29 | 725 | 490. | 160. | 420. | 137. | 386. | 126. | 280. | 91.3 | 175. | 57.0 | 105.1 | 34.2 |
| 30 | 768 | 520. | 169. | 445. | 145. | 408. | 133. | 297. | 97.8 | 186. | 60.7 | 111.5 | 36.4 |
| 31 | 804 | 545. | 178. | 466. | 152. | 428. | 140. | 311. | 101. | 194. | 63.2 | 116.5 | 38.0 |
| 32 | 842 | 570. | 186. | 489. | 160. | 448. | 146. | 326. | 106. | 204. | 66.5 | 122.0 | 39.8 |
| 33 | 880 | 595. | 194. | 510. | 166. | 468. | 153. | 340. | 111. | 212. | 69.1 | 128. | 41.7 |
| 34 | 919 | 622. | 202. | 533. | 174. | 489. | 159. | 356. | 116. | 222. | 72.4 | 133. | 43.4 |
| 35 | 959 | 649. | 212. | 556. | 181. | 510. | 166. | 371. | 121. | 232. | 75.6 | 139. | 45.3 |

CONVERSION TABLE

For obtaining correct draft from Cuyamaca Res. from 1888 to 1912 from values entered in original record book. (See plotted curve)

Prepared by C. H. Lee.

| Draft in H.I. recorded in original Record Bk. | Corresponding draft according to revised rating tabel H.I. | Gage Hei. old Meas. Box. Sec.ft | Lee's Box. M.G.D |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 25 | 30 | .6 | 0-1" |
| 50 | 48 | .96 | 1 10/16 |
| 75 | 64 | 1.29 | 2 1/8 |
| 100 | 80 | 1.60 | 2 0/16 |
| 125 | 94 | 1.89 | 3 |
| 150 | 110 | 2.20 | 3 3/8 |
| 175 | 126 | 2.53 | 3 13/16 |
| 200 | 144 | 2.87 | 4 3/16 |
| 225 | 159 | 3.16 | 4 1/2 |
| 250 | 178 | 3.55 | 4 13/16 |
| 275 | 194 | 3.88 | 5 1/8 |
| 300 | 212 | 4.25 | 5 7/16 |
| 325 | 232 | 4.65 | 5 3/4 |
| 350 | 252 | 5.05 | 6 |
| 375 | 276 | 5.52 | 6 5/16 |
| 400 | 300 | 6.00 | 6 1/2 |
| 425 | 325 | 6.50 | 6 13/16 |
| 450 | 352 | 7.05 | 7 1/16 |
| 475 | 381 | 7.62 | 7 5/16 |
| 500 | 412 | 8.25 | 7 9/16 |
| 525 | 446 | 8.92 | 7 13/16 |
| 550 | 480 | 9.60 | 8 1/16 |
| 575 | 512 | 10.25 | 8 5/16 |
| 600 | 542 | 10.85 | 8 9/16 |
| 625 | 575 | 11.50 | 8 12/16 |
| 650 | 605 | 12.10 | 9 |
| 675 | 635 | 12.70 | 9 3/16 |
| 700 | 665 | 13.30 | 9 7/16 |
| 725 | 695 | 13.90 | 9 5/8 |
| 750 | 725 | 14.50 | 9 7/8 |
| 775 | 755 | 15.10 | 10 1/8 |
| 800 | 786 | 15.72 | 10. 5/16 |
| 850 | 848 | 16.95 | 10. 3/4 |
| 900 | 909 | 18.18 | 11. 1/4 |
| 1000 | | | |

# Rating Table

11

for

WEIR measuring draft on Cuyamaca Reservoir 100 ft below the dam. From gagings by E.W. Case July 25-26 '12

| Depth in In. | Disch. Sec. Ft. | Flow In Miners Ins | Gallons per 24 hrs. | Depth in In. | Disch. Sec. Ft. | Flow in Miners In. | Gallons per 24 hrs. | Depth in In. | Disch Sec. Ft. | Flow in Miners Ins | Gals. per 24 hrs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 4 3/8 | 6.1 | 305 | 3,952,800 | 8 3/4 | 15.8 | 790 | 10,238,400 |
| 1/8 | .2 | 10 | 129,600 | 4 1/2 | 6.3 | 315 | 4,082,400 | 8 7/8 | 16.0 | 800 | 10,368,000 |
| 1/4 | .4 | 20 | 259,200 | 4 5/8 | 6.5 | 325 | 4,212,000 | 9" | 16.3 | 815 | 10,562,400 |
| 3/8 | .5 | 25 | 324,000 | 4 3/4 | 6.7 | 335 | 4,341,600 | | | | |
| 1/2 | .7 | 35 | 453,600 | 4 7/8 | 7.0 | 350 | 4,536,000 | | | | |
| 5/8 | .9 | 45 | 583,200 | 5" | 7.2 | 360 | 4,665,600 | | | | |
| 3/4 | 1.0 | 50 | 648,000 | 5 1/8 | 7.5 | 375 | 4,860,000 | | | | |
| 7/8 | 1.2 | 60 | 777,600 | 5 1/4 | 7.8 | 390 | 5,054,400 | | | | |
| 1" | 1.3 | 65 | 842,400 | 5 3/8 | 8.1 | 405 | 5,248,800 | | | | |
| 1 1/8 | 1.5 | 75 | 972,000 | 5 1/2 | 8.4 | 420 | 5,443,200 | | | | |
| 1 1/4 | 1.7 | 85 | 1,101,600 | 5 5/8 | 8.7 | 435 | 5,637,600 | | | | |
| 1 3/8 | 1.8 | 90 | 1,166,400 | 5 3/4 | 8.9 | 445 | 5,767,200 | | | | |
| 1 1/2 | 2.0 | 100 | 1,296,000 | 5 7/8 | 9.2 | 460 | 5,961,600 | | | | |
| 1 5/8 | 2.1 | 105 | 1,360,800 | 6" | 9.5 | 475 | 6,156,000 | | | | |
| 1 3/4 | 2.3 | 115 | 1,490,400 | 6 1/8 | 9.8 | 490 | 6,350,400 | | | | |
| 1 7/8 | 2.5 | 125 | 1,620,000 | 6 1/4 | 10.1 | 505 | 6,544,800 | | | | |
| 2" | 2.7 | 135 | 1,749,600 | 6 3/8 | 10.4 | 520 | 6,739,200 | | | | |
| 2 1/8 | 2.8 | 140 | 1,814,400 | 6 1/2 | 10.7 | 535 | 6,933,600 | | | | |
| 2 1/4 | 3.0 | 150 | 1,944,000 | 6 5/8 | 10.9 | 545 | 7,063,200 | | | | |
| 2 3/8 | 3.1 | 155 | 2,008,800 | 6 3/4 | 11.2 | 560 | 7,257,600 | | | | |
| 2 1/2 | 3.3 | 165 | 2,138,400 | 6 7/8 | 11.5 | 575 | 7,452,000 | | | | |
| 2 5/8 | 3.5 | 175 | 2,268,000 | 7" | 11.8 | 590 | 7,646,400 | | | | |
| 2 3/4 | 3.6 | 180 | 2,332,800 | 7 1/8 | 12.1 | 605 | 7,840,800 | | | | |
| 2 7/8 | 3.8 | 190 | 2,462,400 | 7 1/4 | 12.4 | 620 | 8,035,200 | | | | |
| 3" | 4.0 | 200 | 2,592,000 | 7 3/8 | 12.6 | 630 | 8,164,800 | | | | |
| 3 1/8 | 4.2 | 210 | 2,721,600 | 7 1/2 | 12.9 | 645 | 8,359,200 | | | | |
| 3 1/4 | 4.4 | 220 | 2,851,200 | 7 5/8 | 12.2 | 660 | 8,553,600 | | | | |
| 3 3/8 | 4.6 | 230 | 2,980,800 | 7 3/4 | 13.5 | 675 | 8,748,000 | | | | |
| 3 1/2 | 4.7 | 235 | 3,045,600 | 7 7/8 | 13.8 | 690 | 8,942,400 | | | | |
| 3 5/8 | 4.9 | 245 | 3,175,200 | 8" | 14 | 700 | 9,072,000 | | | | |
| 3 3/4 | 5.0 | 250 | 3,240,000 | 8 1/8 | 14.3 | 715 | 9,266,400 | | | | |
| 3 7/8 | 5.2 | 260 | 3,369,600 | 8 1/4 | 14.6 | 730 | 9,460,800 | | | | |
| 4" | 5.4 | 270 | 3,499,200 | 8 3/8 | 14.9 | 745 | 9,655,200 | | | | |
| 4 1/8 | 5.7 | 285 | 3,693,600 | 8 1/2 | 15.2 | 760 | 9849,600 | | | | |
| 4 1/4 | 5.9 | 295 | 3,823,200 | 8 5/8 | 15.5 | 775 | 10,044,000 | | | | |

This rating table is based on a curve constructed from four current meter measurements made by E.W. Case in July 1912 and is well defined. The weir was installed in 1911 and first used for measuring draft in 1912. There is a moderate velocity of approach C.H. Lee

12

## WASTE CUYAMACA LAKE

| | Sec Ft per day | Total cu.ft sec day | Draught Sec.Ft. |
|---|---|---|---|
| **April 1906** | | | |
| 2"x 6' 1 day | 1.1 | 1.1 | |
| 3"x 10' 1" | 3.3 | 3.3 | |
| 2½" x 18' 1 Day | 4.6 | 4.6 | |
| 5" x 18' 1 " | 12.6 | 12.6 | |
| 2000 inches thru waste gate 2 days | | 80 | |
| 2½" x 14' 2 days | 3.6 | 7.2 | |
| 1500 inches thru waste gate | | 30 | |
| 2" x 5' 1 day | .9 | .9 | |
| 1000 inches thru waste gate | | 20 | |
| 2" x 12' 17 days | 2.3 | 39 | |
| 500 inches thry waste gate | | 10 | |
| 1½ x 12' 1 day | 1.3 | 1.3 | |
| 3" x 14' 3 days | 4.6 | 4.6 | |
| 1000 inches thru waste gate | | 20 | |
| 2500 " " " " | | 50 | |
| | | 284.6= | |
| | | 569.2 A.Ft. | |
| **May 1906.** | | | |
| 3" x 14' 1 day | 4.7 | 4.7 | |
| 2" x 12' 3 day | 2.2 | 6.6 | |
| 2500 inches thru waste gate | | 50 | |
| 1000 inches thru waste gate | | 20 | |
| 1" x 6' 24 days | .4 | 9.6 | |
| 2" x 12' 3 days | 2.2 | 6.6 | |
| | | 97.5- | |
| | | 195 A.Ft. | |
| **June 1906** | | | |
| 1" x 6' 5 days | .4 | 2.0 | |
| 1½ x 3' 3 days | .1 | .3 | |
| | | 2.3= | |
| | | 4.6 A. Ft. | |
| **March 1907** | | | |
| 1" x 5' 2 days | 0.3 | 0.6 | |
| 1½ x 7' 1 days | 0.77 | .8 | |
| 5" x 18' 1 day | 4.9 | 4.9 Mar 7 - 40 | |
| 8" x 24' 13 days | 34.4 | 447.2 40 | |
| 7" x 22' 2 days | 25.9 | 51.8 | |
| 6" x 20' 2 days | 18.9 | 37.8 | |
| 5" x 18' 2 days | 14.6 | 29.2 | |
| 4" x 16' 1 day | 8.1 | 8.1 | |
| 10" x 35' 5 " | 70.4 | 352.0 | |
| 9" x 30' 1 " | 52.0 | 52.0 | |
| | | 984.4- | |
| | | 1969 A.Ft | 80 - 160 |

Additional Spill See Opposite Page.

WASTE CUYAMACA LAKE

April 1907

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 9" x 60' | 4 days | | | | | | | | |
| 6" x 26' | 3 days | | | | | | | | |
| 8" x 34' | 2 " | | | | | | | | |
| 12" x 23' | 1 " | | | | | | | | |
| 4" x 21' | 1 " | | | | | | | | |
| 8" x 15' | 1 " | | | | | | | | |
| 8" x 13' | 1 " | | | | | | | | |
| 6" x 17' | 2 " | | | | | | | | |
| 4" x 14' | 1 " | | | | | | | | |
| 3" x 11' | 1 " | | | | | | | | |
| 2 5/8" x 10' | 2 days | | | | | | | | |
| 2½" x 9' | 1 " | | | | | | | | |
| 2" x 8' | 1 " | | | | | | | | |
| 1½" x 7' | 4 " | | | | | | | | |
| | 5 " | | | | | | | | |

May 1907.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1½" x 4' | 6 days | | | | | | | | |
| 1" x 5' | 7 " | | | | | | | | |
| ¾" x 23' | 5 " | | | | | | | | |

| Sec. Ft per day | | Total Sec.Ft. day | |
|---|---|---|---|
| 52.0 | | 208 | |
| 41.3 | | 124 | |
| 34.4 | | 69 | |
| 28.7 | | 29 | |
| 24.7 | | 24 | |
| 17.9 | | 18 | |
| 15.0 | | 15 | |
| 11.9 | | 36 | |
| 7.1 | | 7 | |
| 3.7 | | 4 | |
| 2.8 | | 5.6 | |
| 2.3 | | 2.3 | |
| 1.7 | | 6.8 | |
| .47 | | 3.9 | |
| | | 552.6- | |

1105 Acre Ft.

| | | |
|---|---|---|
| 0.37 | 4.6 | |
| .3 | 2.1 | |
| .1 | .5 | |
| | 7.2 | |

14.4 Acre Ft.

/3

14

YIELD OF CUYAMACA RESERVOIR AND RUN-OFF FROM TRIBUTARY DRAINAGE AREA. (12 Sq. Mi.)

Values are in Acre Ft. and were computed from original records at Cuyamaca Reservoir.

| Season Jul 1, to Jun 30th | Draft and *waste from Reservoir | Volume Water in Reservoir July 1 | Reservoir Accumulation or Depletion | Evaporation & Percolation Loss | Total Run Off | Run Off Per Sq Mi | Aggregate Run-off Per Sq Mi | Percent each seasons run -off bears to 19 year mean |
|---|---|---|---|---|---|---|---|---|
| 93-94 | 2438 | 6110 | -3614 | 3653 | 2563 | 214 | 214 | 60 |
| 94-95 | 2565 | 2496 | +5359 | 3973 | 11279 | 941 | 1155 | 266 |
| 95-96 | 2984 | 8855 | -5828 | 4891 | 2152 | 179 | 1334 | 51 |
| 96-97 | 2023 | 3027 | - 362 | 2531 | 4216 | 351 | 1685 | 99 |
| 97-98 | 1741 | 2665 | -2544 | 1627 | 834 | 69 | 1754 | 20 |
| 98-99 | 335 | 121 | - 121 | 258 | 472 | 39 | 1793 | 11 |
| 99-00 | 55 | 0 | 0 | 78 | 260 | 22 | 1815 | 6 |
| 1900-01 | 492 | 0 | +1549 | 971 | 3031 | 253 | 2068 | 72 |
| 01-02 | 1403 | 1549 | - 470 | 1401 | 2351 | 196 | 2264 | 55 |
| 02-03 | 1081 | 1079 | + 207 | 1172 | 2516 | 209 | 2473 | 59 |
| 03-04 | 1237 | 1286 | -1268 | 462 | 492 | 41 | 2514 | 12 |
| 04-05 | 45 | 18 | +5449 | 1337 | 6831 | 568 | 3082 | 160 |
| 05-06 | 3329 | 5467 | +5905 | 3538 | 12780 | 1065 | 4147 | 301 |
| 06-07 | 4742 | 11372 | - 159 | 4569 | 9259 | 772 | 4919 | 218 |
| 07-08 | 2033 | 11213 | -3562 | 4610 | 3201 | 267 | 5186 | 75 |
| 08-09 | 3157 | 7651 | + 530 | 3469 | 7172 | 598 | 5784 | 169 |
| 09-10 | 4210 | 8181 | -2441 | 3316 | 5134 | 428 | 6212 | 121 |
| 1910-11 | 4831 | 5740 | -3908 | 1808 | 2765 | 231 | 6453 | 65 |
| 11-12 | 1485 | 1832 | + 636 | 1495 | 3520 | 293 | 6746 | 83 |
| 12-13 | - | 2468 | - | - | - | - | - | - |
| Period | 2110 | - | - 243 | 2381 | 4250 | 354 | - | |

19 year average run-off = 5.9 Sec. Ft. = 0.49 S.F. per Sq Mi.
19 " " draft & waste 2.9 " "
19 " " loss = 3.3 " "

Loss in storage 56% of run-off. *Total waste in 19 years = 5627 Ac. Ft., 1610 Ac. Ft. in Jan. 1895, 769 Ac. Ft. in Apr to June 1906, and 3248 Ac. Ft. Mar to May 1907. This is 7% of the total 19 year run-off.

MONTHLY DRAFT FROM CUYAMACA.

RESERVOIR & AMT. REACHING DIVERTING DAM.

| Mo. | At Cuyamaca. Sec. Ft. | Ac ft. | At Diverting Dam. Sec Ft | Ac Ft. |
|---|---|---|---|---|
| **1888** | | | | |
| Jan. | (0) No Record to June 18 | | | |
| Feb | (0) Do | | | |
| Mar. | (0) Do | | | |
| Apr. | (0) Do | | | |
| May | (0) Do | | | |
| June | (2.10) | (125.0) | 1.35 | 34.7 |
| July | 2.34 | 144.0 | 1.50 | 92.2 |
| Aug. | 1.64 | 101.0 | 1.00 | 61.4 |
| Sept. | 2.05 | 121.4 | 1.30 | 77.2 |
| Oct. | (0) No Record | | | |
| Nov. | (0) do | | | |
| Dec. | (0) do | | | |
| Year | 0.58 | 491. | 0.43 | 265.5 |
| **1892** | | | | |
| Jan. | No Record to Nov. 12 | | | |
| Feb. | 0 do | | | |
| Mar. | 0 do | | | |
| Apr. | 0 do | | | |
| May | 0 do | | | |
| June | 0 do | | | |
| July | 0 do | | | |
| Aug. | 0 do | | | |
| Sept | 0 do | | | |
| Oct. | 0 do | | | |
| Nov. | 2.77 | 164.5 | 1.90 | 71.5 |
| Dec. | 0 | 0 | 0 | 0 |
| Year | --- | --- | --- | --- |
| **1893** | | | | |
| Jan. | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 |
| Mar. | 0 | 0 | 0 | 0 |
| Apr. | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 |
| June | 5.05 | 300.0 | 3.66 | 225.5 |
| July | 9.45 | 561.0 | 7.50 | 461.0 |
| Aug. | 8.86 | 546.0 | 7.00 | 430.0 |
| Sept. | 5.91 | 351.0 | 4.50 | 267.0 |
| Oct. | 5.15 | 316.0 | 3.90 | 239.5 |
| Nov. | 2.88 | 171.0 | 2.00 | 119.0 |
| Dec. | .76 | 47.0 | 0.25 | 15.4 |
| | 3.17 | 2012.0 | 2.42 | 1760.4 |

| Mo. | At Cuyamaca. Sec Ft | Ac Ft | At Diverting Dam Sec Ft | Ac Ft |
|---|---|---|---|---|
| **1894** | | | | |
| Jan. | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 |
| Mar. | 0 | 0 | 0 | 0 |
| Apr. | .59 | 35.0 | 0.10 | 5.9 |
| May | 3.11 | 191.0 | 2.15 | 132.0 |
| June | 3.33 | 198.0 | 2.35 | 139.5 |
| July | 3.74 | 230.0 | 2.72 | 167.0 |
| Aug. | 3.36 | 225.0 | 2.63 | 161.5 |
| Sept. | 2.83 | 168.0 | 1.95 | 116.0 |
| Oct. | 2.35 | 144.5 | 1.55 | 95.2 |
| Nov. | 1.71 | 101.7 | 1.09 | 64.8 |
| Dec. | .25 | 15.0 | 0 | 0 |
| Year | 1.80 | 1308.2 | 1.21 | 881.9 |
| **1895** | | | | |
| Jan. | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 |
| Mar. | 0 | 0 | 0 | 0 |
| Apr. | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 |
| June | 1.20 | 71.3 | .55 | 32.7 |
| July | 6.34 | 390.0 | 4.90 | 301.0 |
| Aug. | 9.84 | 605.0 | 7.85 | 482.0 |
| Sept | 9.88 | 588.0 | 7.90 | 485.0 |
| Oct. | 7.38 | 451.0 | 5.70 | 350.0 |
| Nov. | .98 | 58.2 | .42 | 24.9 |
| Dec. | .14 | 9.0 | 0 | 0 |
| Year | 2.98 | 2172.0 | 2.28 | 1675. |
| **1896** | | | | |
| Jan. | .40 | 26.0 | 0 | 0 |
| Feb. | .67 | 38.4 | .20 | 11.5 |
| Mar. | .02 | 1.0 | 0 | 0 |
| Apr. | 0 | 0 | 0 | 0 |
| May | 4.47 | 275.0 | 3.35 | 206.0 |
| June | 9.13 | 543.0 | 7.30 | 433.0 |
| July | 9.80 | 603.0 | 7.80 | 479.0 |
| Aug. | 6.12 | 499.0 | 6.40 | 393.0 |
| Sept. | 5.29 | 315.0 | 4.05 | 240.3 |
| Oct. | 3.66 | 225.0 | 2.65 | 163.0 |
| Nov. | 1.50 | 89.2 | 1.10 | 65.4 |
| Dec. | .11 | 7.0 | 0 | 0 |
| | 3.60 | 2621.6 | 32.85 | 1979.7 |



MONTHLY DRAFT FROM CUYAMACA

RESERVOIR & AMT. REACHING DIVERTING DAM.

| Mo. | At Cuyamaca. Sec.Ft | Ac.Ft. | At Diverting Dam. Sec.Ft. | Ac Ft |
|---|---|---|---|---|
| **1897** | | | | |
| Jan. | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 |
| Apr | 0 | 00 | 0 | 0 |
| May | .33 | 20.0 | 0 | 0 |
| Jun | 4.45 | 265.0 | 3.32 | 197.0 |
| July | 6.10 | 375.0 | 4.90 | 301.0 |
| Aug. | 9.00 | 553.0 | 7.15 | 438.0 |
| Sept | 5.12 | 305.0 | 3.90 | 231.0 |
| Oct. | 2.23 | 137.0 | 1.50 | 92.0 |
| Nov | 1.60 | 95.0 | 1.12 | 66.5 |
| Dec. | .03 | 2.0 | 0 | 0 |
| Year | 2.40 | 1752.0 | 1.82 | 1325.5 |
| **1898** | | | | |
| Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 |
| Apr | 1.21 | 72.0 | .60 | 35.6 |
| May | .43 | 26.0 | 0 | 0 |
| Jun | 2.96 | 176.0 | 2.05 | 121.5 |
| July | .82 | 50.0 | 0.30 | 18.4 |
| Aug | 0 | 0 | 0 | 0 |
| Sep | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 0 | 0 |
| Year | 0.45 | 324.0 | 0.25 | 175.5 |
| **1899** | | | | |
| Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 |
| Mar | 1.09 | 67.0 | .52 | 131.9 |
| Apr | 2.69 | 160.0 | 1.85 | 110.0 |
| May | 0.90 | 55.0 | .40 | 25.0 |
| June | .05 | 3.0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 |
| Aug. | 0 | 0 | 0 | 0 |
| Sept. | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 0 | 0 |
| Year | 0.39 | 285.0 | 0.23 | 166.9 |

| Mo. | At Cuyamaca. Sec Ft | Ac ft. | At Diverting Dam Sec ft | Ac ft. |
|---|---|---|---|---|
| **1900** | | | | |
| Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 00 | 0 |
| Apr | .19 | 11.0 | 0 | 0 |
| May | .71 | 44.0 | .15 | 9.2 |
| June | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 |
| Sep | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 00 | 0 |
| Year | .90 | 55.0 | .15 | 9.2 |
| **1901** | | | | |
| Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 |
| Apr | 1.87 | 52.0 | .35 | 20.8 |
| May | 1.62 | 100.0 | .90 | 55.2 |
| Jun | 5.71 | 340.0 | 4.35 | 258.0 |
| July | 8.60 | 512.0 | 3.45 | 211.0 |
| Aug | 7.66 | 456.0 | 6.00 | 368.0 |
| Sep. | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 0 | 0 |
| Year | 2.04 | 1460.0 | 1.25 | 913.0 |
| **1902** | | | | |
| Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 |
| Apr | 0 | 0 | 0 | 0 |
| May | 1.67 | 99.0 | 1.05 | 64.3 |
| Jun | 5.64 | 336.0 | 4.35 | 258. 0 |
| July | 7.12 | 429.0 | 5.60 | 343.0 |
| Aug | 4.32 | 257.0 | 3.20 | 196.0 |
| Sep | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 |
| Dec. | 0 | 0 | 0 | 0 |
| Year | 1.57 | 1121.0 | 1.18 | 861.3 |

MONTHLY DRAFT FROM CUYAMACA

RESERVOIR & AMT. REACHING DIVERTING DAM.

| MO. | At Cuyamaca. Sec Ft | Ac Ft | At Diverting Dam. Sec Ft | Ac Ft | MO. | At Cuyamaca. Sec Ft | Ac Ft | AT Diverting Dam. Sec Ft | Ac Ft |
|---|---|---|---|---|---|---|---|---|---|
| 1903 | | | | | 1906 | | | | |
| Jan | 0 | 0 | 0 | 0 | Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | Mar | 0 | 0 | 0 | 0 |
| Apr | 0 | 0 | 0 | 0 | Apr | 0 | 0 | 0 | 0 |
| May | .09 | 5.0 | 0 | 0 | May | 0 | 0 | 0 | 0 |
| June | 6.55 | 390.0 | 5.05 | 388.0 | June | 0 | 0 | 0 | 0 |
| July | 9.20 | 548.0 | 7.30 | 447.5 | July | 2259 | 159.0 | 1.78 | 109.0 |
| Aug | 6.48 | 398.0 | 5.00 | 306.2 | Aug | 6.06 | 373.0 | 4.65 | 285.0 |
| Sep | 0 | 0 | 0 | 0 | Sep | 5.75 | 342.0 | 4.35 | 258.0 |
| Oct | 0 | 0 | 0 | 0 | Oct | 5.72 | 413.0 | 5.20 | 319.0 |
| Nov | 0 | 0 | 0 | 0 | Nov | 3.48 | 207.0 | 2.50 | 148.0 |
| Dec | 0 | 0 | 0 | 0 | Dec | | | | |
| Year | 1.86 | 1341.0 | 1.45 | 1141.7 | Year | 2.05 | 1494.0 | 1.54 | 1119.0 |
| 1904 | | | | | 1907 | | | | |
| Jan | 0 | 0 | 0 | 0 | Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | March | 0 | 0 | 0 | 0 |
| Apr | 4.38 | 261.0 | 3.30 | 195.5 | Apr | 0 | 0 | 0 | 0 |
| May | .48 | 30.0 | 0 | 0 | May | 0 | 0 | 0 | 0 |
| June | 0 | 0 | 0 | 0 | June | 0 | 0 | 0 | 0 |
| July | 0 | 0 | 0 | 0 | July | 4.24 | 261.0 | 3.15 | 193.0 |
| Aug | 0 | 0 | 0 | 0 | Aug | 7.43 | 457.0 | 5.80 | 356.0 |
| Sep | 0 | 0 | 0 | 0 | Sep | 8.96 | 533.0 | 7.10 | 420.0 |
| Oct | 0 | 0 | 0 | 0 | Oct | 3.46 | 213.0 | 2.50 | 153.0 |
| Nov | 0 | 0 | 0 | 0 | Nov | 1.42 | 84.0 | .78 | 46.4 |
| Dec. | 0 | 0 | 0 | 0 | Dec. | .83 | 51.0 | .25 | 15.3 |
| Year | 0.40 | 291.0 | 0.28 | 195.5 | Year | 2.19 | 1599.0 | 1.63 | 1183.7 |
| 1905 | | | | | 1908 | | | | |
| Jan | 0 | 0 | 0 | 0 | Jan | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | Feb | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | Mar | 0 | 0 | 0 | 0 |
| Apr | 0 | 0 | 0 | 0 | Apr | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | May | .83 | 51.0 | 025 | 15.3 |
| June | .75 | 45.0 | .25 | 14.0 | June | 6.44 | 383.0 | 4.95 | 293.0 |
| July | 9.04 | 556.0 | 7.15 | 438.0 | July | 10.53 | 647.0 | 8.40 | 515.0 |
| Aug | 11.82 | 704.0 | 9.45 | 579.0 | Aug | 10.68 | 656.0 | 8.55 | 524.0 |
| Sep | 11.79 | 701.0 | 9.40 | 556.0 | Sep | 10.68 | 634.0 | 8.55 | 506.0 |
| Oct | 7.91 | 486.0 | 6.22 | 3482.0 | Oct | 8.26 | 509.0 | 6.50 | 399.0 |
| Nov | 1.67 | 99.0 | 1.00 | 59.4 | Nov | 5.17 | 307.0 | 3.90 | 231.0 |
| Dec | .23 | 14.0 | 0 | 0 | Dec | 1.32 | 81.0 | .70 | 42.9 |
| | 3.60 | 2605.0 | 2.79 | 2129.3 | | 4.50 | 2368.0 | 3.48 | 2526.2 |



MONTHLY DRAFT FROM CUYAMACA.

Reservoir & Amt. Reaching Diverting Dam. 6

| Mo. | At Cuyamaca. Sec Ft | Ac Ft | At Diverting Dam. Sec Ft. | Ac Ft | Mo. | At Cuyamaca. Sec Ft | Ac Ft | At Diverting Dam. Sec Ft | Ac Ft |
|---|---|---|---|---|---|---|---|---|---|
| 1909 | | | | | 1912 | | | | |
| Jan. | .93 | 55.0 | | | Jan. | 0 | 0 | 0 | 0 |
| Feb. | 0 | 0 | 0 | 0 | Feb. | 0 | 0 | 0 | 0 |
| Mar. | 0 | 0 | 0 | 0 | Mar. | 0 | 0 | 0 | 0 |
| Apr. | 0 | 0 | 0 | 0 | Apr. | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 0 | May | 0 | 0 | 0 | 0 |
| June | 4.51 | 268.00 | 3.35 | 199.1 | June | 3.09 | 183.5 | 2.20 | 130.2 |
| July | 13.91 | 855.00 | 11.27 | 691.0 | July | 6.05 | 371.0 | 4.65 | 285.0 |
| Aug. | 14.40 | 885.0 | 11.70 | 718.0 | Aug. | No Record | | | |
| Sept | 11.01 | 655.0 | 8.80 | 521.0 | Sept | | | | |
| Oct. | 11.20 | 689.0 | 8.95 | 549.0 | Oct. | | | | |
| Nov. | 4.55 | 259.0 | 3.20 | 189.0 | Nov. | | | | |
| Dec. | .12 | 7.0 | 0 | 0 | Dec. | | | | |
| Year | 5.03 | 3673.0 | 3.942 | 2903.1 | Year | | | | |
| 1910 | | | | | | | | | |
| Jan. | 0 | 0 | 0 | 0 | Jan. | | | | |
| Feb. | 0 | 0 | 0 | 0 | Feb. | | | | |
| Mar. | 0 | 0 | 0 | 0 | Mar. | | | | |
| Apr. | 0 | 0 | 0 | 0 | Apr. | | | | |
| May | 2.34 | 144.0 | 1.55 | 95.1 | May | | | | |
| June | 12.01 | 716.0 | 9.25 | 571.0 | June | | | | |
| July | 17.30 | 1064.0 | 14.10 | 964.0 | July | | | | |
| Aug. | 15.37 | 945.0 | 12.45 | 765.0 | Aug. | | | | |
| Sept | 17.05 | 1014.0 | 13.90 | 825.0 | Sept. | | | | |
| Oct. | 11.33 | 696.0 | 9.10 | 558.0 | Oct. | | | | |
| Nov | 6.99 | 410.0 | 5.35 | 317.0 | Nov. | | | | |
| Dec. | 3.79 | 233.0 | 2.75 | 168.5 | Dec. | | | | |
| Year | 7.17 | 5222.0 | 5.734 | 261.6 | Year | | | | |
| 1911 | | | | | | | | | |
| Jan | 1.28 | 76.0 | .70 | 42.9 | Jan. | | | | |
| Feb. | 0 | 0 | 0 | 0 | Feb. | | | | |
| Mar. | 0 | 0 | 0 | 0 | Mar. | | | | |
| Apr. | 0 | 0 | 0 | 0 | Apr. | | | | |
| May | 1.51 | 90.0 | .90 | 55.2 | May | | | | |
| June | 5.10 | 303.0 | 3.85 | 228.0 | June | | | | |
| July | 8.60 | 512.0 | 5.95 | 366.0 | July | | | | |
| Aug. | 7.62 | 469.0 | 5.90 | 362.0 | Aug. | | | | |
| Sept | 4.89 | 291.0 | 3.70 | 219.0 | Sept. | | | | |
| Oct. | 0.50 | 30.0 | 0.00 | 0.0 | Oct. | | | | |
| Nov. | 0 | 0 | 0 | 0 | Nov. | | | | |
| Dec. | 0 | 0 | 0 | 0 | Dec. | | | | |
| | 2.46 | 1771.0 | 1.751 | 272. | | | | | |

MEAN YEARLY DRAFT FROM CUYAMACA RESERVOIR AT CUYAMACA AND SAN DIEGO FLUME COMPANY, DIVERTING DAM.

| Year | At Cuyamaca Sec Ft | Acre Ft | At Diverting Dam Sec Ft | Acre Ft | Per cent loss |
|---|---|---|---|---|---|
| 1888 | 0.69 | 491 | 0.43 | 265 | 46 |
| 1893 | 3.18 | 2314 | 2.41 | 1760 | 24 |
| 1894 | 1.80 | 1308 | 1.21 | 888 | 32 |
| 1895 | 2.85 | 2172 | 2.88 | 1676 | 23 |
| 1896 | 3.50 | 2622 | 2.74 | 1980 | 25 |
| 1897 | 2.40 | 1758 | 1.82 | 1326 | 25 |
| 1898 | .48 | 324 | .24 | 176 | 46 |
| 1899 | .29 | 295 | .25 | 167 | 41 |
| 1900 | .06 | 55 | .01 | 9 | 84 |
| 1901 | 2.04 | 1460 | 1.25 | 918 | 38 |
| 1902 | 1.57 | 1121 | 1.18 | 861 | 25 |
| 1903 | 1.86 | 1341 | 1.45 | 1142 | 15 |
| 1904 | .43 | 291 | 0.28 | 196 | 33 |
| 1905 | 3.61 | 2605 | 2.79 | 2129 | 18 |
| 1906 | 2.05 | 1494 | 1.54 | 1119 | 25 |
| 1907 | 2.19 | 1599 | 1.62 | 1184 | 26 |
| 1908 | 4.46 | 3268 | 3.49 | 2526 | 23 |
| 1909 | 3.05 | 2378 | 2.94 | 2066 | 22 |
| 1910 | 7.17 | 5222 | 5.73 | 4262 | 18 |
| 1911 | 2.46 | 1771 | 1.78 | 1295 | 27 |
| Mean | 2.42 | 1758 | 1.82 | 1557 | 30. 5 |

Note:- Length of Boulder Cr. Channel, Cuyamaca Reservoir to San Diego River is 12.5 miles. Losses are based on four comperative measurements made August 15th to 16th 1912. From this date and on approximate value for the amount of water which, if liberated at Cuyamaca will be entirely lost in transit to Diverting Dam a percolation diagram was constructed according to the principles developed by the Owens Valley studies of the Los Angles Aqueduct. (See Engineering News) April 21, 1910.

Les-WK
8-19-12



Cuyamaca Water Co. RATING TABLE

San Diego Flume at Diverting Dam ndar Lakeside-1912
Flume Co. Gage

| Gage Inches | Disch Sec.Ft. | Gage Inches | Disch Sec.Ft. | Gage Inches | Disch Sec.Ft. |
|---|---|---|---|---|---|
| 0 | 0 | 9" | 9.4 | 15" | 19.4 |
| 1/4" | 0.1 | 9 1/8 | 9.6 | 15 1/8 | 19.6 |
| 1/2 | 0.1 | 9 1/4 | 9.8 | 15 1/4 | 19.9 |
| 3/4 | 0.2 | 9 3/8 | 10.0 | 15 3/8 | 20.0 |
| 1" | 0.3 | 9 1/2 | 10.2 | 15 1/2 | 20.2 |
| 1 1/4 | 0.4 | 9 5/8 | 10.5 | | |
| 1 1/2 | 0.5 | 9 3/4 | 10.7 | | |
| 1 3/4 | 0.6 | 9 7/8 | 10.9 | | |
| 2" | 0.8 | 10" | 11.1 | | |
| 2 1/4 | 1.0 | 10 1/8 | 11.3 | | |
| 2 1/2 | 1.1 | 10 1/4 | 11.5 | | |
| 2 3/4 | 1.3 | 10 3/8 | 11.7 | | |
| 3" | 1.5 | 10 1/2 | 11.9 | | |
| 3 1/4 | 1.7 | 10 5/8 | 12.1 | | |
| 3 1/2 | 2.0 | 10 3/4 | 12.3 | | |
| 3 3/4 | 2.2 | 10 7/8 | 12.6 | | |
| 4" | 2.4 | 11" | 12.8 | | |
| 4 1/4 | 2.7 | 11 1/8 | 13.0 | | |
| 4 1/2 | 3.0 | 11 1/4 | 13.2 | | |
| 4 3/4 | 3.3 | 11 3/8 | 13.4 | | |
| 5" | 3.6 | 11 1/2 | 13.6 | | |
| 5 1/4 | 4.0 | 11 5/8 | 13.8 | | |
| 5 1/2 | 4.3 | 11 3/4 | 14.0 | | |
| 5 3/4 | 4.6 | 11 7/8 | 14.2 | | |
| 6" | 5.0 | 12" | 14.4 | | |
| 6 1/8 | 5.2 | 12 1/8 | 14.6 | | |
| 6 1/4 | 5.3 | 12 1/4 | 14.8 | | |
| 6 3/8 | 5.5 | 12 3/8 | 15.1 | | |
| 6 1/2 | 5.7 | 12 1/2 | 15.3 | | |
| 6 5/8 | 5.8 | 12 5/8 | 15.5 | | |
| 6 3/4 | 6.0 | 12 3/4 | 15.7 | | |
| 6 7/8 | 6.2 | 12 7/8 | 15.9 | | |
| 7" | 6.4 | 13" | 16.1 | | |
| 7 1/8 | 6.6 | 13 1/8 | 16.3 | | |
| 7 1/4 | 6.7 | 13 1/4 | 16.5 | | |
| 7 3/8 | 6.9 | 13 3/8 | 16.7 | | |
| 7 1/2 | 7.1 | 13 1/2 | 16.9 | | |
| 7 5/8 | 7.3 | 13 5/8 | 17.1 | | |
| 7 3/4 | 7.5 | 13 3/4 | 17.4 | | |
| 7 7/8 | 7.7 | 13 7/8 | 17.6 | | |
| 8" | 7.8 | 14" | 17.8 | | |
| 8 1/8 | 8.0 | 14 1/8 | 18.0 | | |
| 8 1/4 | 8.2 | 14 1/4 | 18.2 | | |
| 8 3/8 | 8.4 | 14 3/8 | 18.4 | | |
| 8 1/2 | 8.6 | 14 1/2 | 18.6 | | |
| 8 5/8 | 8.8 | 14 5/8 | 18.8 | | |
| 8 3/4 | 9.0 | 14 3/4 | 19.0 | | |
| 8 7/8 | 9.2 | 14 7/8 | 19.2 | | |

Computed by A.T.
Checked C.H.L.

This rating table is based on a curve constructed from four current meter measurments made by F. C. Ebert July 12, 1912. It is well defined between Gage heights 0.00 and 12 ins. Above 12 ins. the curve was drawn tangent. Gage heights at the U. S. G. S. gage are all 0.10 ft greater than those at Flume Co. Gage for the same discharge.

## RATING TABLE

San Diego Flume at Diverting Dam near Lakeside. U/ S. Geological Survey Geging Station. 1912.

| | Sec. Ft. | | Sec. Ft. |
|---|---|---|---|
| 1/8" | .052 | 6 1/8" | 4.80 |
| 2/8" | .10 | 6 1/4 | 5.00 |
| 3/8 | .15 | 6 3/8 | 5.19 |
| 4/8 | .21 | 6 1/2 | 5.39 |
| 5/8 | .26 | 6 5/8 | 5.59 |
| 6/8 | .31 | 6 3/4 | 5.79 |
| 7/8 | .36 | 6 7/8 | 5.98 |
| 1" | .42 | 7" | 6.18 |
| 1 1/8 | .46 | 7 1/8 | 6.38 |
| 1/1/4 | .51 | 7 1/4 | 6.59 |
| 1 3/8 | .57 | 7 3/8 | 6.80 |
| 1 1/2 | .62 | 7 1/2 | 8.02 |
| 1 5/8 | .68 | 7 5/8 | 7.24 |
| 1 3/4 | .73 | 7 3/4 | 7.46 |
| 1 7/8 | .78 | 7 7/8 | 7.68 |
| 2" | .83 | 8" | 7.90 |
| 2 1/8 | .89 | 8 1/8 | 8.12 |
| 2 1/4 | .94 | 8 1/4 | 8.34 |
| 2 3/8 | .99 | 8 3/8 | 8.55 |
| 2 1/2 | 1.08 | 8 1/2 | 8.80 |
| 2 5/8 | 1.19 | 8 5/8 | 9.05 |
| 2 3/4 | 1.29 | 8 3/4 | 9.30 |
| 2 7/8 | 1.40 | 8 7/8 | 9.55 |
| 3" | 1.50 | 9" | 9.80 |
| 3 1/8 | 1.60 | 9 1/8 | 10.05 |
| 3 1/4 | 1.71 | 9 1/4 | 10.30 |
| 3 3/8 | 1.81 | 9 3/8 | 10.55 |
| 3 1/2 | 1.92 | 9 1/2 | 10.80 |
| 3 5/8 | 2.0 2 | 9 5/8 | 11.06 |
| 3 3/4 | 2.15 | 9 3/4 | 11.34 |
| 3 7/8 | 2.27 | 9 7/8 | 11.62 |
| 4" | 2.40 | 10" | 11.90 |
| 4 1/8 | 2.53 | 10 1/8 | 12.18 |
| 4 1/4 | 2.65 | 10 1/4 | 12.46 |
| 4 3/8 | 2.78 | 10 3/8 | 12.74 |
| 4 1/2 | 2.90 | 10 1/2 | 13.02 |
| 4 5/8 | 3.03 | 10 5/8 | 13.30 |
| 4 3/4 | 3.15 | 10 3/4 | 13.58 |
| 4 7/8 | 3.29 | 10 7/8 | 13.89 |
| 5" | 3.43 | 11" | 14.20 |
| 5 1/8 | 3.58 | 11 1/8 | 14.51 |
| 5 1/4 | 3.73 | 11 1/4 | 14.82 |
| 5 3/8 | 3.87 | 11 3/8 | 15.13 |
| 5 1/2 | 4.02 | 11 1/2 | 15.44 |
| 5 5/8 | 4.16 | 11 5/8 | 15.75 |
| 5 3/4 | 4.31 | 11 3/4 | 16.06 |
| 5 7/8 | 4.45 | 11 7/8 | 16.38 |
| 6" | 4.60 | 12" | 16.70 |

Note: This rating table is based on a curve constructed from current meter measurements made by F.C.Ebert in May and June, 1912. It is well defined throughout. This curve applies only when water is flowing over the spillway of the dam.

WH.
8-12-12.



## RATING TABLE

Crest of Diverting Dam on San Diego River at Head of San Diego Flume

Prepared July, 1912.

| Depth Inches | Cu. Ftper Sec. Discharge. | Depth Inches | CuFt Per Sec Discharge. |
|---|---|---|---|
| 1/4" | 0.8 | 9 1/4" | 257.1 |
| 1/2 | 3.2 | 9 1/2 | 248.2 |
| 3/4 | 6.8 | 9 3/4 | 259.3 |
| 1" | 6.4 | 10" | 270.4 |
| 1 1/4 | 9.4 | 10 1/4 | 281.5 |
| 1 1/2 | 12.4 | 10 1/2 | 292.6 |
| 1 3/4 | 15.4 | 10 3/4 | 303.7 |
| 2" | 18.4 | 11" | 314.8 |
| 2 1/4 | 22.4 | 11 1/4 | 325.9 |
| 2 1/2 | 26.4 | 11 1/2 | 337.0 |
| 2 3/4 | 30.4 | 11 3/4 | 348.1 |
| 3" | 34.4 | 12" | 359.2 |
| 3 1/4 | 39.6 | 12 1/4 | 370.3 |
| 3 1/2 | 44.7 | 12 1/2 | 381.4 |
| 3 3/4 | 48.7 | 12 3/4 | 392.5 |
| 4" | 55.1 | 13" | 403.6 |
| 4 1/4 | 58.0 | 13 1/4 | 414.7 |
| 4 1/2 | 60.9 | 13 1/2 | 425.8 |
| 4 3/4 | 63.8 | 13 3/4 | 436.9 |
| 5" | 66.7 | 14" | 448.0 |
| 5 1/4 | 77.3 | 14 1/4 | 459.1 |
| 5 1/2 | 88.0 | 14 1/2 | 470.2 |
| 5 3/4 | 97.7 | 14 3/4 | 481.3 |
| 6" | 109.4 | 15" | 492.4 |
| 6 1/4 | 117.5 | 15 1/4 | 503.5 |
| 6 1/2 | 125.8 | 15 1/2 | 514.6 |
| 6 3/4 | 134.3 | 15 3/4 | 525.7 |
| 7" | 142.7 | 16" | 536.8 |
| 7 1/4 | 152.2 | 16 1/4 | 547.9 |
| 7 1/2 | 162.1 | 16 1/2 | 559.0 |
| 7 3/4 | 172.0 | 16 3/4 | 570.1 |
| 8" | 181.8 | 17" | 581.2 |
| 8 1/4 | 193.0 | 17 1/4 | 592.3 |
| 8 1/2 | 203.9 | 17 1/2 | 603.4 |
| 8 3/4 | 214.8 | 17 3/4 | 614.5 |
| 9" | 226.0 | 18" | 625.5 |

This rating table is not based on either current meter measurements or consistent theory and gives very rough results. It may be used during the period 1899 to 1912 prior to the raising of the crest by building on an additional height of 5 ft.

The observations of depth which were made during this period were mostly by eye without the use of a permanent gage or foot rule.

AMOUNT OF WATER DIVERTED

By San Diego Flume at Diverting Dam- Years, 1899 - 1901

| Mo. | From Cuyamaca Sec. Ft. | From Cuyamaca Ac. Ft. | From San Diego R. Sec. Ft. | From San Diego R. Ac. Ft. | T O T A L Sec.Ft. | T O T A L Ac.Ft |
|---|---|---|---|---|---|---|
| 1899 | | | | | | |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 1.7 | 94.0 | 127 | 94. |
| Mar | 5 | 32. | 7.7 | 471. | 8.2 | 503. |
| Apr | 1.8 | 110. | 4.9 | 290. | 6.7 | 400. |
| May | .4 | 25. | 1.9 | 115. | 2.3 | 140. |
| Jun | 0 | | 1. | 57 | 1.0 | 57. |
| Jul | | | 0 | 0 | 0 | 0 |
| Aug | | | 0 | 00 | 0 | 0 |
| Sep | | | 0 | 0 | 0 | 0 |
| Oct | | | 0 | 0 | 0 | 0 |
| Nov | | | 0 | 0 | 0 | 0 |
| Dec | | | 0 | 0 | 0 | 0 |
| Year | 0.2 | 167. | 1.4 | 1027. | 1.7 | 1194. |
| 1900 | | | | | | |
| Jan | | | 1.9 | 116. | 1.9 | 116. |
| Feb | | | 6 | 32. | .6 | 32. |
| Mar | | | 8 | 51. | .8 | 51. |
| Apr | | | 3.0 | 181. | 3.0 | 181. |
| May | .7 | .9 | 4.4 | 192 | 4.6 | 201. |
| Jun | | | 0 | 0 | 0 | 0 |
| Jul | | | 0 | 0 | 0 | 0 |
| Aug | | | 0 | 0 | 0 | 0 |
| Sep | | | 0 | 0 | 0 | 0 |
| Oct | | | 0 | 0 | 0 | 0 |
| Nov | | | 6 | 33. | .6 | 33. |
| Dec | | | .2 | 13. | .2 | 13. |
| Year | .02 | 9. | 1.0 | 618. | 1.0 | 627. |
| 1901 | | | | | | |
| Jan | | | 3. | 182. | 3.0 | 182. |
| Feb | | | 11. | 633. | 11.0 | 633. |
| Mar | | | 10.5 | 646. | 10.5 | 646. |
| Apr | .4 | 21. | 6.3 | 375 | 6.7 | 396. |
| May | .9 | 55. | 4.7 | 289 | 5.6 | 344. |
| Jun | 4.4 | 258. | 1.3 | 79. | 5.7 | 337. |
| Jul | 3.4 | 211. | 3.8 | 231. | 7.2 | 442. |
| Aug | 600 | 368. | 2.4 | 151. | 8.4 | 519. |
| Sep | | | 0 | 0 | | 0 |
| Oct | | | 0 | 0 | | .0 |
| Nov | | | 0 | 0 | | 0 |
| Dec | | | 0 | 0 | | 0 |
| Year | 1.2 | 914.0 | 3.7 | 2586. | 4.8 | 3499. |



AMOUNT OF WATER DIVERTED.

San Diego Flume at Diverting Dam.

| Mo. | From Cuyamaca Sec.Ft. | From Cuyamaca Ac.Ft. | From San Diego R. Sec.Ft. | From San Diego R. Ac.Ft. | T O T A L Sec.Ft. | T O T A L Ac. Ft. |
|---|---|---|---|---|---|---|
| 1902 | | | | | | |
| Jan | | | .3 | 20. | .3 | 20. |
| Feb | | | 1.9 | 106. | 119 | 106. |
| Mar | | | 10.8 | 660. | 10.8 | 660. |
| Apr | | | 9.4 | 558. | 9.4 | 558. |
| May | 1.0 | 64. | 4.2 | 258 | 5.2 | 322. |
| Jun | 4.4 | 258. | 1.3 | 79. | 5.7 | 337. |
| Jul | 5.6 | 343. | .3 | 19. | 5.9 | 362. |
| Aug | 3.2 | 196. | (0) | (0) | 2.8 | 171. |
| Sep | | | 0 | 0 | 0 | 0 |
| Oct | | | 0 | 0 | 0 | 0 |
| Nov | | | 0 | 0 | 0 | 0 |
| Dec. | | | 2.2 | 14. | 2.2 | 14. |
| Year | 1.2 | 861. | 2.5 | 1712. | 3.7 | 2550. |
| 1903 | | | | | | |
| Jan | 0 | 0 | .9 | 58. | 0.9 | 58. |
| Feb | 0 | 0 | 12.6 | 702. | 12.6 | 702. |
| Mar | 0 | 0 | 12.3 | 753. | 12.3 | 753. |
| Apr | 0 | 0 | 12.5 | 744. | 12.5 | 744. |
| May | 0 | 0 | 10.4 | 638. | 10.4 | 638. |
| Jun | 5.0 | 338. | 2. | 25. | 7. | 413. |
| Jul | 7.3 | 448. | (0) | (0) | 7.2 | 439. |
| Aug | 5. | 306. | 0 | (0) | 5. | 304. |
| Sep | 0 | 0 | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 |
| Year | 1.4 | 1142. | 4.2 | 2920. | 5.7 | 4051. |
| 1904 | | | | | | |
| Jan | 0 | 0 | 0 | 0 | 0 | 0 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 3.1 | 188. | 3.1 | 188. |
| Apr | 3.3 | 196. | 2.5 | 151. | 5.8 | 347. |
| May | 0 | 0 | .9 | 57. | .9 | 57. |
| Jun | 0 | 0 | 0 | 0 | 0 | 0 |
| Jul | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 0 | 0 | 0 | 0 | 0 | 0 |
| Sep | 0 | 0 | 0 | 0 | 0 | 0 |
| Oct | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 0 | 0 | 0 | 0 | 0 | 0 |
| Year | 0.3 | 196. | .6 | 396. | .8 | 592. |

AMOUNT OF WATER DIVERTED

By San Diego Flume at Diverting Dam.

| Mo. | From Cuyamaca Sec. Ft. | From Cuyamaca Ac.Ft | From San Diego R. Sec. Ft. | From San Diego R. Ac. Ft. | T o t a l Sec. Ft. | T o t a l Ac. Ft. |
|---|---|---|---|---|---|---|
| 1905 | | | | | | |
| Jan | 0 | 0 | 1.0 | 61. | 1.0 | 61. |
| Feb | 0 | 0 | 11.1 | 613. | 11.1 | 613. |
| Mar | 0 | 0 | 5.2 | 318. | 5.2 | 318. |
| Apr | 0 | 0 | 10.5 | 626. | 10.5 | 626. |
| May | 0 | 0 | 9.5 | 583. | 9.5 | 583. |
| Jun | .2 | 15. | 10. | 591. | 10.2 | 606. |
| Jul | 7.2 | 438. | 1.7 | 110. | 8.9 | 548. |
| Aug | 9.4 | 579. | (0) | (0) | 9. | 550. |
| Sep | 9.4 | 556. | 1.5 | 93. | 10.9 | 649. |
| Oct | 6.2 | 482. | 2.2 | 36. | 8.4 | 518. |
| Nov | 1. | 59. | 1.1 | 66. | 2.1 | 125. |
| Dec | 0 | | 3.1 | 192. | 3.1 | 192. |
| Year | 2.5 | 2129. | 4.8 | 3260. | 7.5 | 5389. |
| 1906 | | | | | | |
| Jan | 0 | 0 | 8.4 | 513. | 8.4 | 513. |
| Feb | 0 | 0 | 8.8 | 489. | 8.8 | 489. |
| Mar | 0 | 0 | 10. | 611. | 10. | 611. |
| Apr | 0 | 0 | 11.3 | 672. | 11.3 | 672. |
| May | 0 | 0 | 9.2 | 568. | 9.2 | 568. |
| Jun | 0 | 0 | 11.9 | 706. | 11.9 | 706. |
| Jul | 1.8 | 109. | 10. | 614. | 11.8 | 723. |
| Aug | 4.6 | 285. | 6.5 | 397. | 11.1 | 682. |
| Sep | 4.4 | 258. | 6.1 | 365. | 10.5 | 623. |
| Oct | 5.2 | 319. | 4.8 | 294. | 10.0 | 613. |
| Nov | 2.5 | 148. | 5.9 | 347. | 8.4 | 495. |
| Dec | 0 | 0 | 4.0 | 245. | 4.0 | 245. |
| Year | 1.5 | 1119. | 8.0 | 5721. | 9.6 | 6940. |
| 1907 | | | | | | |
| Jan | 0 | 0 | 3.2 | 197. | 3.2 | 197. |
| Feb | 0 | 0 | 3.2 | 179. | 3.2 | 179. |
| Mar | 0 | 0 | 4.6 | 279. | 4.6 | 279. |
| Apr | 0 | 0 | 7.3 | 437. | 7.3 | 437. |
| May | 0 | 0 | 8.4 | 519. | 8.4 | 519. |
| Jun | 0 | 0 | 10.3 | 613. | 10.3 | 613. |
| Jul | 3.2 | 193. | 8.1 | 502. | 11.3 | 695. |
| Aug | 5.8 | 356. | 5.6 | 345. | 11.4 | 701. |
| Sep | 7.1 | 420. | 4.0 | 240. | 11.1 | 660. |
| Oct | 2.5 | 153. | 7.1 | 435. | 9.6 | 588. |
| Nov. | .8 | 46. | 5.4 | 314. | 6.2 | 360. |
| Dec | .2 | 15. | 7.7 | 468. | 7.9 | 483. |
| Year | 1.6 | 1183. | 6.2 | 4528. | 7.8 | 5717. |



AMOUNT OF WATER DIVERTED

By San Diego Flume at Diverting Dam.

| Mo. | From Cuyamaca Sec. Ft. | From Cuyamaca Ac. Ft. | From San Diego R. Sec. Ft. | From San Diego R. Ac. Ft. | T o t a l Sec. Ft. | T o t a l Ac. Ft. |
|---|---|---|---|---|---|---|
| 1908 | | | | | | |
| Jan | 0 | 0 | 8.2 | 503 | 8.2 | 503 |
| Feb | 0 | 0 | 7.6 | 436 | 7.6 | 436 |
| Mar | 0 | 0 | 7.5 | 458 | 7.5 | 458 |
| Apr | 0 | 0 | 11.2 | 664 | 11.2 | 664 |
| May | .2 | 15 | 10.6 | 648 | 10.8 | 663 |
| Jun | 5. | 293 | 6.8 | 410 | 11.8 | 703 |
| Jul | 8.4 | 515 | 3.8 | 233 | 12.2 | 748 |
| Aug | 8.6 | 524 | 2.3 | 148 | 10.9 | 672 |
| Sep | 8.6 | 506 | 1.7 | 105 | 10.3 | 611 |
| Oct | 6.5 | 399 | 3.3 | 205 | 9.8 | 604 |
| Nov | 3.9 | 251 | 4.7 | 280 | 8.6 | 511 |
| Dec | .7 | 43 | 4.0 | 248 | 4.7 | 291 |
| Year | 3.5 | 2526 | 5.9 | 4338 | 9.5 | 6864 |
| 1909 | | | | | | |
| Jan | 0 | 0 | 7.7 | 476 | 7.7 | 476 |
| Feb | 0 | 0 | 1.4 | 77 | 1.4 | 77 |
| Mar | 0 | 0 | 3.4 | 208 | 3.4 | 208 |
| Apr | 0 | 0 | 5.7 | 337 | 5.7 | 337 |
| May | 0 | 0 | 11.3 | 692 | 11.3 | 692 |
| Jun | 3.4 | 198 | 6.6 | 397 | 10. | 595 |
| Jul | 1.3 | 691 | 0 | (0) | 10.3 | 630 |
| Aug | 11.7 | 718 | 0 | (0) | 8.4 | 517 |
| Sep | 8.8 | 521 | 0 | (0) | 8.5 | 512 |
| Oct | 9. | 549 | 0 | (0) | 8.2 | 502 |
| Nov | 3.2 | 189 | 3.3 | 198 | 6.5 | 387 |
| Dec | 0 | 0 | 7.9 | 486 | 7.9 | 486 |
| Year | 4.0 | 2866 | 3.1 | 2871 | 7.3 | 5419 |
| 1910 | | | | | | |
| Jan | 0 | 0 | 2.1 | 130 | 2.1 | 130 |
| Feb | 0 | 0 | 5.3 | 295 | 5.3 | 295 |
| Mar | 0 | 0 | 8.1 | 497 | 8.1 | 497 |
| Apr | 0 | 0 | 9.3 | 553 | 9.3 | 553 |
| May | 1.6 | 95 | 9.0 | 554 | 10.6 | 649 |
| Jun | 9.7 | 571 | 1.3 | 84 | 11.0 | 654 |
| Jul | 14.1 | 964 | 0 | (0) | 11.3 | 727 |
| Aug | 12.4 | 763 | 0 | (0) | 12.4 | 763 |
| Sep | 13.9 | 825 | 0 | (0) | 12.2 | 727 |
| Oct | 9.1 | 558 | .7 | 42 | 9.8 | 600 |
| Nov | 5.4 | 317 | 1.9 | 118 | 7.3 | 435 |
| Dec | 2.8 | 168 | 4.3 | 270 | 7.1 | 438 |
| Year | 5.8 | 4261 | 3.5 | 2543 | 8.9 | 6468 |

AMOUNT OF WATER DIVERTED.

By San Diego Flume at Diverting Dam.

| Mo. | From Cuyamaca Sec. Ft. | From Cuyamaca Ac. Ft. | From San Diego R. Sec. Ft. | From San Diego R. Ac. Ft. | Total Sec. Ft. | Total Ac. Ft. |
|---|---|---|---|---|---|---|
| **1911** | | | | | | |
| Jan. | .7 | 43 | 7.4 | 452 | 8.1 | 495 |
| Feb. | | | 7.7 | 426 | 7.7 | 426 |
| Mar. | | | 3.8 | 238 | 3.8 | 238 |
| Apr. | | | 8.1 | 483 | 8.1 | 483 |
| May | .9 | 55 | 8.2 | 504 | 9.1 | 559 |
| June | 3.8 | 228 | 1.9 | 309 | 5.7 | 337 |
| July | 6. | 365 | (0) | (0) | 5. | 306 |
| Aug. | 5.9 | 362 | 0.6 | 34 | 6.5 | 396 |
| Sept. | 3.7 | 219 | 1.1 | 65 | 4.8 | 286 |
| Oct. | .0 | 0 | 0.1 | 9 | .1 | 9 |
| Nov. | | | .0 | 0 | .0 | 0 |
| Dec. | | | 0.2 | 12 | .2 | 12 |
| Year | 1.75 | 1272 | 3.3 | 2532 | 5.0 | 3547 |
| **1912** | | | | | | |
| Jan. | | | 1.3 | 78 | 1.3 | 78 |
| Feb. | | | 1.8 | 102 | 1.8 | 102 |
| Mar. | | | 10.1 | 622 | 10.1 | 622 |
| Apr. | | | 10.7 | 638 | 10.7 | 638 |
| May | | | 8.8 | 540 | 8.8 | 540 |
| June | 2.2 | 130 | 7.0 | 415 | 9.2 | 545 |
| July | 4.6 | 285 | 4.9 | 299 | 9.5 | 584 |
| Aug. | | | | | | |
| Sept. | | | | | | |
| Oct. | | | | | | |
| Nov. | | | | | | |
| Dec. | | | | | | |
| Year | 0.6 | 415 | 3.7 | 269 4 | 4.3 | 3109 |

Lee WK.
8-19-12



DISCHARGE OF SAN DIEGO RIVER AT DIVERTING DAM OF SAN DIEGO FLUME.

Total Drainage Area - 104 Sq. Mi.
Area Excluding Cuyamaca 92 " "

| Season | Net draft & Waste from Cuyamaca Sec. Ft. | Net draft & Waste from Cuyamaca Ac. Ft. | Yield of Drain Area Excluding Cuyamaca Sec. Ft. | Yield of Drain Area Excluding Cuyamaca Ac. Ft. | TOTAL Sec. Ft. | TOTAL Ac. Ft. |
|---|---|---|---|---|---|---|
| 1898-99 | .25 | 185.3 | 1.44 | 1033 | 1.69 | 1218 |
| 1899-00 | .01 | 9.2 | 0.91 | 656 | 0.92 | 665 |
| 1900-01 | .47 | 340.0 | 6.03 | 4360 | 6.50 | 4700 |
| 1901-02 | 1.24 | 901.3 | 6.26 | 4555 | 7.50 | 5456 |
| 1902-03 | 1.26 | 927.0 | 11.95 | 8377 | 13.10 | 9304 |
| 1903-04 | 1.30 | 949.2 | 1.00 | 723 | 2.30 | 1672 |
| 1904-05 | .02 | 14.9 | 30.28 | 22066 | 30.30 | 22081 |
| 1905-06 | 3.99 | 2883. | 46.20 | 33392 | 50.10 | 36275 |
| 1906-07 @ | 6.05 | 4367. | 41.35 | 29946 | 47.40 | 34313 |
| 1907-08 | 2.06 | 1492.0 | 17.44 | 12632 | 19.50 | 14124 |
| 1908-09 | 3.32 | 2400.0 | 28.68 | 20760 | 32.00 | 23160 |
| 1909-10 | 4.60 | 3334.1 | 18.80 | 13629 | 23.40 | 16963 |
| 1910-11 | 5.25 | 3800.0 | 11.55 | 8324 | 16.80 | 12124 |
| 1911-12 | 1.48 | 1076.0 | 22.62 | 16336 | 24.1 | 17412 |
| Period | 2.23 | 1620 | 17.50 | 12628 | 19.64 | 14250 |

@ Includes waste from Cuyamaca Reservoir in 1906, 769 Ac. Ft. and 1907 3248 Ac. Ft.

Lee-WK.
8-20-12

SEASONAL DISCHARGE SAN DIEGO RIVER AT DIVERTING DAM

Exclusive of Cuyamaca Run Off Area of

Drainage -- 92 sq. mi.

| Season Jul. 1 to Jun. 30 | Observed Run Off San Diego River At Diverting Dam Ac. Ft. per Sq Mi | Percent of 13 year mean | Percentage Observed Seasonal run off to 19 yr Mean at Cuyamaca Dam | Computed Run Off San Diego River At Diverting Dam Ac. Ft. per Sq. Mi. | Percent of 19 yr mean | Aggregate Run Off Per Sq Mi for Mass Curve |
|---|---|---|---|---|---|---|
| 1893-1894 | - | - | 60 | 82 | 60 | 82 |
| 1894-1895 | - | - | 266 | 366 | 266 | 448 |
| 1895-1896 | - | - | 51 | 70 | 51 | 518 |
| 1896-1897 | - | - | 99 | 136 | 99 | 654 |
| 1897-1898 | - | - | 20 | 38 | 20 | 692 |
| 1898-1899 | 11 | 8 | 11 | - | - | 703 |
| 1899-1900 | 7 | 5 | 6 | - | - | 710 |
| 1900-1901 | 47 | 35 | 72 | - | - | 757 |
| 1901-1902 | 50 | 36 | 55 | - | - | 807 |
| 1902-1903 | 91 | 66 | 59 | - | - | 898 |
| 1903-1904 | 8 | 6 | 12 | - | - | 906 |
| 1904-1905 | 240 | 174 | 160 | - | - | 1146 |
| 1905-1906 | 363 | 264 | 301 | - | - | 1509 |
| 1906-1907 | 324 | 248 | 218 | - | - | 1833 |
| 1907-1908 | 137 | 100 | 75 | - | - | 1970 |
| 1908-1909 | 225 | 164 | 169 | - | - | 2195 |
| 1909-1910 | 148 | 108 | 121 | - | - | 2343 |
| 1910-1911 | 91 | 66 | 65 | - | - | 2434 |
| 1911-1912 | 176 # | 130 | 83 | - | - | 2610 |
| Mean | ø 137 * | | 100 | | | |

* The 14 year observed mean at Cuyamaca for seasons 1898 to 1911-12 equals that for the 19 season period 1893-94 to 1911-12. Hence assumed same relation at Diverting Dam.

ø 137 Ac. Ft. per Sq Mi = 0.19 S.F. per Sq Mi, Average total yield = 17.8 S.F.

\# The accurracy of this value is questioned. The April floods were allowed to pass through the waste gates of the dam and were observed and reported upon by an inexperienced gate tender. His estimates vary from 1600 to 15000 M.I. during the month, the latter exceeding the capacity of the gates.



AMOUNT OF WATER DIVERTED BY SAN DIEGO FLUME AT DIVERTING DAM.

| Year | From Cuyamaca Res/ Ac. Ft. | From San Diego R. Sec. Ft. Days | Total Sec. Ft. Days | Pumping Ac. Ft. |
|---|---|---|---|---|
| 1899 | 0/2 | 1.4 1027 | 1.7 1.75 | 1194 |
| 1900 | 0.02 | 1.0 618 | 1.0 2.58 | 627 |
| 1901 | 1.2 | 3.7 2586 | 4.8 0.89 | 3499 |
| 1902 | 1.2 | 2.5 1712 | 3.7 .90 | 2550 |
| 1903 | 1.4 | 4.2 2920 | 5.7 1.18 | 4051 |
| 1904 | 0.3 | 0.6 396 | 0.8 1.80 | 592 |
| 1905 | 2.8 | 4.8 3260 | 7.5 ./ 0 | 5389 |
| 1906 | 1.5 | 8.0 5721 | 9.6 | 6940 |
| 1907 | 1.6 | 6.3 4538 | 7.8 | 5717 |
| 1908 | 3.5 | 5.9 4338 | 9.5 | 6864 |
| 1909 | 4.0 | 3.1 2671 | 7.3 | 5419 |
| 1910 | 2.9 | 3.5 2543 | 5.9 | 6468 |
| 1911 | 1.75 | 3.3 2932 | 5.0 | 3547 |
| 1912 | - | - | - | - |
| Mean | 1.95 | 1435 | 3.72 2700 | 5.64 6.4 4060 |

Note:- Totals computed from Company records at Diverting Dam.

Cuyamaca computed from revised Company records at the Cuyamaca weir corrected for losses in Boulder Cr. San Diego computed by subtracting Cuyamaca from totals.

Lee-WK.
8-20-12.

Table 31.

AMOUNT OF WATER DELIVERED TO SAN DIEGO FLUME BY MONTE ND CAPITAN PUMPING PLANTS.

| Mo. | Monte Sec.Ft. | Monte Ac.Ft. | Capiten Sec.Ft. | Capiten Ac.Ft. | Total Sec.Ft. | Total Ac.Ft. | Monte Sec.Ft. | Monte Ac.Ft. | Capiten Sec.Ft. | Capiten Ac.Ft. | Total Sec.Ft. | Total Ac.Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1899 | | | | | | | 1901 | | | | | |
| Jan | | | | | 0 | 0 | .28 | 17.1 | .36 | 22.2 | .64 | 39.3 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | .82 | 50.0 | 0 | 0 | .82 | 50.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr | .95 | 56.6 | 0 | 0 | .95 | 56.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 1.64 | 100.8 | 0 | 0 | 1.64 | 100.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jun | 1.23 | 73. | .75 | 44.5 | 1.98 | 117.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jul | .19 | 11.8 | 0 | 0 | .19 | 11.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | .86 | 52.9 | 1.6 | 98.4 | 2.46 | 151.3 | 0 | 0 | 2.62 | 160.7 | 2.62 | 160.7 |
| Sep | 1.53 | 90.6 | 2.62 | 156. | 4.15 | 246.6 | .98 | 58.1 | 2.21 | 131.5 | 3.19 | 189.6 |
| Oct | 1.37 | 84.1 | 2.49 | 153. | 3.86 | 237.1 | 1.00 | 64. | 1.64 | 101. | 2.64 | 165.0 |
| Nov | .50 | 29.8 | 2.12 | 126.2 | 2.62 | 156.0 | .49 | 29.2 | .54 | 31.8 | 1.03 | 61.0 |
| Dec | .47 | 29. | 1.85 | 113.2 | 2.32 | 142.2 | .20 | 12.2 | .33 | 20.2 | .53 | 32.4 |
| Year | 9.56 | 578.6 | 11.43 | 691.3 | 20.99 | 1269.9 | 2.95 | 180.6 | 7.70 | 467.4 | 10.65 | 648.0 |
| Mean | 0.8 | 48.2 | .95 | 57.6 | 1.75 | 105.8 | .24 | 15.9 | .64 | 39.0 | .89 | 54.0 |
| | | | 1900 | | | | | | 1902 | | | |
| Jan | 0 | 0 | .63 | 38.8 | .63 | 38.8 | .08 | 4.9 | 1.43 | 88.0 | 1.51 | 92.9 |
| Feb | .47 | 27.2 | 1.88 | 107.7 | 2.35 | 134.9 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | .98 | 6044 | 1.81 | 111.0 | 2.79 | 171.4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr | .65 | 38.8 | 1.74 | 103.8 | 2.39 | 142.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | .05 | 2.9 | .50 | 30.8 | .55 | 33.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jun | 1.06 | 63. | 2.24 | 133. | 3.30 | 196.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jul | 1.12 | 68.8 | 1.77 | 108.5 | 2.89 | 177.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | 2.15 | 132. | 2.16 | 133.0 | 4.31 | 265.0 | 0 | 0 | 1.05 | 64.3 | 1.05 | 64.3 |
| Sep | 2.09 | 124. | 1.98 | 117.6 | 4.07 | 241.6 | .70 | 41.5 | 2.42 | 143.2 | 3.12 | 184.7 |
| Oct | 1.81 | 111.0 | 1.81 | 110.9 | 3.62 | 221.9 | .68 | 42. | 2.32 | 142.3 | 3.00 | 184.3 |
| Nov | 1.21 | 72.1 | 1.00 | 59.4 | 2.21 | 131.5 | .62 | 36.6 | 1.22 | 72.4 | 1.84 | 109. |
| Dec | 1.26 | 77.6 | .64 | 39.3 | 1.90 | 116.9 | .02 | 1.7 | .33 | 20.5 | .35 | 22.2 |
| Year | 12.85 | 777.8 | 18.16 | 1093.3 | 31.0 | 1871.1 | 2.10 | 126.7 | 8.77 | 530.7 | 10.87 | 657.4 |
| Mean | 1.07 | 64.8 | 1.51 | 91.1 | 2.58 | 155.9 | .18 | 10.6 | .73 | 44.2 | .905 | 54.8 |

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Table 31A.

AMOUNT OF WATER DELIVERED TO SAN DIEGO FLUME MONTE ND CAPITAN PUMPING PLANTS.

| Mo. | Monte Sec.Ft. | Monte c.Ft. | Capiten Sec.Ft. | Capiten Ac. Ft. | Total Sec.Ft. | Total Ac. Ft. | Monte Sec.Ft. | Monte Ac.Ft. | Capiten Sec.Ft. | Capiten Ac. Ft. | Total Sec.Ft. | Total Ac.Ft. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1903 | | | | | | | 1905 | | | | | |
| Jan | 0 | 0 | 0.42 | 25.6 | 0.42 | 25.6 | | | | | | |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Apr | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| May | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Jun | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Jul | 0 | 0 | 0 | 0 | 0 | 0 | N O T H I N G | | | | | |
| Aug | 0.33 | 20.2 | 0.24 | 14.9 | .57 | 35.1 | | | | | | |
| Sep | 1.64 | 97.3 | 1.98 | 114.8 | 3.62 | 212.1 | | | | | | |
| Oct | 1.61 | 101.2 | 2.00 | 122.5 | 3.61 | 223.7 | | | | | | |
| Nov | 1.34 | 79.4 | 2.04 | 121.2 | 3.38 | 200.6 | | | | | | |
| Dec | 1.16 | 70.9 | 1.38 | 84. | 2.54 | 155.5 | | | | | | |
| Year | 6.08 | 369.0 | 8.06 | 481.6 | 14.14 | 852.6 | | | | | | |
| Mean | .51 | 30.7 | .67 | 40.1 | 1.18 | 71. | | | | | | |
| | | | 1904 | | | | | | 1906 | | | |
| Jan | 1.03 | 63.3 | 1.30 | 79.8 | 2.28 | 143.1 | .40 | 24.6 | 0 | 0 | .40 | 24.6 |
| Feb | 0.69 | 39.6 | 1.15 | 66.0 | 1.84 | 105.6 | .20 | 11.8 | 0 | 0 | .20 | 11.8 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr | 0.32 | 19.2 | 0.79 | 47.0 | 1.11 | 66.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 1.17 | 72.0 | 2.30 | 141.0 | 3.47 | 213.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jun | 1.46 | 87.0 | 2.17 | 129.2 | 3.63 | 216.2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jul | 1.00 | 61.6 | 1.55 | 95.0 | 2.55 | 156.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aug | .05 | 3.01 | 1.36 | 83.5 | 1.41 | 86.51 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sep | 0.34 | 20.4 | 1.40 | 83.2 | 1.74 | 103.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oct | .14 | 8.8 | .59 | 36.2 | 0.73 | 45.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nov | .10 | 6.08 | 1.21 | 72.0 | 1.31 | 78.08 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dec | 1.04 | 64.1 | 0 | 0 | 1.04 | 64.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Year | 7.34 | 445.09 | 13.82 | 829;8 | 21.61 | 1278.0 | .60 | 36.4 | 0 | 0 | .60 | 36.4 |
| Mean | .61 | 37.1 | 1.15 | 69.1 | 1.80 | 107. | | | | | .05 | 3. |

31A

Year 1909.

ACTUAL WATER CONSUMPTION FROM SAN DIEGO FLUME SYSTEM

VALUE IN MILLION GALLONS

| Month | Flume | High Service | Low Service | Total |
|---|---|---|---|---|
| January | 44.73 | 17.84 | 5.23 | 67.80 |
| February | 23.09 | 7.82 | 2.13 | 32.04 |
| March | 20.25 | 9.39 | 3.13 | 32.77 |
| April | 47.33 | 27.01 | 6.96 | 81.30 |
| May | 76.26 | 46.71 | 16.27 | 139. 24 |
| June | 70.30 | 49.33 | 17.52 | 137. 25 |
| July | 69.02 | 53.07 | 17.96 | 140. 05 |
| August | 65.88 | 52.54 | 18.25 | 136.67 |
| September | 63.04 | 51.69 | 17.13 | 131.86 |
| October | 63.66 | 48.89 | 16.31 | 128. 80 |
| November | 56.88 | 24.46 | 7.85 | 89. 19 |
| December | 38.11 | 4.89 | 2.74 | 45. 74 |
| Total | 637.49 | 393. 64 | 131.58 | 1162. 71 |
| Continuous Miner Inches | 135 | 84 | 28 | 247 |
| Maximum Miner Inches | July | | | 350 |



Year 1910

ACTUAL WATER CONSUMPTION FROM SAN DIEGO FLUME SYSTEM

VALUE IN MILLION GALLONS

| Month | Flume | High Service | Low Service | Total |
|---|---|---|---|---|
| January | 34.79 | 4.50 | 3.18 | 42.46 |
| February | 11.98 | 9.40 | 5.56 | 26.94 |
| March | 26.62 | 31.40 | 8.04 | 66.06 |
| April | 68.93 | 20.51 | 7.82 | 97.26 |
| May | (65.30) | (45.15) | (12.25) | (122.70) |
| June | 66.35 | 55.93 | 18.83 | 141.11 |
| July | 67.59 | 55.14 | 18.47 | 141.20 |
| August | 67.01 | 58.53 | 19.98 | 145.52 |
| September | 64.60 | 59.55 | 18.70 | 142.85 |
| October | 62.82 | 49.77 | 13.46 | 126.05 |
| November | 54.06 | 32.06 | 7.45 | 93.57 |
| December | 59.56 | 43.48 | 10.49 | 113.53 |
| Total | 663.71 | 471.72 | 141.21 | 1246.64 |
| Continuous Miner Inches | 154 | 101 | 30 | 285 |
| Maximum Miner Inches | August | | | 362 |

Values in parentheses estimated.

Year 1911.

ACTUAL WATER CONSUMPTION FROM SAN DIEGO FLUME SYSTEM

VALUES IN MILLION GALLONS.

| Month | Flume | High Service | Low Service | Total |
|---|---|---|---|---|
| Januray | 42.16 | 18.57 | 4.94 | 70.67 |
| February | 38.08 | 6.67 | 1.84 | 46.59 |
| March | 28.99 | 10.62 | 2.66 | 42.27 |
| April | 43.94 | 29.91 | 7.80 | 81.65 |
| May | 73.34 | 52.71 | 16.80 | 142.85 |
| June | 52.53 | 46.68 | 17.80 | 117.61 |
| July | 64.58 | 55.92 | 16.18 | 136.68 |
| August | 64.96 | 58.43 | 17.83 | 141.22 |
| September | 45.72 | 44.98 | 15.87 | 106.57 |
| Ocotber | No water | 27.35 | 14.19 | 41.54 |
| November | No water | 23.10 | 8.66 | 31.76 |
| December | No water | 17.02 | 3.70 | 20.72 |
| Total | 459.30 | 391.96 | 138.27 | 979.53 |
| Continuous Miner Inches | 98 | 83 | 27 | 208 |
| Maximum Miner Inches | May | | | 357 |



Year 1912.

ACTUAL WATER CONSUMPTION FROM SAN DIEGO FLUME SYSTEM

VALUES IN MILLION GALLONS

| Month | Flume | High Service | Low Service | Total |
|---|---|---|---|---|
| January | No water | 7.89 | 2.56 | 10.45 |
| February | No water | 9.81 | 3.97 | 13.78 |
| March | 25.81 | 13.67 | 2.96 | 42.44 |
| April | 30.22 | 16.10 | 3.66 | 49,98 |
| May | 57.27 | 37.60 | 7.69 | 102.56 |
| June | 60.72 | 55.26 | 16.21 | 132.19 |
| July | | | | |
| August | | | | |
| September | | | | |
| October | | | | |
| November | | | | |
| December | | | | |
| Total | 174.02 | 140.33 | 37.05 | 351.40 |
| Continuous Miner Inches/ | 74 | 60 | 16. | 150 |
| Maximum Miner Inches | June | | | 341 |

/ Computed for 182 days.

CLASSIFICATION OF CONSUMPTION FROM SAN DIEGO FLUME SYSTEM

Values in Miners Inches.

| SERVICE AND CLASS OF USE | Year '10 Continuous Delivery | Year '10 Maximum Monthly Delivery | Year 1911 Continuous Deliv. | Year 1911 Maximum Monthly Del. |
|---|---|---|---|---|
| Flume: | | | | |
| Domestic retail | 2.3 | 4.6 | 2.3 | 4.6 |
| Irrigation | 131 .7 | 164.4 | 95.7 | 178.4 |
| High Service: | | | | |
| Domestic retail | 0.5 | 1.0 | 0.6 | 0.9 |
| Domestic wholesale | 10.3 | 18.3 | 9.7 | 17.8 |
| Irrigation | 90.2 | 129.7 | 72.8 | 127.2 |
| Low Service: | | | | |
| Domestic Retail | 1.2 | 2.4 | 1.3 | 2.3 |
| Irrigation | 28.8 | 47.6 | 25.7 | 41.7 |
| Total Domestic retail | 4.0 | - | 4.1 | - |
| Total Domestic Wholesale | 10.3 | - | 9.7 | - |
| Total Irrigation | 250.7 | - | 194.2 | - |
| Grand Total | 265.0 | - | 208.0 | - |

Maximum delivery from flume high service and low service occured in differnet months, hence total of maximum in this table greater than actual maximum monthly delivery for years 1910 & 1911.



Table 37.

TABLE OF DUTY OF WATER AS NOW IN USE.

| Distributing System & Year | Area Irrigated in acres. | Continuous use Miners Inches | Continuous use Acres per M.I. | Maximum Use in one month Miners inches | Maximum Use in one month Acres per M.I. |
|---|---|---|---|---|---|
| Flume | 1759 | | | | |
| 1910 | | 131.7 | 13.4 | 164.6 | 10.7 |
| 1911 | | 95.7 | 18.4 | 178.4 | 9.8 |
| High Serv. | 1706 | | | | |
| 1910 | | 90.2 | 18.9 | 129.7 | 13.2 |
| 1911 | | 72.8 | 23.4 | 127.3 | 13.4 |
| Low Serv | 413 | | | | |
| 1910 | | 28.8 | 14.7 | 47.6 | 8.9 |
| 1911 | | 25.7 | 16.4 | 41.7 | 10.1 |

Note:

Prepared by W. B. Post - August 20, 1912.

Data for Curve -- 1.010.

Giving.

Domestic and Irrigation Demand for Spring Valley.
(Gallons)

| Mo. | 1908 | 1909 | 1910 | 1911 |
|---|---|---|---|---|
| Jan | 4,385,025 | 3,668,950 | 1,433,400 | 5,377,200 |
| Feb | 2,391,226 | 2,390,025 | 2,509,725 | 2,841,675 |
| Mar | 3,418,450 | 3,161,725 | 3,628,800 | 4,505,325 |
| Apr | 5,983,275 | 6,715,950 | 6,820,125 | 8,021,625 |
| May | 6,436,375 | 9,947,550 | 11,063,325 | 10,627,125 |
| Jun | 7,575,900 | 10,705,275 | 10,904,475 | 9,525,150 |
| Jul | 7,980,300 | 11,380,725 | 8,506,050 | 11,043,150 |
| Aug | 8,513,050 | 10,312,050 | 12,776,850 | 12,047,100 |
| Sep | 8,300,800 | 11,449,350 | 12,927,900 | 7,814,175 |
| Oct | 8,751,750 | 10,951,050 | 13,522,575 | 5,111,325 |
| Nov | 7,307,575 | 5,721,000 | 8,006,700 | 3,879,825 |
| Dec. | 4,955,400 | 1,599,825 | 9,377,625 | 2,445,350 |
| Total Gallons | 75,337,126 | 87,053,475 | 104,477,550 | 84,239,025 |
| Mean | 6,280,000 | 7,254,000 | 8,706,000 | 7,020,000 |



Data for Curve -- 1.009.

Giving

Domestic and Irrigation Demand for Lemon Grove

(Gallons)

| Mo. | 1908 | 1909 | 1910 | 1911 |
|---|---|---|---|---|
| Jan | 9,394,125 | 8,715,300 | 1,538,850 | 5,951,250 |
| Feb | 3,438,925 | 3,411,900 | 2,501,550 | 1,914,975 |
| Mar | 10,541,550 | 4,612,125 | 12,605,875 | 2,730,550 |
| Apr | 18,825,450 | 12,571,575 | 8,227,275 | 11,922,975 |
| May | 20,792,175 | 19,509,075 | 21,875,475 | 16,344,275 |
| Jun | 19,481,325 | 20,483,025 | 22,846,200 | 15,615,125 |
| Jul | 22,593,225 | 20,642,400 | 24,082,725 | 21,655,050 |
| Aug | 22,921,950 | 20,497,050 | 24,305,200 | 22,042,425 |
| Sep | 21,256,050 | 20,121,900 | 23,664,830 | 18,020,250 |
| Oct | 19, 978,800 | 20,275,275 | 20,097,850 | 9,995,175 |
| Nov | 19,268,250 | 11,040,675 | 16,351,875 | 11,152,800 |
| Dec | 5,856,225 | 875,575 | 19,795,575 | 8,834,250 |
| Total Gallons | 194,398,050 | 162,755,875 | 198,880,280 | 148,739,100 |
| Mean | 16,200,000 | 13,562,990 | 16,567,000 | 12,400,000 |

Contract is for 40,625 Miners Inches. If continuous this is 627,262,500 gallons.

Table 40.

PRELIMINARY CLASSIFICATION OF ACRRAGE LISTED IN CONTRACTS.

| Distributing System | Area Irrigated | | | | | | | | Area not irrigated | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Domestic | Citrus | Tomatoes | Berries | Vegetables | Alfalfa | Olives | Deciduous | Barley & Grapes | Uncultivated | |
| Flume | 112 | 1311 | 0 | 58 | 84 | 112 | 110 | 84 | 1246 | 2775 | 5892 |
| High service | 746 | 1268 | 12 | 6 | 60 | 0 | 320 | 40 | 140 | 912 | 3504 |
| Low service | 52 | 290 | 14 | 8 | 57 | 3 | 2 | 49 | 61 | 144 | 680 |
| Total | 910 | 2869 | 26 | 72 | 201 | 115 | 432 | 173 | 1447 | 3831 | 10076 |
| Per cent | 9.1 | 28.5 | 0.3 | 0.7 | 2.0 | 1.1 | 4.3 | 1.7 | 14.4 | 37.9 | 100 |

Note:- Prepared by W. S. Post - August 20, 1912.

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COMPUTATION OF SAFE YIELD OF SAN DIEGO FLUME SYSTEM.

Charles H. Lee, Hydraulic Engineer.

The safe yield of the system is the amount of water which can be supplied to the consumers from year to year without danger of serious shortage in periods of drought. For domestic consumption alone this should be basedon the yield during the dryest period of years on record. For irrigation consumption in Southern California it can be based on the yield during the ordinary dry year or period of years without serious injury.

The safe yield of the Cuyamaca drainage area of 13 sq. mi. is here based on the run-off during the period 1896-7 to 1904-5 as regulated by 11400 ac. ft. storage capacity in Cuyamaca Reservoir.

The safe yield of San Diego River drainage above diverting Dam exclusive of Cuyamaca is here based on the run-off of the year 1902, which was 36% of normal as regulated by 1600 ac. ft. of storage in La Mesa, Eucalyptus and Murray Hill Reservoirs.

1. Cuyamaca Basin 12 sq. mi.

   Safe yield from mass curve of gross run-off (Diagram 1. 14B)

   0.31 sec. ft. per sq. mi. 3.72 sec. ft total.

   Loss in storage of 56% 2.08 sec. ft.

   Net amount available for draft 1.64 sec. ft.

   Loss in Boulder Co. of 30% 0.49 sec. ft.

   Net amount available at Diverting Dam. 1.15 sec. ft.--58 M.I.

2. San Diego River 92 sq. mi.

Safe yield from mass curve of run-off. 0.043 sec. ft. per sq. mi.--
3.96 sec. ft. -- 198 M.I.

3. Total safe yield at Diverting Dam-- 256 M.I.

Loss in distribution of 25% 64 M.I.

Net amount available for consumers at meter -- 192 M.I.

DISCHARGE AND RUN OFF IN SEC. FT. SAN DIEGO RIVER AT FOUR STATIONS.

| SEASONS 1911-12 | Diverting Dam Flume | Diverting Dam Surplus River Flow | Lakeside Surplus River Flow | Near Santee River Flow | Near Santee Diff with Lakes Surp | Near San Diego River into Ocean | Near San Diego Flow diff with Santee |
|---|---|---|---|---|---|---|---|
| July | 5.0 | 0 | 0 | 0* | 0* | 0* | 0* |
| Aug | 6.5 | 0 | 0 | 0* | 0* | 0* | 0* |
| Sept | 4.8 | 0 | 0 | 0* | 0* | 0* | 0* |
| Oct | 0.1 | 0 | 0 | 0* | 0* | 0* | 0* |
| Nov | 0 | 0 | 0 | 0* | 0* | 0* | 0* |
| Dec | 0.2 | 0 | 0 | 0* | 0* | 0* | 0* |
| Jan | 1.3 | 0 | 0 | 0* | 0* | 0* | 0* |
| Feb | 1.8 | 0 | 0* | 0* | 0* | 0* | 0* |
| Mar | 10.1 | 50.3 | 77.5 r-674 | 78.3* | +0.8* | 81.5* | +3.2* |
| Apr | 10.7 | 158.8 | 121.5 r-2.80 | 121.0* | -0.5* | 135* | +14.0* |
| May | 8.6 [a] | 22.0 | 35.0 | 39.0 | +4.0 | 41 | +2 |
| June | 9.2 | 0.1 | 0.5 | 3 | +2.5 | 0 | -3 |
| Total | 66.5 | 231.2 | 234.5 | 241.3 | +6.8 | 257.5 | +16.2 |
| Mean | 4.87 | 19.21 | 19.5 | 20.1 | +.566 | 21.41 | +1.35 |
| Total for season Ac. Ft. | 3,640 | 13,900 | 14,150 | 14,560 | +410 | 15,520 | 960 |

Note: Values marked * are interpolated by proportion from Diverting Dam and Lakeside discharges. - r = ratio between months of known discharge.

[a] 23.5 from Cuyamaca W Co - gal daily reduced to sec ft Huttons formula.
30.6 U S Rating table and gage heights
8.8 Cuyamaca W. Co. rating table and gage heights.

~~1911 record San Diego River at Lakeside not available.~~

PROPORTION OF TOTAL CONSUMPTION SOLD AS EXCESS WATER.

Values in Miner's Inches.

| Month & Year | Contract Sales | Excess Sales | Total | Excess Sales as % of Total Sales |
|---|---|---|---|---|
| 1911 | | | | |
| Jan | 176.5 | 0.1 | 176.6 | 0 |
| Feb | 129.1 | 0 | 129.1 | 0 |
| Mar | 105.7 | 1.3 | 107.0 | 1.2 |
| Apr | 210.8 | .1 | 210.9 | 0 |
| May | 348.0 | 9.6 | 357.6 | 2.7 |
| Jun | 296.5 | 5.5 | 302.0 | 1.8 |
| Jul | 335.0 | 6.9 | 341.9 | 2.0 |
| Aug | 344.7 | 8.3 | 353.0 | 2.3 |
| Sep | 274.0 | 1.0 | 275.0 | .4 |
| Oct | 103.3 | 0.5 | 103.8 | .5 |
| Nov | 81.1 | 0.8 | 81.9 | .1 |
| Dec | 51.3 | .4 | 51.7 | .1 |
| Year | 205.0 | 2.7 | 207.7 | 0.92 |
| 1912 | | | | |
| Jan | 25.8 | .3 | 26.1 | .1 |
| Feb | 35.3 | 1.5 | 3618 | 4.1 |
| Mar | 105.4 | 0.6 | 106.0 | .6 |
| Apr | 122.9 | 6.1 | 129.0 | 4.7 |
| May | 251.2 | 5.2 | 256.4 | 2.0 |
| Jun | 327.6 | 13.3 | 340.9 | 3.9 |
| 6 mo. period | 144.7 | 4.5 | 149.2 | 1.28 |

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PROPORTION OF TOTAL CONSUMPTION SOLD AS EXCESS WATER.

Values in Miner's Inches.

| Month & Year | Contract Sales | Excess Sales | Total | Excess Sales as % of total Sales |
|---|---|---|---|---|
| 1909 | | | | |
| Jan | 169.5 | 0 | 169.5 | 0 |
| Feb | 88.7 | 0 | 88.7 | 0 |
| Mar | 82.0 | 0 | 82.0 | 0 |
| Apr | 209.3 | 0.2 | 209.5 | 0.1 |
| May | 336.1 | 12.6 | 348.7 | 3.6 |
| Jun | 325.8 | 29.0 | 354.8 | 8.2 |
| Jul | 334.0 | 15.8 | 349.8 | 4.5 |
| Aug | 324.0 | 17.3 | 341.3 | 5.1 |
| Sep | 326.0 | 14.0 | 340.0 | 4.1 |
| Oct | 313.0 | 9.0 | 322.0 | 2.8 |
| Nov | 228.8 | 1.2 | 230.0 | .5 |
| Dec | 113.8 | .7 | 114.5 | .6 |
| Year | 237.5 | 8.3 | 245.8 | 2.46 |
| 1910 | | | | |
| Jan | 78.6 | 0 | 78.6 | 0 |
| Feb | 69.0 | 0 | 69.0 | 0 |
| Mar | 165.0 | 0 | 165.0 | 0 |
| Apr | 250.2 | 0.2 | 250.4 | .0 |
| May | (304.7) | (11.6) | (316.3) | 5.7 |
| Jun | 336.0 | 28.1 | 364.1 | 7.7 |
| Jul | 330.4 | 22.8 | 353.2 | 6.5 |
| Aug | 355.5 | 28.4 | 363.9 | 7.8 |
| Sep | 341.3 | 26.6 | 367.9 | 7.2 |
| Oct | 293.5 | 21.5 | 315.0 | 6.8 |
| Nov | 241.1 | 0.2 | 241.3 | 0 |
| Dec | 281.4 | 1.6 | 283.0 | .6 |
| Year | 244.0 | 20.4 | 264.4 | 3.36 |

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# Ed Fletcher Papers

# 1870-1955

# MSS.81

# Box: 39 Folder: 6

# Business Records - Reports - Lee, Charles H - "Present Yield and Actual Consumption of the Flume System"