DEPARTMENT OF PUBLIC WORKS

STATE OF CALIFORNIA

REPORT OF THE

DIVISION OF WATER RESOURCES

Edward Hyatt, State Engineer.

REPORT ON WATER MASTER SERVICE ON LITTLE SHASTA RIVER SISKIYOU COUNTY, CALIFORNIA DURING SEASON OF 1929.

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By: A. S. Wheeler, Water Master

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Sacramento, California

March 1930

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March 13, 1930

Mr. Edward Hyatt
State Engineer
Sacramento, California

Attention: Mr. Gordon Zander, Hydraulic Engineer

Dear Sir:

Herewith is submitted a report covering the water master service on Little Shasta River in Siskiyou County, California, during the season of 1929.

This report includes a description of the regulation and distribution of the waters of Little Shasta River and its tributaries in accordance with the provisions of the Stipulation and Agreement entered into by the various water users on March 27, 1927, and an agreement for water master service entered into on June 15, 1928, and a discussion of the results that were accomplished.

Run-off records and other pertinent data are included together with a financial statement showing the cost of water master service and the sources from which such cost was met.

Respectfully submitted,

A. W. Fuller
Water Master

REPORT ON WATER MASTER SERVICE

ON

LITTLE SHASTA RIVER AND TRIBUTARIES

SISKIYOU COUNTY, CALIFORNIA

DURING SEASON OF 1929.

INTRODUCTION

A brief history of the case involving the determination of the relative rights on Little Shasta River and its tributaries and subsequent stipulations and agreements will be found in the "Report on Water Master Service on Little Shasta River and Tributaries During Season of 1928" to which reference is made.

The water users were represented in their dealings with the Division of Water Resources during 1929 by a committee composed of E. C. Hart, J. C. Martin and D. C. Earhart.

At the close of the 1928 period of water master service it was proposed to commence the service for 1929 on April 1st; however, conditions were such that on March 13, 1929 the water users committee advised the Division that the service would not be required on April 1st. and requested that it commence on May 1, 1929.

The shortage in the total supply during the 1929 season eliminated entirely any consideration of the seventh priorities as set forth in the schedule of allotments and consideration of the second priorities was eliminated due to the fact that this portion of the schedule of allotments covered several springs which did not contribute to the

flow of Little Shasta River and several ditches which were not used during the 1929 season together with a small use in the mountains, near the head of the river, the regulation of which would have had no appreciable effect on the supply available to the main irrigated area of the stream system.

In view of the foregoing the balance of this report deals entirely with the distribution of the available supply from Cleland Springs, Dewey Gulch and from Little Shasta River at a point just above the intake to the Harp Ditch.

The foregoing also eliminated consideration of a portion of the first priorities.

DISTRIBUTION OF WATER

(1) Functions of Water Master

The functions of the water master included the distribution of the total available supply of water in accordance with the agreements previously refered to in this report and the collection of hydrographic and other pertinent data.

The water master service commenced on May 1, 1929 and during the first ten days thereof measuring devices were installed in all ditches for the purpose of providing accurate means of determining the quantities flowing in the ditches and assisting in a dependable method of regulating the distribution of the available supply of water. The measuring devices installed consisted of 1½ foot rectangular weirs with the exception that there was installed in the Terwilliger Main Cleland Ditch a 3 foot rectangular weir and in the Hart and Haight Ditch a 1 foot rectangular weir.

In order to determine the net available supply the following means were employed:

(1)-A guaging station was established on Little Shasta River just above the intake to the Harp Ditch at which point an automatic water stage recorder and a staff guage were installed and used in connection with an acoustic current meter to determine the flow in the stream.

When the flow in the stream had dropped to 6 second feet a 4 foot rectangular weir was installed and used in place of the current meter.

(2)-The flow from Cleland Springs was determined by means of the 3 foot weir in the Terwilliger Main Cleland Ditch used in conjunction with a 4 foot rectangular weir installed by Mr. Martin in

the Martin and Davis Ditch.

(3)-The flow in Dewey Gulch was determined by means of one foot rectangular weir installed therein.

Occasional return flow measurements were made at the intake to the Soule and Terwilliger Ditch which was just below the points where the only return flow was experienced. These measurements were made with a current meter and showed that the return flow so closely balanced channel losses in Little Shasta River that such losses were not considered in the distribution of the total available supply.

Throughout the period of water master service the probable percentage of allotments that could be delivered were calculated daily and the several ditches regulated in accordance therewith.

Records were kept of the water supply and distribution thereof from May 2nd. to September 30, 1929.

(2) Allotments Compared with Water Supply.

As explained in the introduction to this report a portion of the first and all of the second and seventh priorities were not considered in the allocation of the available supply of water during the 1929 season.

The priorities taken into consideration totaled 68.85 second feet and after the first nine days of water master service the sixth priorities were eliminated which left a total of 35.30 second feet with the available supply decreasing to 31% of this amount during the latter part of the season as illustrated in Plate II of this report.

(3) Efficiency of Distribution

A fair degree of efficiency in the distribution of the available supply in accordance with the terms of the stipulation and

agreement was experienced.

The fact that no permanent diversion structures have been installed at the heads of the ditches and that loose rocks are depended upon to divert the water operated to some extent against an accurate distribution.

The cooperation of the water users and their committee was of great assistance towards a fair distribution.

The only unfortunate insident which occured during the season was the daming of the Babcock, Martin and Soule Ditch on the night of May 20, 1929.

RUN-OFF RECORDS

AND

RETURN FLOW

The usual and customary methods of securing run-off records were employed. No attempt was made to obtain records of sources which did not contribute to the flow in Little Shasta River and the records are accordingly confined to Little Shasta River above the Harp Ditch, to Cleland Springs and to Dewey Gulch.

The results from the data collected are given in Tables 2, 3, 4 and 5 of this report and are graphically shown on Plate II of the report compared with the combined net discharge of the same sources during 1922.

It will be noted from Table 4 that the flow in Dewey Gulch ceased on June 21, 1929.

The only return flow experienced was from irrigation operations on the Terwilliger Estate. Measurements made of the flow in Little Shasta River below the points of return flow indicated that the returns balanced channel losses so closely that it was found unnecessary to consider either of these items in calculating the probable percentages of allotments that could be delivered.

The balancing of the return flow and channel losses during the 1929 season indicated slightly higher channel losses than during the 1928 season. This is probably explained by a lower flow in the stream and higher temperatures than in 1928.

PRECIPITATION

The precipitation at Mt. Shasta City and Montague for the seasonal year, October 1, 1928 to September 30, 1929, is compared with the average mean precipitation in Table 1 of this report and is graphically illustrated on Plate I.

As shown in this table and on the plate the total precipitation for the seasonal year 1928-29 was only 70.1% of the total average mean and no precipitation was experienced during the last three months of the seasonal year.

During the six months period from November 1st. to April 30th. the precipitation was 61.8% of the total average mean.

On Plate I the average mean is shown in black and the precipitation for the seasonal year of 1928-29 is shown in red and from this it will be noted that in December 1928 and June 1929 the precipitation was above normal, whereas during the balance of the seasonal year it was below normal.

USE OF WATER

Continuous records were kept of the distribution of the net available supply of water from May 1st. to September 30, 1929 and the results obtained are shown in Tables 7 to 14 inclusive of this report which show the daily discharge of each ditch involved.

All of the Terwilliger Estate ditches have been grouped in Table 7 due to the fact that the use of these ditches was rotated and the total daily allotment used through one ditch at a time. For this reason no separate record was kept of each ditch.

The acreage irrigated by each ditch during the first two months of the 1929 water master period has been estimated and shown in Table 6 of this report together with the quantity of water used thereon and the gross duty of water.

Table 6 has been confined to the first two months of the season owing to the fact that during the balance of the 1929 water master period irrigation for the most part was not practiced. The supply was so low during this period that in so far as most of the users were concerned water was available only for stockwatering and small pasture areas.

In those cases where the waters of a ditch are commingled with water from other sources the ditches have not been included in Table 6 as their inclusion would give erroneous results.

As will be noted from Table 6 only approximately 40% of the normally irrigated area was irrigated during 1929 and the gross use during the 1929 season, for the acreage irrigated, was about one cubic foot per second to 106 acres.

CROPS

A survey of the crops in the main portion of Little Shasta Valley was made which survey covered that portion of the valley served by the ditches named in Table 6 of this report.

The results of this survey showed that the average yield was approximately 60% of the normal yield and the crops irrigated and the estimated acreage thereof to be as follows:

Grain 350 acres, Alfalfa 255 acres, Hay 530 acres, Pasture 155 acres, Orchard 40 acres and miscellaneous 20 acres making a total of 1330 acres.

The grain acreage was considerably larger than that shown above, however, due to heavy late frosts the irrigation thereof was delayed with the result that sufficient water was not available to irrigate the entire area when such irrigation commenced.

The alfalfa fields throughout the valley showed a serious shortage of moisture during the latter part of the water master period and the water supply was not enough to promote sufficient growth for a second cutting during the period.

For a short time the irrigated pasture acreage was perhaps double that shown above and during the balance of the period only small scattered pastures were irrigated.

In that portion of Little Shasta Valley which is also served by the fairly constant flow from springs which do not contribute to the general supply much better results were obtained and the crop yield was approximately 80% of the normal.

DISCUSSION OF RESULTS FOR 1929

The results obtained under water master service during the 1929 season were very gratifying especially in view of the unusually low net available supply of water.

Although a serious shortage of water was experienced during the latter portion of the season practically no dissatisfaction was expressed in so far as the schedule of allotments, as set forth in the stipulation and agreement, was concerned and no interference on the part of the water users took place during that period.

FINANCIAL STATEMENT

The water master service during the 1929 season on Little Shasta River and its tributaries was financed partly by subscription from the water users and partly by contribution by the Division of Water Resources.

The total unit cost of the service per acre irrigated could not be determined, however, since the cost was apportioned on the percentage of the total of the priorities considered to which each water user was entitled the unit cost per acre foot deliveredm may be estimated.

Based on the above the unit cost for 1929 was 35 cents per acre foot as against 30 cents per acre foot for 1928 and one half of the cost in each case was paid by the Division of Water Resources. The increase in the cost for 1929 is explained by the fact that the net available supply of water was less than in 1928.

All subscriptions for the 1929 season have been paid with the exception of that of G. W. King for $7.15.

A financial statement in which receipts and disbursements are itemized, follows.

FINANCIAL STATEMENT

LITTLE SHASTA RIVER DISTRIBUTION

1929 SEASON

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RECEIPTS

Contributed by Water Users on Little Shasta River	$ 991.05	
Contributed by Division of Water Rights	1,000.00	$1,991.05

DISBURSEMENTS

Salaries and Wages	$ 941.78	
Automobile Expense	520.92	
Board and Lodging.	404.84	
Miscellaneous.	4.70	$1,872.24
Balance on hand March 10, 1930		$ 118.81

TABLE 1

CLIMATOLOGICAL DATA

Precipitation for Seasonal Year 1928-29 Compared
with Mean Precipitation Mount Shasta
City and Montague 1889-1929

Month	Average Mean Mt. Shasta and Montague 1889-1929	Precipitation for seasonal year 1928-1929			
		Mt. Shasta (Sisson)	Montague	Average Mt. Shasta and Montague	Per cent of Total Mean
October	1.33	1.15	0.58	0.87	3.8
November	4.85	5.75	2.08	3.91	17.2
December	2.65	5.60	2.03	3.82	16.8
January	2.26	1.20	0.47	0.84	3.7
February	3.87	3.30	1.31	2.30	10.1
March	2.28	3.10	0.24	1.67	7.3
April	2.74	2.20	0.83	1.52	6.7
May	0.97	0.15	0.27	0.21	0.9
June	0.46	1.55	0.18	0.82	3.6
July	0.18	0	0	0	0
August	0.20	0	0	0	0
September	0.98	0	0	0	0
Totals	22.77	24.00	7.99	15.96	70.1

~~TABLE 2~~

~~Continuous Records of~~ Daily Discharge in Cubic Feet per Second of

LITTLE SHASTA RIVER ABOVE HEAD OF HARP DITCH

~~Above Harp Ditch~~ ~~For~~ the Period ~~May~~ July ~~1st~~. to September 30, 1929.

Cut

Day	May	June	July	Aug.	Sept.	
1	28.	17.	5.6	3.4	2.7	
2	28.	16.	5.	3.1	2.7	
3	29.	16.	5.	3.1	2.7	
4	30.	16.	4.8	2.8	2.7	
5	31.	15.	4.6	2.8	2.7	
6	30.	15.	4.5	2.8	2.6	
7	29.	14.	4.4	2.8	2.5	
8	27.	14.	4.3	2.8	2.6	
9	26.	13.	4.2	2.8	2.7	
10	25.	13.	4.1	2.8	2.6	
11	24.	13.	4.2	2.8	2.6	
12	24.	12.	4.1	2.8	2.5	
13	23.	11.	4.0	2.7	2.6	
14	23.	11.	4.1	2.7	2.5	
15	22.	14.	4.0	2.7	2.5	
16	20.	12.	3.9	2.7	2.5	
17	20.	12.	3.9	2.7	2.4	
18	19.	9.7	3.7	2.7	2.5	
19	20.	9.5	3.7	2.7	2.5	
20	20.	9.4	3.7	2.7	2.7	
21	20.	9.1	3.7	2.7	2.7	
22	19.	9.0	3.7	2.6	2.8	
23	19.	8.9	3.5	2.7	2.9	
24	19.	8.9	3.6	2.8	2.9	
25	19.	8.0	3.6	2.7	2.9	
26	18.	7.	3.4	2.6	2.9	
27	17.	6.6	3.5	2.5	2.8	
28	17.	5.7	3.4	2.5	2.8	
29	17.	5.7	3.3	2.5	2.8	
30	16.	5.6	3.3	2.5	2.8	
31	16.	--	3.2	2.7	--	
Total Sec. Ft. Days	695.0	337.1	124.0	85.2	80.1	5 month period
Mean Sec. Ft.	22.4	11.2	4.0	2.8	2.7	8.7
Max. Sec. Ft.	31.0	17.0	5.6	3.4	2.9	31.0
Min. Sec. Ft.	16.0	5.6	3.2	2.5	2.4	2.4
Total Acre Ft.	1376.0	667.5	245.5	169.0	158.5	2616.5

Cut

Cut.

~~TABLE 3~~

~~Continuous Records of~~ Daily Discharge in Cubic Feet per Second of

OLELAND SPRINGS

For the Period ~~May~~ July 1st. to September 30, 1929.

Day	May	June	July	Aug.	Sept.	
1	8.3	8.3	7.9	8.4	8.7	
2	8.3	8.3	7.9	8.4	8.7	
3	8.3	8.3	7.9	8.4	8.7	
4	8.2	8.3	8.0	8.4	8.7	
5	8.2	8.3	8.0	8.4	8.7	
6	8.2	8.3	8.1	8.4	8.7	
7	8.2	8.2	8.1	8.4	8.7	
8	8.2	8.2	8.1	8.4	8.6	
9	8.2	8.1	8.1	8.4	8.6	
10	8.2	8.1	8.1	8.4	8.6	
11	8.2	8.0	8.2	8.4	8.6	
12	8.2	7.9	8.2	8.4	8.5	
13	8.2	7.9	8.3	8.4	8.5	
14	8.2	7.9	8.3	8.5	8.4	
15	8.2	7.9	8.4	8.5	8.4	
16	8.2	7.9	8.4	8.5	8.4	
17	8.2	7.9	8.4	8.6	8.3	
18	8.2	7.9	8.4	8.6	8.3	
19	8.2	7.9	8.4	8.6	8.3	
20	8.2	7.9	8.4	8.6	8.2	
21	8.2	7.9	8.4	8.6	8.2	
22	8.2	7.9	8.4	8.6	8.2	
23	8.2	7.9	8.5	8.6	8.2	
24	8.2	7.9	8.5	8.6	8.2	
25	8.2	7.9	8.5	8.7	8.2	
26	8.2	7.9	8.6	8.7	8.1	
27	8.2	7.9	8.4	8.7	8.1	
28	8.2	7.9	8.4	8.7	8.1	
29	8.2	7.9	8.4	8.7	8.1	
30	8.2	7.9	8.4	8.7	8.1	
31	8.3	--	8.4	8.7	--	
Total Sec. Ft. Days	254.6	240.5	256.5	264.4	252.1	5 month period
Mean Sec. Ft.	8.2	8.0	8.2	8.6	8.4	8.3
Max. Sec. Ft.	8.3	8.3	8.6	8.7	8.7	8.7
Min. Sec. Ft.	8.2	7.9	7.9	8.4	8.1	7.9
Total Acre Ft.	504.	476.	508.	524.	499.	2511.

TABLE 4

Continuous Records of Discharge

DEWEY GULCH

For the Period May 1st. to September 30, 1929.

Day	May	June	July	Aug.	Sept.	
1	0.30	0.1	No flow	No flow	No flow	
2	0.28	0.1				
3	0.27	0.1				
4	0.25	0.1				
5	0.21	0.1				
6	0.20	0.1				
7	0.19	0.1				
8	0.19	0.1				
9	0.18	0.1				
10	0.17	0.1				
11	0.17	0.1				
12	0.17	0.1				
13	0.17	0.1				
14	0.16	0.1				
15	0.16	0.1				
16	0.16	0.08				
17	0.16	0.06				
18	0.17	0.04				
19	0.17	0.02				
20	0.17	0.02				
21	0.17	0.01				
22	0.15	0.00				
23	0.13	0				
24	0.11	0				
25	0.1	0				
26	0.1	0				
27	0.1	0				
28	0.1	0				
29	0.1	0				
30	0.1	0				
31	0.1	--				
Total Sec. Ft. Days	5.16	1.73	0	0	0	5 Month period
Mean Sec. Ft.	0.17	0.06	0	0	0	0.05
Max. Sec. Ft.	0.30	0.10	0	0	0	0.30
Min. Sec. Ft.	0.10	0.00	0	0	0	0.00
Total Acre Ft.	10.22	3.43	0	0	0	13.7

TABLE 5

Combined Continuous Records of Discharge

LITTLE SHASTA RIVER, CLELAND SPRINGS and DEWEY GULCH

1929

Day	May	June	July	Aug.	Sept.	
1	37.	25.	14.	12.	12.	
2	37.	24.	13.	12.	12.	
3	38.	24.	13.	12.	11.	
4	39.	24.	13.	11.	11.	
5	40.	23.	13.	11.	11.	
6	39.	23.	13.	11.	11.	
7	38.	22.	13.	11.	11.	
8	36.	22.	12.	11.	11.	
9	35.	21.	12.	11.	11.	
10	33.	21.	12.	11.	11.	
11	32.	21.	12.	11.	11.	
12	32.	20.	12.	11.	11.	
13	31.	19.	12.	11.	11.	
14	31.	19.	12.	11.	11.	
15	30.	22.	12.	11.	11.	
16	29.	20.	12.	11.	11.	
17	28.	20.	12.	11.	11.	
18	27.	18.	12.	12.	11.	
19	28.	17.	12.	11.	11.	
20	28.	17.	12.	11.	11.	
21	28.	17.	12.	11.	11.	
22	28.	17.	12.	11.	11.	
23	27.	17.	12.	12.	11.	
24	27.	17.	12.	12.	11.	
25	27.	16.	12.	12.	11.	
26	26.	15.	12.	12.	11.	
27	26.	15.	12.	11.	11.	
28	25.	14.	12.	11.	11.	
29	25.	14.	12.	11.	11.	
30	24.	14.	12.	11.	11.	
31	24.	--	12.	12.	--	
Total Sec. Ft. Days	955.	579.	380.	350.	332.	5 Month period
Mean Sec. Ft.	31.	19.	12.5	11.	11.	17.
Max. Sec. Ft.	40.	25.	14.	12.	12.	40.
Min. Sec. Ft.	24.	14.	12.	11.	11.	11.
Total Acre Ft.	1891.	1146.	752.	693.	657.	5139.

TABLE 6

Use of Water in 1929 from Little Shasta River and Tributaries

Ranch	Acres Irrigated		Acres Irrigated per Ditch in 1929					Gross Diversion Acre Feet 1929	Acres Irrigated per Second Foot 1929
	Normal	1929	Terwilliger Estate	Dimmick	Soule and Terwilliger	Musgrave and Linton	Babcock, Martin and Soule		
Babcock - A. L.	157.5	18					18	76.	29
Dreyer - E. F.	98.1	32				32		46.	85
Earhart & Brown	19.6	7				7		10.	85
Fairchild & Grisez	85.5	* 0				0		0.	0
Haight - A. C.	27.4	10					10	13.	94
Haight - I. F.	27.3	12				12		13.	113
Hickman, Grisez & Miclo	202.5	* 0				0		0.	0
Kegg- W. D.	4.6	4		4				13.5	36
Long - J. F.	288.1	225				225		276.	99
Martin - W. T.	234.6	89					89	112.	97
O'Connor - E.	24.1	8				8		12.	81
O'Connor - M. J.	330.9	171				169	2	160.	129
Rohrer - J. B.	330.3	157				157		157.	121
Soule - Ann	220.0	85				56	29	105.	98
Soule - Charles	254.0	141			141			126.	133
Soule - C. W.	156.1	70					70	75.	112
Terwilliger Estate	219.0	179	179					204.	106
Terwilliger - E. D.	368.8	122			122			126.	117
Total	3048.4	1330	179	4	263	666	218	1524.5	106

* Proportionate share of water used by J. F. Long.

Note: Ditches whose water commingles with water from other sources not included in this tabulation. Only areas served between May 1st. and June 30, 1929 are listed.

TABLE 7

Continuous Records of Discharge

Terwilliger Estate Ditches

1929

Day	May	June	July	Aug.	Sept.	
1	1.9	1.7	1.4	1.4	1.4	
2	1.9	1.7	1.4	1.4	1.4	
3	2.0	1.7	1.4	1.4	1.4	
4	2.0	1.7	1.4	1.4	1.4	
5	2.1	1.6	1.4	1.4	1.4	
6	2.0	1.6	1.4	1.4	1.4	
7	2.0	1.6	1.4	1.4	1.4	
8	1.9	1.6	1.4	1.4	1.4	
9	1.9	1.6	1.4	1.4	1.4	
10	1.9	1.6	1.4	1.4	1.4	
11	1.9	1.6	1.4	1.4	1.4	
12	1.9	1.6	1.4	1.4	1.4	
13	1.8	1.5	1.4	1.4	1.4	
14	1.8	1.5	1.4	1.4	1.3	
15	1.8	1.6	1.4	1.4	1.3	
16	1.8	1.6	1.4	1.4	1.3	
17	1.8	1.6	1.4	1.4	1.3	
18	1.7	1.5	1.4	1.4	1.3	
19	1.8	1.5	1.4	1.4	1.3	
20	1.8	1.5	1.4	1.4	1.3	
21	1.8	1.5	1.4	1.4	1.3	
22	1.7	1.5	1.4	1.4	1.3	
23	1.7	1.5	1.4	1.4	1.2	
24	1.7	1.5	1.4	1.4	1.2	
25	1.7	1.5	1.4	1.4	1.2	
26	1.7	1.4	1.4	1.4	1.2	
27	1.7	1.4	1.4	1.4	1.2	
28	1.7	1.4	1.4	1.4	1.2	
29	1.7	1.4	1.4	1.4	1.2	
30	1.7	1.4	1.4	1.4	1.2	
31	1.7	--	1.4	1.4	--	
Total Sec Ft. Days:	56.5	46.4	43.4	43.4	38.5	5 Month Period
Mean Sec Ft.	1.8	1.6	1.4	1.4	1.3	1.5
Max. Sec. Ft.	2.0	1.7	1.4	1.4	1.4	2.0
Min. Sec. Ft.	1.7	1.4	1.4	1.4	1.2	1.2
Total Acre Ft.	112.	92.	86.	86.	76.	452.

TABLE 8

Continuous Records of Discharge

Martin and Davis Ditch

1929

Day	May	June	July	Aug.	Sept.	
1	6.	6.	5.2 6.0	4.	4.	
2	6.	6.	4.6	4.	4.	
3	6.	6.	4.6	4.	4.	
4	6.	6.	4.5	4.	4.	
5	6.	6.	4.3	4.	4.	
6	6.	6.	4.3	4.	4.	
7	6.	6.	4.2	4.	4.	
8	6.	6.	4.1	4.	4.	
9	6.	6.	4.	4.	4.	
10	6.	6.	4.	4.	4.	
11	6.	6.	4.1	4.	4.	
12	6.	6.	4.	4.	4.	
13	6.	6.	4.	4.	4.	
14	6.	6.	4.1	4.	4.	
15	6.	6.	4.1	4.	4.	
16	6.	6.	4.	4.	4.	
17	6.	6.	4.	4.	4.	
18	6.	6.	4.	4.	4.	
19	6.	6.	4.	4.	4.	
20	6.	6.	4.	4.	4.	
21	6.	6.	4.	4.	4.	
22	6.	6.	4.	4.	4.	
23	6.	6.	4.	4.	4.	
24	6.	6.	4.	4.	4.	
25	6.	6.	4.	4.	4.	
26	6.	6.	4.	4.	4.	
27	6.	6.	4.	4.	4.	
28	6.	5.3	4.	4.	4.	
29	6.	5.3	4.	4.	4.	
30	6.	5.2	4.	4.	4.	
31	6.	—	4. 4.8	4.	—	
Total Sec. Ft. Days	186.	177.8	128.1	124.	120.	5 Month Period
Mean Sec. Ft.	6.	5.9	4.1	4.	4.	4.8
Max. Sec. Ft.	6.	6.	5.2	4.	4.	6.
Min. Sec. Ft.	6.	5.2	4.	4.	4.	4.
Total Acre Ft.	368.	352.	254.	246.	238.	1458.

TABLE 9

Continuous Records of Discharge

DIMMICK DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	0.12	0.12	0.12	0.12	0.12	
2	0.12	0.12	0.10	0.12	0.12	
3	0.12	0.12	0.05	0.12	0.12	
4	0.12	0.12	0.05	0.12	0.12	
5	0.12	0.12	0	0.12	0.12	
6	0.12	0.12	0.12	0.1	0.12	
7	0.12	0.12	0.12	0.1	0.12	
8	0.12	0.12	0.12	0.1	0.12	
9	0.12	0.12	0.12	0.1	0.12	
10	0.12	0.12	0.12	0.1	0.12	
11	0.12	0.12	0.12	0.05	0.12	
12	0.12	0.12	0.12	0.05	0.12	
13	0.12	0.12	0.12	0.05	0.12	
14	0.12	0.12	0.12	0	0.12	
15	0.12	0.12	0.12	0	0.12	
16	0.12	0.12	0.12	0	0.12	
17	0.12	0.12	0.12	0	0.12	
18	0.12	0.12	0.12	0	0.1	
19	0.12	0.12	0.12	0	0.1	
20	0.12	0.12	0.12	0.12	0.1	
21	0.12	0.12	0.12	0.12	0.1	
22	0.12	0.10	0.10	0.12	0.1	
23	0.12	0.05	0.10	0.12	0.1	
24	0.12	0	0.05	0.12	0.1	
25	0.12	0.12	0.05	0.12	0.1	
26	0.12	0.10	0	0.12	0.1	
27	0.12	0.05	0.12	0.12	0.1	
28	0.12	0	0.12	0.12	0.1	
29	0.12	0	0.12	0.12	0.1	
30	0.12	0.12	0.12	0.12	0.1	
31	0.12	—	0.12		—	
Total Sec Ft. Days	3.72	3.06	3.14	2.69	3.34	5 Month Period
Mean Sec Ft.	0.12	0.10	0.10	0.09	0.11	0.10
Max. Sec Ft.	0.12	0.12	0.12	0.12	0.12	0.12
Min. Sec. Ft.	0.12	0	0	0	0.10	0
Total Acre Ft.	7.4	6.1	6.2	5.3	6.6	31.6

TABLE 10

Continuous Records of Discharge

SOULE and TERWILLIGER DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	3.4	2.1	0.75	0.70	0.65	
2	3.4	2.	0.75	0.66	0.65	
3	3.5	2.	0.75	0.66	0.65	
4	3.6	2.	0.75	0.62	0.65	
5	3.7	1.9	0.75	0.62	0.65	
6	3.6	1.9	0.75	0.62	0.64	
7	3.5	1.7	0.75	0.62	0.62	
8	3.3	1.7	0.75	0.62	0.62	
9	3.2	1.6	0.75	0.62	0.64	
10	3.1	1.6	0.75	0.62	0.62	
11	3.	1.6	0.75	0.62	0.62	
12	3.	1.5	0.75	0.62	0.60	
13	2.9	1.4	0.75	0.61	0.61	
14	2.8	1.4	0.75	0.62	0.6	
15	2.7	1.7	0.75	0.62	0.6	
16	2.5	1.5	0.75	0.62	0.6	
17	2.5	1.5	0.74	0.64	0.6	
18	2.3	1.2	0.73	0.64	0.6	
19	2.5	1.2	0.73	0.64	0.6	
20	2.5	1.2	0.73	0.64	0.6	
21	2.5	1.1	0.73	0.64	0.6	
22	2.3	1.1	0.73	0.62	0.6	
23	2.3	1.1	0.72	0.64	0.61	
24	2.3	1.1	0.73	0.65	0.61	
25	2.3	1.0	0.73	0.65	0.61	
26	2.2	0.83	0.73	0.64	0.6	
27	2.1	0.78	0.71	0.62	0.6	
28	2.1	0.75	0.7	0.62	0.6	
29	2.1	0.75	0.69	0.62	0.6	
30	2.	0.75	0.69	0.62	0.6	
31	2.	---	0.67	0.65	---	
Total Sec. Ft. Days	85.1	41.96	22.75	19.60	18.45	5 Month Period
Mean Sec. Ft.	2.7	1.37	0.73	0.63	0.62	1.21
Max. Sec. Ft.	3.7	2.1	0.75	0.70	0.65	3.7
Min. Sec. Ft.	2.0	0.75	0.67	0.62	0.60	0.6
Total Acre Ft.	168.5	83.	45.	39.	36.5	372.

TABLE 11

Continuous Records of Discharge

HART and HAIGHT DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	0.58	0.43	0.31	0.31	0.3	
2	0.58	0.42	0.31	0.31	0.3	
3	0.58	0.42	0.31	0.31	0.3	
4	0.60	0.42	0.31	0.3	0.3	
5	0.60	0.41	0.31	0.3	0.3	
6	0.59	0.41	0.31	0.3	0.3	
7	0.58	0.39	0.31	0.3	0.3	
8	0.56	0.39	0.31	0.3	0.3	
9	0.52	0.38	0.31	0.3	0.3	
10	0.51	0.38	0.31	0.3	0.3	
11	0.50	0.38	0.31	0.3	0.3	
12	0.50	0.37	0.31	0.3	0.3	
13	0.49	0.36	0.31	0.3	0.3	
14	0.49	0.36	0.31	0.3	0.3	
15	0.48	0.39	0.31	0.3	0.3	
16	0.46	0.38	0.31	0.3	0.3	
17	0.46	0.38	0.31	0.3	0.3	
18	0.45	0.35	0.31	0.3	0.3	
19	0.46	0.34	0.31	0.3	0.3	
20	0.46	0.34	0.31	0.3	0.3	
21	0.46	0.34	0.31	0.3	0.3	
22	0.45	0.34	0.31	0.3	0.3	
23	0.45	0.34	0.31	0.3	0.3	
24	0.45	0.34	0.31	0.3	0.3	
25	0.45	0.33	0.31	0.3	0.3	
26	0.44	0.32	0.31	0.3	0.3	
27	0.43	0.32	0.31	0.3	0.3	
28	0.43	0.31	0.31	0.3	0.3	
29	0.43	0.31	0.31	0.3	0.3	
30	0.42	0.31	0.31	0.3	0.3	
31	0.42	--	0.31	0.3	--	
Total Sec. Ft. Days	15.28	10.94	9.61	9.33	9.0	5 Month Period
Mean Sec. Ft.	0.49	0.36	0.31	0.3	0.3	0.35
Max. Sec. Ft.	0.60	0.43	0.31	0.31	0.3	0.6
Min. Sec. Ft.	0.42	0.31	0.31	0.3	0.3	0.3
Total Acre Ft.	30.	22.	19.	18.5	18.	107.5

TABLE 12

Continuous Records of Discharge

MUSGRAVE and LINTON DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	10.	6.4	2.5	2.4	2.2	
2	10.	5.9	2.5	2.3	2.2	
3	11.	5.9	2.5	2.3	2.2	
4	11.	5.9	2.5	2.2	2.2	
5	11.	5.7	2.5	2.2	2.2	
6	11.	5.7	2.5	2.2	2.2	
7	11.	5.3	2.5	2.2	2.2	
8	9.8	5.3	2.5	2.2	2.2	
9	9.5	4.9	2.5	2.2	2.2	
10	9.2	4.9	2.5	2.2	2.2	
11	8.8	4.9	2.5	2.2	2.2	
12	8.8	4.5	2.5	2.2	2.1	
13	8.5	4.2	2.5	2.1	2.1	
14	8.5	4.2	2.5	2.2	211	
15	8.1	5.2	2.5	2.2	2.1	
16	7.4	4.5	2.5	2.2	2.1	
17	7.4	4.5	2.5	2.2	2.1	
18	7.1	3.7	2.5	2.2	2.1	
19	7.4	3.6	2.5	2.2	2.1	
20	7.4	3.6	2.5	2.2	2.1	
21	7.4	3.5	2.5	2.2	2.1	
22	7.1	3.5	2.5	2.2	2.1	
23	7.	3.4	2.4	2.2	2.1	
24	7.	3.4	2.5	2.2	2.1	
25	7.	3.1	2.5	2.2	2.1	
26	6.7	2.8	2.4	2.2	2.1	
27	6.4	2.6	2.4	2.2	2.1	
28	6.4	2.5	2.4	2.2	2.1	
29	6.4	2.5	2.3	2.2	2.1	
30	6.	2.5	2.3	2.2	2.1	
31	6.	--	2.3	2.2	--	
Total Sec. Ft. Days	250.3	128.6	76.6	68.5	64.1	5 Month Period
Mean Sec. Ft.	8.1	4.3	2.5	2.2	2.1	3.8
Max. Sec. Ft.	11.	6.4	2.5	2.4	2.2	11.
Min. Sec. Ft.	6.	2.5	2.3	2.1	2.1	2.1
Total Acre Ft.	496.	255.	154.	136.	127.	1167.

TABLE 13

Continuous Records of Discharge

BABCOCK, MARTIN and SOULE DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	3.7	2.4	1.1	1.0	0.95	
2	3.7	2.3	1.1	0.96	0.95	
3	3.9	2.3	1.1	0.96	0.95	
4	3.9	2.3	1.1	0.92	0.95	
5	4.0	2.2	1.1	0.92	0.95	
6	3.9	2.2	1.1	0.92	0.94	
7	3.8	2.0	1.1	0.92	0.92	
8	3.6	2.0	1.1	0.92	0.92	
9	3.5	1.9	1.1	0.92	0.94	
10	3.4	1.9	1.1	0.92	0.92	
11	3.3	1.9	1.1	0.92	0.92	
12	3.3	1.7	1.1	0.92	0.90	
13	3.1	1.6	1.1	0.91	0.91	
14	3.1	1.6	1.1	0.92	0.9	
15	3.0	2.0	1.1	0.92	0.9	
16.	2.8	1.9	1.1	0.92	0.9	
17	2.8	1.9	1.1	0.94	0.9	
18	2.6	1.5	1.	0.94	0.9	
19	2.8	1.4	1.	0.94	0.9	
20	2.8	1.4	1.	0.94	0.9	
21	2.8	1.4	1.	0.94	0.9	
22	2.6	1.4	1.	0.92	0.9	
23	2.6	1.4	1.	0.94	0.91	
24	2.6	1.4	1.	0.95	0.91	
25	2.6	1.3	1.	0.95	0.91	
26	2.5	1.1	1.	0.94	0.9	
27	2.4	1.1	1.	0.92	0.9	
28	2.4	1.1	1.	0.92	0.9	
29	2.4	1.1	1.	0.92	0.9	
30	2.3	1.1	0.99	0.92	0.9	
31	2.3	--	0.97	0.95	--	
Total Sec Ft. Days	103.5	50.8	32.66	28.90	22.43	5 Month Period
Mean Sec. Ft.	3.3	1.7	1.1	0.93	0.91	1.6
Max. Sec. Ft.	4.0	2.4	1.1	1.0	0.95	4.0
Min. Sec. Ft.	2.3	1.1	0.97	0.91	0.9	0.9
Total Acre Ft.	205.	101.	65.	57.	54.	482.

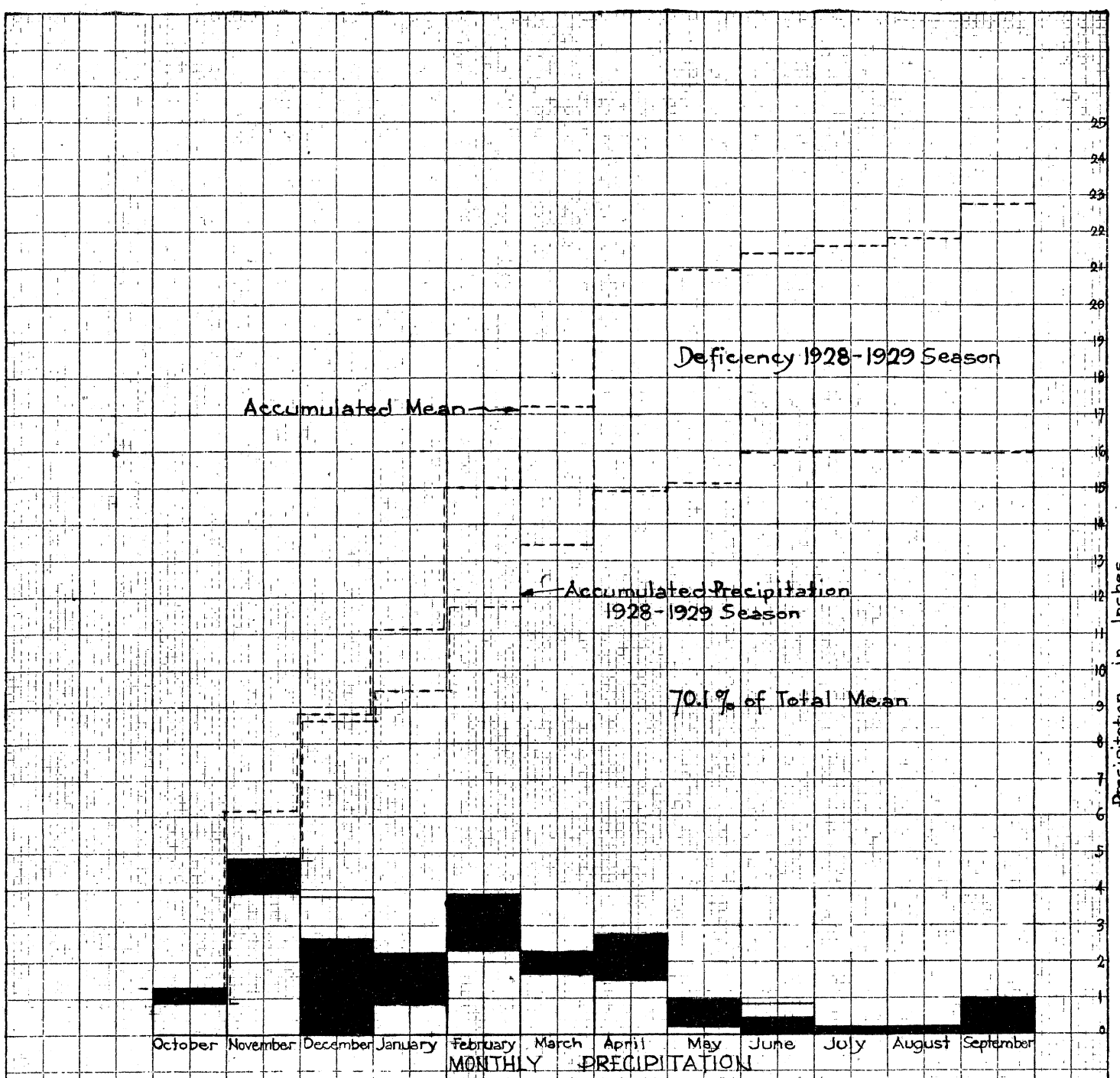
TABLE 14

Continuous Records of Discharge

HART, HAIGHT and PRATHER DITCH

1929

Day	May	June	July	Aug.	Sept.	
1	10.	6.3	2.1	1.9	1.8	
2	10.	5.9	2.1	1.8	1.8	
3	10.	5.9	2.1	1.8	1.8	
4	10.	5.9	2.1	1.7	1.8	
5	10.	5.5	2.1	1.7	1.8	
6	10.	5.5	2.1	1.7	1.7	
7	10.	5.1	2.1	1.7	1.7	
8	10.	5.1	2.1	1.7	1.7	
9	9.7	4.9	2.1	1.7	1.7	
10	9.3	4.9	2.1	1.7	1.7	
11	8.9	4.9	2.1	1.7	1.7	
12	8.9	4.2	2.1	1.7	1.6	
13	8.5	3.9	2.1	1.6	1.6	
14	8.5	3.9	2.1	1.7	1.6	
15	8.1	5.0	2.1	1.7	1.6	
16	7.4	4.2	2.1	1.7	1.6	
17	7.4	4.2	2.1	1.7	1.6	
18	7.0	3.3	2.	1.7	1.6	
19	7.4	3.3	2.	1.7	1.6	
20	7.4	3.2	2.	1.7	1.6	
21	7.4	3.1	2.	1.7	1.6	
22	7.	3.1	2.	1.7	1.6	
23	71	3.	2.	1.7	1.6	
24	7.	3.	2.	1.8	1.6	
25	7.	2.7	2.	1.8	1.6	
26	6.6	2.3	2.	1.7	1.6	
27	6.2	2.2	1.9	1.7	1.6	
28	6.2	2.1	1.9	1.7	1.6	
29	6.2	2.1	1.9	1.7	1.6	
30	5.9	2.1	1.9	1.7	1.6	
31	5.9	--	1.8	1.8	--	
Total Sec. Ft. Days	250.9	120.9	63.1	53.3	49.6	5 Month Period
Mean Sec. Ft.	8.1	4.0	2.0	1.7	1.7	3.5
Max. Sec. Ft.	10.	6.3	2.1	1.9	1.8	10.
Min. Sec. Ft.	5.9	2.1	1.8	1.6	1.6	1.6
Total Acre Ft.	497.	239.	125.	105.5	98.	1264.5

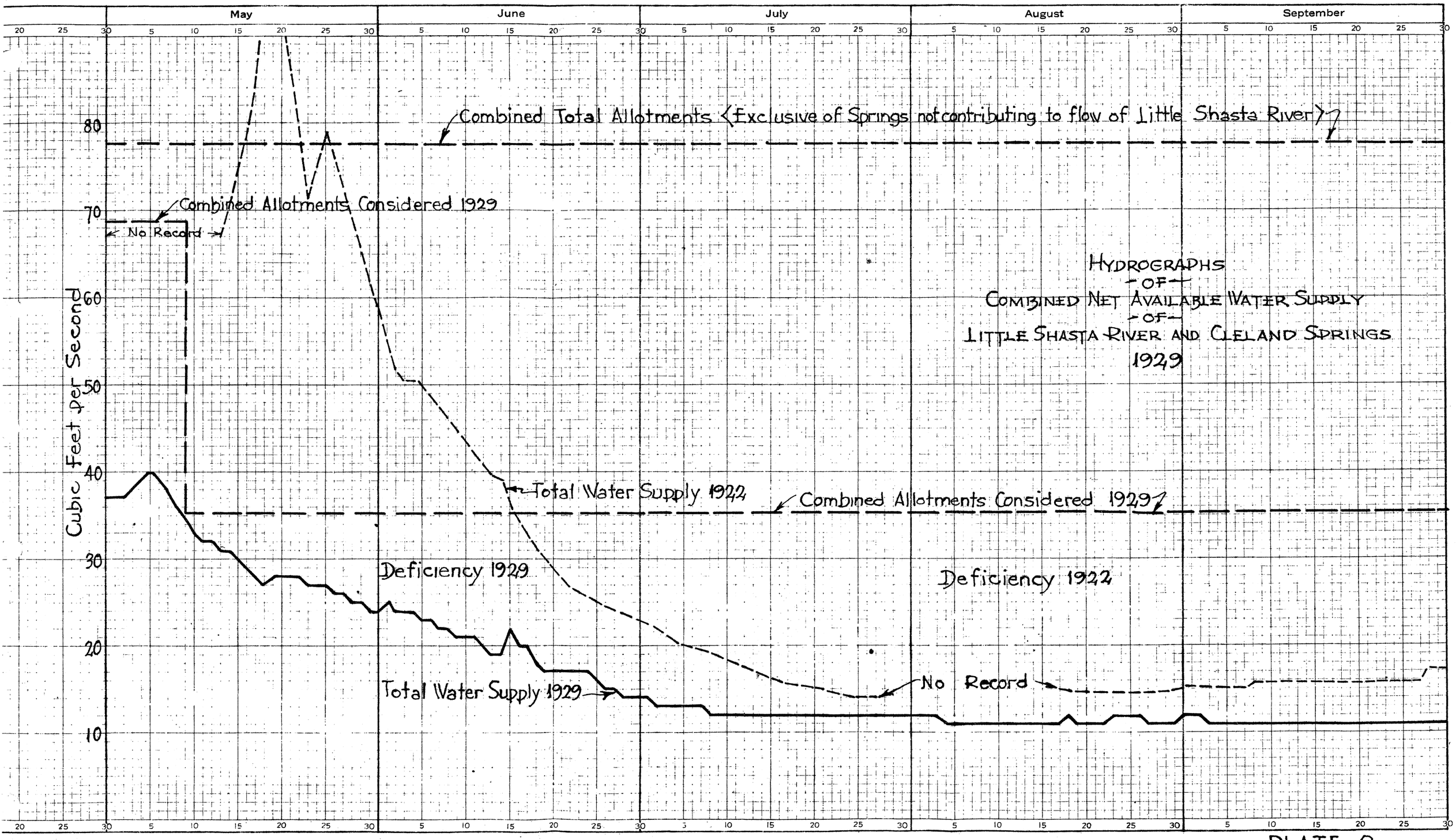


PRECIPITATION
FOR
SEASONAL YEAR 1928-1929
COMPARED WITH MEAN PRECIPITATION
MT. SHASTA CITY & MONTAGUE
1889-1929

Monthly average mean 1889 — 1929
Average — Mt. Shasta City and Montague 1928-1929

PLATE 1

CODEX BOOK CO., INC., NEW YORK, N. Y.
20 DIVISIONS PER INCH, NO. 318



HYDROGRAPHS
-OF-
COMBINED NET AVAILABLE WATER SUPPLY
-OF-
LITTLE SHASTA RIVER AND CLELAND SPRINGS
1929

PLATE 2