

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

REPORTS OF THE
DIVISION OF WATER RESOURCES
Edward Hyatt, State Engineer

REPORT ON
WATER MASTER SERVICE
ON
CEDAR CREEK
MODOC COUNTY, CALIFORNIA
DURING SEASON OF 1929

oOo

By L. C. Jopson, Water Master

oOo

Sacramento, California
March, 1930

TABLE OF CONTENTS

	Page
LETTER OF TRANSMITTAL - - - - -	1
INTRODUCTION - - - - -	2
History since report for previous season	
DISTRIBUTION OF WATER * - - - - -	4
1. Functions of Water Master - - - - -	4
2. Allotments compared with Water Supply - - - - -	5
3. Efficiency of Distribution - - - - -	6
RUN-OFF RECORDS - - - - -	7
PRECIPITATION - - - - -	8
USE OF WATER - - - - -	10
CROPS - - - - -	12
DISCUSSION OF RESULTS IN 1929 - - - - -	13
FINANCIAL STATEMENT - - - - -	15

TABLES:

1. Precipitation for Seasonal Year 1928-29 Compared with Mean Precipitation at Cedarville- 1894 to 1929.
2. Character of Precipitation at Cedarville for Seasonal Year 1928-29 Compared with Mean.
3. Continuous Records of Daily Discharge in Cubic Feet per Second of Cedar Creek above all Diversions for the Period from March 19th to June 30th, 1929.
4. Estimated Discharge in Cubic Feet per Second of Thoms Creek Ditch into Cedar Creek - 1929.
5. Estimated Daily Discharge in Cubic Feet per Second of McCulley Ditch on Cedar Creek at Head - 1929.
6. Estimated Daily Discharge in Cubic Feet per Second of Sizer Ditch on Cedar Creek at Head - 1929

TABLE OF CONTENTS (Continued)

TABLES (Continued)

7. Estimated Daily Discharge in Cubic Feet per Second of Fink Ditch on Cedar Creek at Head - 1929.
8. Estimated Daily Discharge in Cubic Feet per Second of Wallace Ditch on Cedar Creek at Head - 1929.
9. Estimated Daily Discharge in Cubic Feet per Second of Toney Ditch on Cedar Creek at Head - 1929.
10. Estimated Daily Discharge in Cubic Feet per Second of Street Ditch on Cedar Creek at Head - 1929.
11. Estimated Daily Discharge in Cubic Feet per Second of Acty Ditch on Cedar Creek - 1929.
12. Estimated Daily Discharge in Cubic Feet per Second of Beebe Ditch on Cedar Creek at Head - 1929.
13. Estimated Daily Discharge in Cubic Feet per Second of Lower Channel of Cedar Creek - 1929.
14. Estimated (Combined) Daily Discharge in Cubic Feet per Second of All Diversions from Cedar Creek - 1929+
15. Water Allotments on Cedar Creek Compared with Net Available Water Supply During 1929 Season.
16. Gross Use of Water for Acreage Irrigated from Cedar Creek During Season of 1929*

PLATES:

1. Hydrograph of Cedar Creek showing Water Supply Compared with Allotments in 1929.

STATE OF CALIFORNIA
Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

March 1, 1930

Mr. Edward Hyatt
State Engineer
Sacramento, California

Dear Sir: Attention: Mr. Gordon Zander, Hydraulic Engineer

A report covering the water master service on Cedar Creek, in Modoc County, California during the season of 1929, is submitted herewith.

This report includes a description of the regulation and distribution of the waters of Cedar Creek in accordance with the provisions of the decree entered, under date of February 15, 1923 by the Superior Court of the State of California, in and for the County of Modoc, in the case of W. E. Hill, et al., vs Herman Acty, et al.; and the decree entered under date of March 22, 1901, by the Superior Court of the State of California, in and for the County of Modoc, in the case of D. H. Lighty vs. John R. Cook, et al. A discussion of the results obtained is made and certain recommendations for greater efficiency of distribution are itemized for future use.

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

Respectfully submitted,


Water Master

REPORT ON WATER MASTER SERVICE
ON CEDAR CREEK, MODOC COUNTY, CALIFORNIA
DURING SEASON OF 1929

INTRODUCTION

The relative rights of the water users of Cedar Creek were established by a decree entered, under date of February 15, 1923, in the Superior Court of the State of California, in and for the County of Modoc, in the case of W. E. Hill, et al., vs. Herman Acty, et al., and the relative rights of the users of water diverted from Thoms Creek and conveyed by Cedar Creek were established by a decree entered, under date of March 22, 1901, in the Superior Court of the State of California, in and for the County of Modoc, in the case of D. H. Lighty, vs. John R. Cook, et al., copies of which decrees are on file in the office of the Division of Water Rights (now Division of Water Resources).

On September 27, 1928, an agreement was entered into by the Cedar Creek water users whereby the Division of Water Rights was empowered to appoint a water master to distribute the water of Cedar Creek during the 1929 irrigation season in accordance with the decrees above mentioned.

L. C. Jopson was appointed by the Division of Water Rights to act as water master for Modoc County during the 1929 irrigation season, but due to other duties he was unable to assume his work in the field until April 1st. Meanwhile Mr. T. R. Simpson of this office had taken charge of the water master service on March 19th and conducted it until April 1st on which date he was relieved by the writer.

The waters of Cedar Creek were administered in accordance

with the above mentioned decrees until July 1, 1929, when the water supply reached such a low stage that there was no necessity for further water master service.

DISTRIBUTION OF WATER

1. Functions of Water Master

The primary function of the water master on Cedar Creek was the supervision of the distribution of the waters of the stream in accordance with the following decrees of the Superior Court of the State of California in and for the County of Modoc, that dated February 15, 1923, in the case of W. E. Hill, et al., vs. Herman Acty, et al., establishing the rights of the various water users to the waters of Cedar Creek; and that dated May 22, 1901, in the case of D. H. Lighty, vs. John R. Cook, et al., establishing the rights of the water users to Thoms Creek water diverted from Thoms Creek and conveyed to Cedar Creek by the Thoms Creek Ditch. The water master also collected hydrographic and other data pertinent to the water master service. The authority of the water master to make the necessary supervision was provided in the agreement for water distribution during the 1929 season on Cedar Creek. Water master service was instituted in the field on March 19, 1929. Measuring devices were installed and repaired on all the diversion ditches immediately thereafter. These devices consisted of fully contracted rectangular and Cipolletti weirs of various crest lengths.

In order to obtain information as to the net water supply available for delivery, an automatic water stage recorder was installed on Cedar Creek immediately above the concrete weir built in the fall of 1926. This weir was built in accordance with a clause in the decree entered in the case of W. E. Hill, et al., vs. Herman Acty, et al. The weir is above all diversions and measures the

combined flows of Cedar Creek and Thoms Creek Ditch.

The flow of Cedar Creek often varies more than 50 per cent during a twenty-four hour period. The mean daily discharge for any current day could be computed from the recorded fluctuation in flow during the preceding twenty-four hour period. The computed mean daily discharge for the current day was the criterion for apportioning the flow, rather than the flow at any particular moment of observation.

The weir above which the automatic water stage recorded was installed was a standard five foot Cipolletti fully contracted weir with a sharp crest but was effected during periods of low flow by silting upstream from the crest which caused the velocity of approach to become an appreciable factor. During such times check measurements with an electric current meter were made to insure an accurate rating.

Distribution of the flow recorded at the register station was made to the various users as follows: The mean daily discharge at the station was determined as described above, from this was deducted the discharge of the Thoms Creek Ditch, ascertained by frequent trips to the summit of Cedar Pass through which the ditch spills into the Cedar Creek watershed, and finally the measured channel loss below the register station was deducted to give the net water supply available for diversion under the schedule of allotments on Cedar Creek.

The sole first right to divert water from Cedar Creek belongs to the McCulley Ditch so when the amount diverted thereby is deducted from the net available water supply, as determined above, the remainder of the water is subject to diversion by the second rights up to their scheduled allotments and then to the third rights up to their scheduled allotments. Water over and above the total scheduled allotments is divided

among the various rights in accordance with the size of their respective rights under the schedule. The Thoms Creek Ditch water was distributed according to the ratio provided in the court decree on that water to the users, who in 1929 had use therefor. This water was added to any water which was being diverted under a right on Cedar Creek.

Records were kept of the water supply and of the distribution of the same among the various diversions between March 19th and June 30th, 1929. Observations of crop conditions were made at intervals and the acreage irrigated in 1929 was estimated by the water master.

2. Allotments Compared with Water Supply

The average water supply on Cedar Creek in 1929 was but 40 per cent of the total allotments for the period from March 19th to June 30th. as shown in Table 15. The maximum average water supply for any seven day period was 67 per cent and for the final six day period the minimum was 10 per cent.

There were eight days during the season when some water was diverted by the third rights. Four days being the longest continuous diversion for them. The second rights diverted water continuously, as it was available, up to their full allotments from March 19th to May 24th. The first right diverted what water was needed up to five cubic feet per second until May 25th and thereafter the entire flow of Cedar Creek except for two days in June when a heavy rainstorm brought the creek up for a few days.

Thoms Creek Ditch is limited by court decree to a capacity of five cubic feet per second but rarely carries that much due to the condition of the conduit. The average flow during the season that it was open, in 1929 was about 1.7 cubic feet per second. With a maximum

flow of 4.0 cubic feet per second when that much water was available. The Thoms Creek Ditch diverted water in 1929 from April 25th to June 25th.

3. Efficiency of Distribution

A fair degree of efficiency of distribution, in accordance with the provisions of the agreement for administering the water during the 1929 season, was obtained. Weirs installed in the various ditches during previous seasons were repaired and reset so that an accurate check of the water could be made. The main factor to contend with in the operation of the weirs was silt which in a short time after cleaning the ditch filled it to such an extent that a daily cleaning was necessary. The flashy character of the run-off of Cedar Creek also was a factor effecting the efficiency of distribution.

During a large part of the 1929 irrigation season it was found to be advantageous for the users of second rights below the Cedarville - Lake City Highway to rotate their use of water in fourteen day periods. Under this schedule the Street and Beebe ditches received water for eight days and the Lower Channel users for five days. This arrangement gave the water users a larger irrigating head and thereby a more efficient distribution than would otherwise have been possible during a year of such sub-normal flow as 1929.

RUN-OFF RECORDS

The standard method of collecting run-off records was used in finding the discharge of Cedar Creek. The measuring station consisted of a staff gage and an automatic water stage recorder installed above a five foot Cipolletti weir. By applying the mean daily gage heights to the proper weir table a record of mean daily discharges was obtained as is tabulated in Table 3. Occasional current meter measurements were made at the station to determine the effect on the discharge of silting above the weir. As the flow dropped below ten cubic feet per second it was found that the weir table no longer applied and thereafter discharges were found by applying the mean daily gage heights to a rating curve established by current meter measurements.

The daily discharge of Thoms Creek Ditch was estimated from frequent observations made on a staff gage set at the entrance to the culvert under the highway at the summit of Cedar Pass. The station was rated by current meter measurements.

The hydrograph on Plate 1 of this report graphically shows the daily discharge of Cedar Creek as is tabulated in Table 3, compared with the combined allotments of water from Cedar Creek and Thoms Creek Ditch

PRECIPITATION

The precipitation at Cedarville, records of which are kept by the United States Weather Bureau for the seasonal year commencing September 1, 1928, and terminating on August 31, 1929, has been compared with the average mean precipitation in Table 1 of this report.

It will be noted from Table 1 that the total precipitation for the seasonal year 1928-29 was 80.0 per cent of the mean annual precipitation. It will be further noted that the precipitation did not occur uniformly through the year but was characterized by excessive fluctuation from month to month whereas it is the more regular occurrence of storms which causes the best run-off conditions.

Most of the season of snowfall on the Warner Range of mountains is normally included in the period from December first to April first. The most desirable snow pack, that is, snow which will usually pack hard and melt late in the spring occurs during this period. In average years, approximately 50 per cent of the total annual precipitation at Cedarville occurs during this four month period and 70 per cent of this is in the form of snow. During this four month period in 1928-29, the precipitation was about 65 per cent of the normal for the period, and but 54 per cent of this amount occurred in the form of snow. The deficiency of precipitation during these four months and especially the deficiency in snowfall largely accounts for the low run-off from Cedar Creek during April and May, 1929.

A further item of interest in Table 1 is the information contained in the "Note" which shows that the rainfall during the months,

May, June, July and August was nearly normal. The bulk of this rainfall occurred during two days in June greatly helping crops, which had previously received inadequate irrigation, and insuring a fair yield therefrom, when at least partial failure had been anticipated.

The distribution and character of the precipitation lead to the conclusion that the run-off of Cedar Creek during the general irrigation season in 1929, was probably farther below normal than the total seasonal precipitation would indicate.

USE OF WATER

Continuous records were kept of the disposition made of the flow of the flow of Cedar Creek during the period from March 19th to June 30th, 1929. The amount of water diverted by the various diversions was measured over weirs installed near the heads of the ditches. Frequent readings were made on these weirs with an occasional check measurement being made with a current meter. The daily diversions of the various ditches are tabulated in Tables 5 to 13, inclusive, submitted at the end of this report.

The areas irrigated under the various diversion systems, during the period of water master service in 1929, were estimated by the water master and have been tabulated in Table 16. The gross use of water under each diversion system, during the general irrigation season in 1929, has been calculated in acre feet per acre and in acres irrigated per cubic foot per second, and has been tabulated in Table 16 of this report. Table 16 also shows the dates of commencement and termination of general irrigation in 1929, for each diversion system.

It will be noted from Table 16 that the combined average rate of gross use during the 1929 season, for the acreage irrigated in 1929, was approximately one cubic foot per second to 63 acres.

A comparison of the use of water in 1929 with that in 1927, which year is thought to more nearly approach normal conditions of rainfall and run-off than any other year of record, follows:

Description	1929	1927	Use in 1929 Expressed in per cent of 1927
Average number of days in irrigation season	68	73	93
Total acre feet diverted	1948	2588	75
Acreage irrigated	910	1178	77
Use in acre feet per acre	2.14	2.2	97
Use in acres per cubic foot per second	63	66	95

As indicated by the above table there was 23 per cent less land irrigated in 1929 than in 1927 and 25 per cent less water in a 7 per cent shorter irrigation season. The use of water in 1929 was comparable with that in 1927.

CROPS

The crop yields on ranches irrigated from Cedar Creek in 1929, as estimated by the water master, were fair. The wild hay crop on the lower ranches was below normal as water was not available for irrigation after the middle of May. The crops on the higher ground consisting of alfalfa hay and seed, and grain were approximately normal on the lands which received irrigation water, on the lands which are ordinarily irrigated but received no water in 1929 the yield was poor.

DISCUSSION OF RESULTS IN 1929

The total water supply on Cedar Creek in 1929 was about 74 per cent of that in 1927, when conditions more nearly approached normal than in either 1926 or 1928.

Assuming that 1927 was practically normal and that the water supply in that year was adequate to irrigate all lands irrigated from Cedar Creek the following table has been prepared.

Period	Average Water Supply-c. f. s.		Flow in 1929 Expressed in per cent of flow in 1927
	1929	1927	
April 2 to April 15	7.7	16.3	48
April 16 to April 29	17.1	24.1	71
April 30 to May 13	16.1	22.2	72
May 14 to May 27	11.5	16.9	68
May 28 to June 10	5.6	12.2	46
June 11 to June 24	7.0	6.6	106
April 2 to June 24	10.8	16.4	66

The above table indicates that the average flow in 1929 was about 66 per cent of that in 1927 for the period shown, the deficiency is fairly well spread out during the entire season with the exception of the period from June 11th to June 24 when late rains brought the 1929 run-off above normal.

The average run-off was never great enough to give the third rights a full head of water nor to allow them to divert more than 4 days at one time, whereas in 1927 it is seen that the average water supply was sufficient through a considerable part of four weeks to allow some water to be diverted.

Considerable argument was encountered by the water master among the second and third rights as to whether the third rights were entitled to divert water at times when there was less than twenty cubic feet per second plus channel losses flowing in the creek or if in the case when some of the first or second rights were not using their full allotment of water the third rights could take water as soon as the other first and second rights had their allotments regardless of the total allotment of twenty second feet to those rights as a whole. It was held that as soon as the first and second rights had as much water as they desired up to their full allotments the third rights could begin to divert regardless of the twenty cubic feet per second clause in the court decree. Provided that such excess over the desired or allotted water to the first and second rights is not taken in such a way as to injure any of the first and second rights in diverting any amount up to their allotments.

FINANCIAL STATEMENT

The investigation and water master service during the 1929 season in Modoc County on Davis, Soldier, Cedar, Owl and Emerson Creeks were financed partly by subscription from the water users and partly by contribution by the Division of Water Resources.

No segregation was made in the expense of conducting the work on these five stream systems in 1929. The total unit cost of the work on these five stream systems was twenty-five cents per acre of irrigated land, of which one-half was borne by the State. The unit cost to the water users was thus about twelve and one-half cents per acre of irrigated land.

A financial statement in which receipts and disbursements are itemized follows:

TABLES

TABLE 1

Precipitation for Seasonal Year 1928-29 Compared with
Mean Precipitation at Cedarville - 1894 to 1929

Month	Mean Precipitation: at Cedarville	Precipitation for Seasonal Year 1928-29	
		Cedarville	Per cent of Total Mean
September	0.26	0.40	3.1
October	1.03	0.15	1.2
November	1.59	1.43	11.0
December	1.53	0.42	3.2
January	1.81	2.08	16.0
February	1.64	0.59	4.5
March	1.49	1.20	9.3
April	0.89	1.85	14.2
May	1.12	0.29	2.2
June	0.68	1.98	15.2
July	0.28	0.00	0.0
August	0.21	0.00	0.0
TOTAL	12.99	10.39	80.0

Note: Per cent of Total Mean from May 1st to August 31st
of average year is 17.6%, whereas in 1929 it was 17.4%

TABLE 2

Character of Precipitation at Cedarville for
Seasonal Year 1928-29 compared with Mean

Month	Mean Precipitation				Precipitation 1928-29			
	Total Inches	Snow Inches	Rain Inches	Snow Ex- pressed in per cent of total	Total Inches	Snow Inches	Rain Inches	Snow Ex- pressed in per cent of total
December	1.53	1.10	0.43	72	0.42	0.20	0.22	48
January	1.81	1.40	0.41	77	2.08	1.50	0.58	72
February	1.64	1.00	0.64	61	0.59	0.40	0.19	68
March	1.49	1.10	0.39	74	1.20	0.20	1.00	17
TOTAL	6.53	4.60	1.93	70	4.29	2.30	1.99	54

Note: 10 inches of snow assumed equal to 1 inch of rain.

TABLE 3

CONTINUOUS RECORDS OF DAILY DISCHARGE IN CUBIC FEET PER SECOND OF CEDAR CREEK ABOVE ALL DIVERSIONS FOR THE PERIOD FROM MARCH 19TH TO JUNE 30TH, 1929

Day	March	April	May	June	
1		9.4	17.5	5.6	
2		9.4	16.7	5.5	
3		9.4	16.4	5.3	
4		7.9	15.9	5.3	
5		8.0	18.2	5.1	
6		7.2	16.1	5.2	
7		6.8	16.0	5.4	
8		6.6	15.9	5.3	
9		6.6	15.4	5.9	
10		6.2	15.1	5.9	
11		6.2	15.1	5.7	
12		6.5	14.1	5.5	
13		6.7	14.1	5.2	
14		6.3	14.6	4.8	
15		13.8	14.5	21.	
16		24.	14.4	17.0	
17		22.	14.1	8.4	
18		15.7	13.8	5.8	
19	27.	13.5	13.6	5.3	
20	19.3	13.3	12.7	4.9	
21	15.7	14.1	11.8	4.3	
22	12.5	15.4	10.8	3.5	
23	11.7	14.6	9.8	3.2	
24	9.7	15.5	8.9	3.0	
25	9.7	16.3	7.9	2.9	
26	9.5	16.9	7.4	2.6	
27	10.5	17.4	6.8	2.5	
28	10.3	17.5	6.1	2.5	
29	9.4	24.	6.1	2.4	
30	9.4	18.3	5.9	2.4	
31	9.4	--	5.7	--	
Total Sec:				104 Day	
Ft. Days	*173.8	375.5	391.4	167.4	Period
Mean					
Sec. Ft.:	*13.37	12.50	12.63	5.58	10.65
Maximum					
Sec. Ft.:	*27.	24.	18.2	21.	27.
Minimum					
Sec. Ft.:	*9.4	6.2	5.7	2.4	2.4
Total					
Ac. Ft.:	*344.6	744.6	776.1	332.0	2197.3

* 13 day period

TABLE 4

ESTIMATED DISCHARGE IN CUBIC FEET PER
SECOND OF THOMS CREEK DITCH INTO CEDAR
CREEK - 1929

Day	April	May	June
1		1.8	0.9
2		1.8	0.8
3		0.5	0.7
4		0.0	0.7
5		2.2	0.6
6		2.9	0.6
7		3.0	1.0
8	NO DIVERSION	3.0	1.0
9		3.0	0.9
10		3.0	0.9
11		3.0	0.9
12		3.0	0.9
13		3.0	0.8
14		4.0	0.8
15		4.0	1.0
16		4.0	1.0
17		4.0	0.9
18		4.0	0.8
19		4.0	0.7
20		3.8	0.7
21		3.6	0.6
22		3.3	0.5
23		3.0	0.4
24	0.0	2.8	0.3
25	0.9	2.4	0.2
26	0.5	2.0	0.0
27	0.5	1.6	
28	0.5	1.1	
29	1.4	1.1	NO DIVERSION
30	1.4	1.0	
31	--	0.9	
Total Sec.			62 Day
Ft. Days	* 5.2	80.8	** 18.6
Mean			
Sec. Ft.	* 0.87	2.61	** 0.74
Maximum			
Sec. Ft.	* 1.4	4.0	** 1.0
Minimum			
Sec. Ft.	* 0.5	0.0	** 0.2
Total			
Ac. Ft.	* 10.3	160.2	** 36.9

* 6 day period
** 25 day period

TABLE 5

ESTIMATED DAILY DISCHARGE IN CUBIC FEET
PER SECOND OF McCULLY DITCH ON CEDAR
CREEK AT HEAD - 1929

Day	March	April	May	June	
1		0.6	4.0	4.5	
2		0.6	4.0	4.5	
3		0.6	4.0	4.4	
4		0.6	4.0	4.4	
5		0.6	4.0	4.3	
6		0.6	4.0	4.2	
7		0.6	4.0	4.2	
8		0.6	4.0	4.1	
9		0.6	4.0	4.8	
10		0.6	4.0	4.8	
11		0.6	4.0	4.6	
12		0.6	4.0	4.4	
13		0.8	4.0	4.2	
14		0.8	4.0	3.9	
15		2.0	4.0	5.0	
16		2.8	4.0	4.5	
17		2.8	4.0	4.8	
18		2.6	3.9	4.6	
19	0.6	2.5	3.7	4.4	
20	0.6	2.3	3.5	4.0	
21	0.6	2.3	3.2	3.6	
22	0.6	2.3	3.8	2.9	
23	0.6	2.3	3.5	2.7	
24	0.6	2.3	3.3	2.6	
25	0.6	2.6	5.0	2.6	
26	0.6	3.6	5.0	2.5	
27	0.6	3.6	5.0	2.4	
28	0.6	4.0	4.8	2.4	
29	0.6	4.0	4.8	2.3	
30	0.6	4.0	4.7	2.3	
31	0.6	--	4.6	--	
Total Sec:				104 Day	
Ft. Days	*7.8	54.8	126.8	114.9	Period
Mean					
Sec. Ft.	*0.6	1.83	4.09	3.83	2.93
Maximum					
Sec. Ft.	*0.6	4.0	5.0	5.0	5.0
Minimum					
Sec. Ft.	*0.6	0.6	3.2	2.3	0.6
Total					
Ac. Ft.	*15.5	108.7	251.4	227.8	603.4

* 13 day period

TABLE 6

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER SECOND OF SIZER DITCH ON CEDAR CREEK AT HEAD - 1929

Day	March	April	May	June	
1			1.3	0.4	
2			0.0	0.4	
3			0.0	0.4	
4		NO DIVERSION	0.0	0.3	
5			0.0	0.3	
6			1.0	0.3	
7			1.0	0.4	
8			1.0	0.4	
9			1.0	0.4	
10			1.0	0.0	
11			1.0		
12	NO DIVERSION		1.0		
13			1.0		
14			1.0		
15			1.4		
16		0.0	1.4		
17	NO DIVERSION	1.0	1.4		
18		1.0	1.4		
19		0.9	1.3		
20		0.9	1.2	NO DIVERSION	
21		0.9	1.1		
22		0.9	1.1		
23		1.0	1.0		
24		1.0	0.9		
25		0.9	0.8		
26		1.2	0.7		
27		1.2	0.5		
28		1.2	0.4		
29		1.3	0.4		
30		1.3	0.4		
31		--	0.4		
Total Sec.:				54 Day	
Ft. Days		*14.7	26.1	**3.3	Period
Mean					
Sec. Ft.		*1.05	0.84	**0.37	0.82
Maximum					
Sec. Ft.		*1.3	1.4	**0.4	1.4
Minimum					
Sec. Ft.		*0.9	0.0	**0.3	0.0
Total					
Ac. Ft.		*29.2	51.8	**6.5	87.5

* 14 day period
 ** 9 day period

TABLE 7

ESTIMATED DAILY DISCHARGE IN CUBIC
FEET PER SECOND OF FINK DITCH ON
CEDAR CREEK AT HEAD - 1929

Day	March	April	May	June
1			0.6	0.2
2			0.0	0.15
3			0.0	0.05
4			0.6	0.05
5			0.9	0.1
6			1.4	0.0
7			1.4	0.3
8			1.4	0.3
9			1.4	0.1
10			1.4	0.5
11			1.4	0.6
12			1.4	0.6
13			1.4	0.55
14			1.5	0.55
15		0.0	1.5	1.0
16		0.9	1.5	1.0
17		0.9	1.5	0.8
18		0.9	1.5	0.7
19		0.0	1.4	0.6
20		0.0	1.3	0.5
21		0.0	1.2	0.4
22		0.0	1.1	0.3
23		0.0	1.0	0.25
24		0.0	0.9	0.2
25		0.0	0.9	0.1
26		0.2	0.7	0.0
27		0.2	0.6	
28		0.2	0.3	
29		0.75	0.3	
30		0.75	0.3	
31		--	0.2	
Total Sec.:				71 Day
Ft. Days		*4.8	31.0	**9.9
Mean				0.64
Sec. Ft.		*0.32	1.00	**1.00
Maximum				1.5
Sec. Ft.		*0.9	1.5	**1.0
Minimum				0.0
Sec. Ft.		*0.0	0.0	**0.0
Total				90.6
Ac. Ft.		*9.5	61.5	**19.6

* 15 day period

** 25 day period

TABLE 8

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF WALLACE DITCH ON CEDAR CREEK AT
HEAD - 1929

Day	March	April	May	June
1		1.0	1.7	0.3
2		1.0	0.0	0.25
3		1.0	1.6	0.25
4		1.0	1.0	0.25
5		0.8	2.2	0.2
6		0.8	1.7	0.3
7		0.0	1.7	0.3
8		0.0	1.7	0.3
9		0.0	1.65	0.4
10		0.0	1.65	0.4
11	NO RECORD	0.0	1.65	0.3
12	NO RECORD	1.1	1.65	0.3
13	NO RECORD	1.1	1.65	0.25
14	NO RECORD	0.4	1.9	0.25
15		1.0	1.9	1.2
16		1.1	1.9	1.1
17		1.1	1.9	1.0
18		1.1	1.9	0.5
19	1.0	1.05	1.9	0.3
20	1.0	1.0	1.7	0.25
21	0.8	1.0	1.6	0.2
22	0.6	1.1	1.5	0.2
23	0.6	1.0	1.4	0.15
24	0.6	1.0	1.2	0.1
25	0.6	1.0	1.1	0.1
26	0.6	1.0	0.6	0.0
27	0.6	1.1	0.5	NO
28	1.0	1.1	0.4	DIVER-
29	1.0	1.1	0.4	SION
30	1.0	1.65	0.3	
31	1.0	--	0.3	
:Total Sec: : : : : 99 Day :				
:Ft. Days : *10.4 : 25.6 : 42.25 : **9.15 : Period :				
: Mean : : : : : :				
: Sec. Ft.: *0.80 : 0.85 : 1.36 : **0.37 : 0.88 :				
: Maximum : : : : : :				
: Sec. Ft.: *1.0 : 1.65 : 2.2 : **1.2 : 2.2 :				
: Minimum : : : : : :				
: Sec. Ft.: *0.6 : 0.0 : 0.0 : **0.1 : 0.0 :				
: Total : : : : : :				
: Ac. Ft. : *20.6 : 50.8 : 83.8 : **18.1 : 173.3 :				

* 13 day period
** 25 day period

TABLE 9

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF TONEY DITCH ON CEDAR CREEK AT
HEAD - 1929

Day	April	May	June
1		1.0	
2		1.0	
3		1.0	
4	NO DIVERSION	1.0	
5		0.75	
6		0.75	
7		0.75	
8		0.8	
9		0.8	
10		0.5	
11	0.0	0.5	
12	0.5	0.5	
13	0.5	0.5	NO DIVERSION
14	0.4	0.35	
15	1.0	0.35	
16	1.0	0.35	
17	1.1	0.35	
18	0.85	0.3	
19	0.8	0.3	
20	0.8	0.3	
21	0.8	0.3	
22	0.9	0.2	
23	0.9	0.2	
24	1.3	0.2	
25	0.9	0.2	
26	1.2	0.0	
27	1.2		
28	0.9		
29	1.0	NO	
30	1.0	DIVER-	
31	-	SION	
Total Sec.:			44 Day
Ft. Days	*17.05	**13.25	Period
Mean			
Sec. Ft.	* 0.90	** 0.53	0.69
Maximum			
Sec. Ft.	* 1.2	** 1.0	1.2
Minimum			
Sec. Ft.	* 0.4	** 0.2	0.2
Total			
Ac. Ft.	*33.8	**26.3	60.1

* 19 day period
** 25 day period

TABLE 10

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF STREET DITCH ON CEDAR CREEK AT
HEAD - 1929

Day	March	April	May	June
1		2.0	0.0	
2		2.0	0.0	
3		2.0	0.0	
4		2.0	0.0	
5		2.0	5.5	
6		2.0	4.75	
7		2.0	3.8	
8		1.8	4.0	
9		1.8	4.2	
10		1.5	3.5	
11		1.4	4.0	
12		1.3	3.0	
13		1.3	1.2	
14		1.1	0.0	0.0
15		2.75	0.0	3.0
16		4.5	0.0	2.8
17		4.0	0.0	0.0
18		2.8	0.0	
19	4.0	2.8	2.2	
20	3.0	2.8	2.2	
21	2.0	4.8	2.0	
22	1.0	5.0	1.1	
23	2.2	5.0	1.0	
24	2.2	5.4	0.9	
25	2.2	5.5	0.0	
26	2.0	5.5		
27	2.0	5.8		
28	2.4	5.8	NO	
29	2.0	2.9	DIVER-	
30	2.0	0.0	SION	
31	2.0	--		
Total Sec.				67 Day
Ft. Days	*29.0	89.55	**43.35.	Period
Mean				
Sec. Ft.	* 2.23	2.98	** 1.81	2.42
Maximum				
Sec. Ft.	* 4.0	5.8	** 5.5	5.8
Minimum				
Sec. Ft.	* 1.0	0.0	** 0.0	0.0
Total				
Ac. Ft.	*57.5	177.6	**86.0	321.1

* 13 day period
** 24 day period

TABLE 11

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF ACTY DITCH ON CEDAR CREEK - 1929

Day	March	April	May
1			
2			
3			
4			
5			
6			
7		NO DIVERSION	
8			
9	NO RECORD		
10		NO DIVERSION	
11			
12		NO DIVERSION	
13			
14			
15		0.0	
16		2.5	
17		2.0	
18		1.0	NO DIVERSION
19	3.0	0.0	
20	2.5		
21	2.0	NO DIVERSION	
22	1.0		
23	0.0		
24		NO DIVERSION	
25			
26	NO	NO	
27	DIVER*		
28	SION	0.0	
29		1.8	
30		0.0	
31		--	
Total Sec:	*8.5	*7.3	42 Day
Ft. Days			Period
Mean			
Sec. Ft.	*2.12	*1.83	0.38
Maximum	*3.0	*2.5	3.0
Sec. Ft.			
Minimum			
Sec. Ft.	*0.0	*0.0	0.0
Total			
Ac. Ft.	*16.9	*14.5	31.4

* 4 day period

TABLE 12

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF BEEBE DITCH ON CEDAR CREEK AT
HEAD - 1929

Day	March	April	May	June
1		1.0	0.0	
2		1.0	0.0	
3		1.0	0.0	
4		1.0	0.0	
5		0.8	3.3	
6		0.0	1.5	
7		0.0	2.2	
8		0.0	1.9	
9		0.0	1.3	
10		0.0	2.0	
11		1.1	1.5	
12		1.1	2.5	
13		1.1	0.8	
14		0.9	0.0	
15		1.8	0.0	0.8
16		2.6	0.0	0.6
17		2.5	0.0	
18		1.3	0.0	
19	2.0	1.3	1.3	
20	1.0	1.3	1.3	
21	1.0	3.0	1.2	
22	1.0	3.5	0.7	
23	1.0	3.2	0.6	
24	1.0	3.3	0.5	
25	1.0	3.3	0.0	
26	1.0	3.3		
27	1.0	3.4		
28	1.0	3.4	NO DIVER-	
29	1.0	1.7	SION	
30	1.0	0.0		
31	1.0	--		
Total Sec.				67 Day
Ft. Days	*14.0	47.9	**22.6	Period
Mean				
Sec. Ft.	* 1.08	1.60	** 0.94	1.26
Maximum				
Sec. Ft.	* 2.0	3.5	** 3.3	3.5
Minimum				
Sec. Ft.	* 1.0	0.0	** 0.0	0.0
Total				
Ac. Ft.	*27.8	95.0	**44.8	167.6

* 13 day period
** 24 day period

TABLE 13

ESTIMATED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF LOWER CHANNEL OF CEDAR CREEK - 1929

Day	March	April	May	June
1		3.5	8.7	
2		3.5	8.7	
3		3.5	8.7	
4		3.0	8.7	
5		2.5	0.0	
6		2.5	0.0	
7		3.0	0.0	
8		3.0	0.0	
9		3.0	0.0	NO FLOW
10	NO RECORD	3.0	0.0	NO FLOW
11	NO RECORD	2.0	0.0	NO FLOW
12	NO RECORD	0.8	0.0	NO FLOW
13	NO RECORD	0.8	2.0	
14	NO RECORD	1.6	4.5	
15		4.0	4.4	6.0
16		6.0	4.3	4.0
17		5.0	4.0	
18		3.0	4.0	
19	15.0	3.0	0.0	
20	10.0	3.0		
21	8.0	0.0		
22	6.0	0.0		
23	6.0	0.0		
24	4.0	0.0		
25	4.0	0.0		
26	4.0	0.0	NO FLOW	NO FLOW
27	5.0	0.0	NO FLOW	NO FLOW
28	4.0	0.0	NO FLOW	NO FLOW
29	3.5	4.6	NO FLOW	NO FLOW
30	3.5	9.5		
31	3.5	- -		
Total Sec.				61 Day
Ft. Days	*76.5	73.8	**58.0	Period
Mean				
Sec. Ft.	* 5.89	2.46	** 3.22	3.42
Maximum				
Sec. Ft.	*15.0	9.5	** 8.7	15.0
Minimum				
Sec. Ft.	* 3.5	0.0	** 0.0	0.0
Total				
Ac. Ft.	*151.7	146.3	**115.0	413.0

* 13 day period

** 18 day period

TABLE 14

ESTIMATED COMBINED DAILY DISCHARGE IN CUBIC FEET PER
SECOND OF ALL DIVERSIONS FROM CEDAR CREEK - 1929+

Day	March	April	May	June	
1		8.1	17.3	5.4	
2		8.1	13.7	5.3	
3		8.1	15.3	5.1	
4		7.6	15.3	5.0	
5		6.7	16.65	4.9	
6		5.9	15.1	4.8	
7		5.6	14.85	5.2	
8		5.4	14.8	5.1	
9		5.4	14.35	5.7	
10		5.1	14.05	5.7	
11		5.1	14.05	5.5	
12		5.4	14.05	5.3	
13		5.6	12.55	5.0	
14		5.2	13.25	4.7	
15		12.55	13.55	17.0	
16		21.4	13.45	14.0	
17		20.4	13.15	6.6	
18		14.55	13.0	5.8	
19	25.6	12.35	12.1	5.3	
20	18.1	12.1	11.5	4.75	
21	14.4	12.8	10.55	4.2	
22	10.2	13.7	9.55	3.4	
23	10.4	13.4	8.7	3.1	
24	8.4	14.3	7.9	2.9	
25	8.4	14.2	7.8	2.8	
26	8.2	16.0	7.0	2.5	
27	9.2	16.5	6.6	2.4	
28	9.0	16.6	5.9	2.4	
29	8.1	19.15	5.9	2.3	
30	8.1	18.2	5.7	2.3	
31	8.1	--	5.5	--	
Total Sec.					104 Day
Ft. Days	*116.2	335.5	363.15	154.45	Period
Mean					
Sec. Ft.	* 8.94	11.18	11.71	5.15	9.61
Maximum					
Sec. Ft.	* 25.6	21.4	17.3	17.0	25.6
Minimum					
Sec. Ft.	* 8.1	5.1	5.5	2.3	2.3
Total					
Ac. Ft.	*289.9	665.3	720.1	306.3	1981.6

+ Includes Toms Creek water.

* 13 day period

TABLE 15

WATER ALLOTMENTS ON CEDAR CREEK COMPARED WITH NET
AVAILABLE WATER SUPPLY DURING 1929 SEASON

Period	Average Water Available Cubic Ft. Per Sec.	Per Cent of Allotment. *
3/19 to 3/25	13.5	56
3/26 to 4/1	8.4	35
4/2 to 4/8	6.77	28
4/9 to 4/15	6.34	26
4/16 to 4/22	15.33	64
4/23 to 4/29	15.74	66
4/30 to 5/6	15.94	67
5/7 to 5/13	14.1	59
5/14 to 5/20	12.9	54
5/21 to 5/27	8.7	36
5/28 to 6/3	5.4	23
6/4 to 6/10	5.2	22
6/11 to 6/17	8.3	35
6/18 to 6/24	4.21	18
6/25 to 6/30	2.45	10
Mean	9.61	40

* Cedar Creek allotment = 23.90 cubic feet per second.

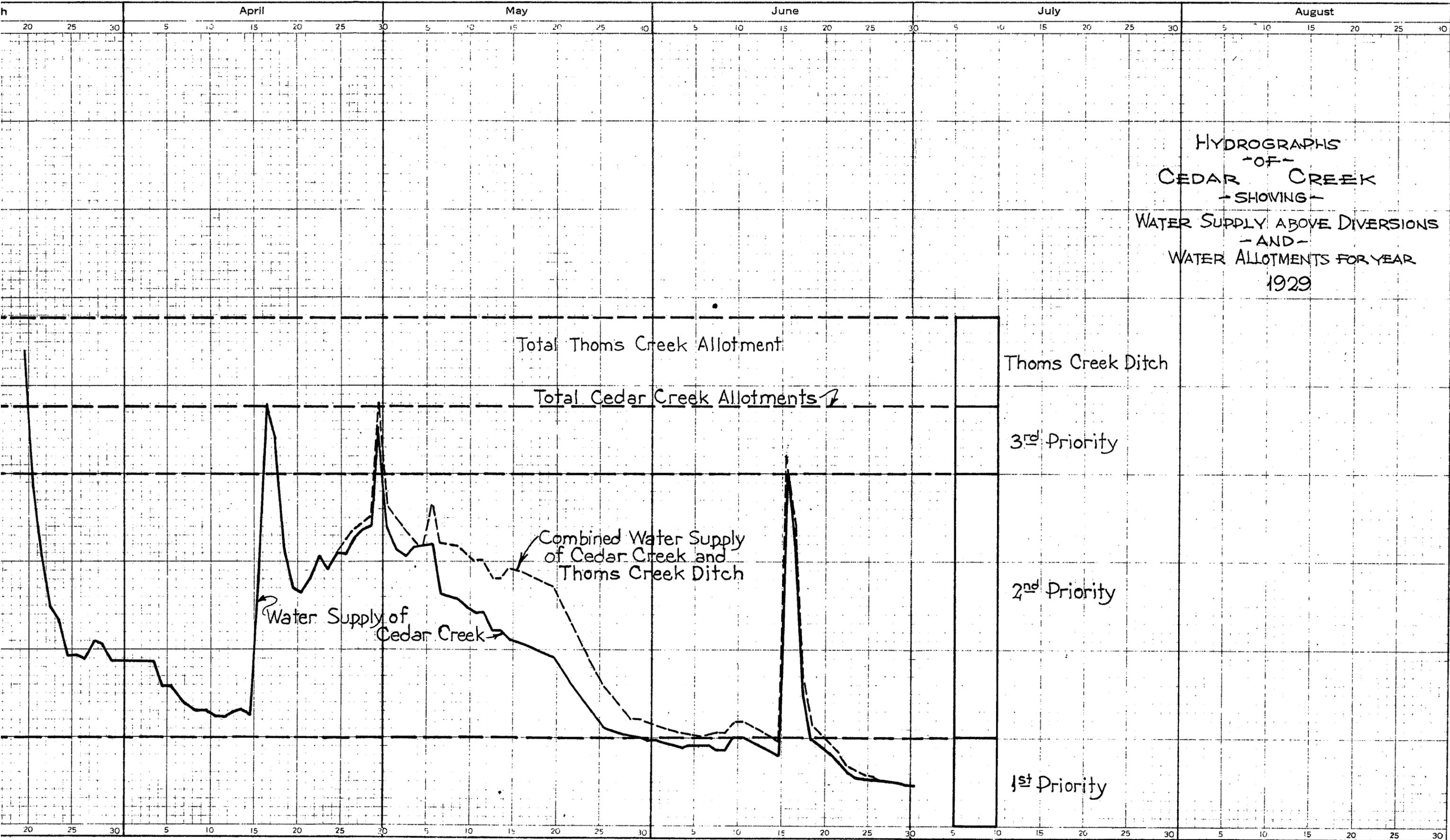
TABLE 16

GROSS USE OF WATER FOR ACREAGE IRRIGATED
FROM CEDAR CREEK DURING SEASON OF 1929 *

: Diversion : Number	: Diversion : Ditch	: Property : Owner	: Period of : Irrigation	: Total : Acre Feet : Diverted	: Acreage : Irrigated : 1929	: Gross Use	
						: During Period	: Acres per : C.F.S.
: 1	: Mc Culley	: L. E. Mc Culley	: 3/19 to 6/30	: 603.4	: 250.0	: 2.42	: 85
: 3	: Sizer	: T. B. Sizer	: 4/17 to 6/9	: 87.5	: 40.0	: 2.19	: 49
: 4	: Fink	: R. O. Fink	: 4/16 to 6/25	: 90.6	: 42.0	: 2.16	: 66
: 5	: Wallace	: F. L. Wallace	: 3/19 to 6/25	: 173.3	: 78.0	: 2.22	: 89
: 6	: Toney South	: J. L. Toney	: 4/12 to 5/25	: 60.1	: 30.0	: 2.00	: 43
: 8	: Street	: Norton & Marsh)	: 3/19 to 5/24	: 321.1	: 160.0	: 2.07	: 66
		: H.E. Rinehart)					
		: O. Crampton)					
: 9	: Acty	: H. Acty	: 3/19 to 4/29	: 31.4	: 20.0	: 1.57	: 53
: 10	: Beebe	: Grace L. Beebe	: 3/19 to 6/24	: 167.6	: 75.0	: 2.24	: 60
: No Number	: Lower Chan-	: M.H. Rinehart)	: 3/19 to 6/18	: 413.0	: 215.0	: 1.92	: 63
	: nel	: W.E. Hill)					
		: H.L. Hill)					
		: H.O. Hughes)					
	: Total		: 3/28 to 6/4	: 1948.0	: 910.0	: 2.14	: 63

* Includes water from Thoms Creek.

PLATES



HYDROGRAPHS
 -OF-
 CEDAR CREEK
 -SHOWING-
 WATER SUPPLY ABOVE DIVERSIONS
 -AND-
 WATER ALLOTMENTS FOR YEAR
 1929