STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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REPORTS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, STATE ENGINEER

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REPORT ON

WATER MASTER SERVICE

ON

SHASTA RIVER AND ITS TRIBUTARIES

SISKIYOU COUNTY, CALIF.

1941 SEASON

By
P. E. Stephenson
Assistant Hydraulic Engineer

Sacramento, California

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SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

October 13, 1942

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention Mr. Gordon Zander
Supervising Hydraulic Engineer

Dear Sir:

Herewith is submitted the annual report covering water master service within the Shasta River Water Master District, Siskiyou County, California, during the 1942 season.

The report presents a general description of the work and a discussion of the results obtained. Records of precipitation, runoff and other pertinent data are included.

Respectfully submitted,

P. E. Stephenson
Assistant Hydraulic Engineer

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Report on

Water Master Service

on

Shasta River and Tributaries

Siskiyou County, California

1941 Season

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INTRODUCTION

The Shasta River Water Master District was created by order of the Division of Water Resources under date of March 1, 1933, to embrace the water rights on Shasta River and its tributaries in Siskiyou County, California, excepting certain tributaries and springs named in said order, as established by Decree of the Superior Court, Siskiyou County, California, in the Shasta River Proceeding No. 7035, entered on December 30, 1932. Subsequent to creation of the district, the boundaries were changed to exclude the water rights on Willow Creek and its tributaries by "Order Changing Shasta River Water Master District, Siskiyou County, California, and Containing a Description of all of the Lands Within Said District as so Changed", dated December 30, 1935.

Water master service in the Shasta River Water Master District was carried on throughout the 1941 season in accordance with the "Distribution of Water" procedure contained in Sections 37 to 37f, inclusive, of the Water Commission Act. Such service extended over the period from April 1 to September 30. P. E. Stephenson, Water Master, Shasta River Water Master

District, administered the distribution of water from the streams within the district during the entire period. Harrison Smitherum was Supervising Water Master.

Water Supply

Precipitation

Data on precipitation, as compiled from the records of the U.S. Weather Bureau kept at Mount Shasta City and Montague and from the Division of Water Resources records at Edgewood, are presented in Tables 1 and 2 of this report. Snow survey records taken at stations located on the watershed tributary to Shasta River are also presented in Table 2.

Based upon the data presented in the above mentioned tables the total precipitation for the 1940-41 season was 40.92 inches, or about 173 per cent of the mean for the 52-year period 1889 to 1941. During the period from October 1 to April 1, the precipitation was 30.62 inches as compared with a long time mean of 18.88 inches for the same period. Unusually heavy precipitation occurred during April, May and June, accounting for 8.61 inches of the total as compared to a mean of 3.71 inches for the same period. Intermittent showers over the remaining three months accounted for 1.69 inches of precipitation as compared to a mean of 1.17 inches. The water content of the snow pack at the head of Parks Creek as of April 1, 1941, was 54.6 inches. The mean over a period of 6 years at this station is 36.3 inches.

Stream Flow

Stream flow measuring stations, equipped with water stage recorders, were maintained on the streams listed below. The Shasta River station at Edgewood Bridge is maintained throughout the year by the Montague Water

Conservation District. The other stations are maintained only during the period of water master service, April 1 to September 30 of each year. Intermittent measurements of the various springs within the area were also obtained.

The records of discharge for the several streams and springs are presented in Tables 3 to 12, inclusive, submitted at the end of this report.

Shasta River above Edson-Foulke Yreka Ditch

Parks Creek above Edson-Foulke Parks Creek Ditch

Parks Creek above Robertson Ranch (8' weir)

Shasta River at Edgewood Bridge

Shasta River near Montague

Little Shasta River above Harp Ditch

Measuring stations equipped with water stage recorders were also maintained on streams, reservoirs and diversion conduits at critical control points, as an aid in the distribution of the available water supply. A list of these stations follows:

Beaughan Creek below Long-Bell Mill Pond (2' Parshall Flume).

M.W.C.D. Parks Creek Canal at Head.

Lake Dwinnell Reservoir.

Soule Ditch at Head (4' weir).

Dennis-Terwilliger weir at Soule Dam (8' weir).

Jones Take Out from M.W.C.D. Shasta River Canal (4' weir).

McKee Takeout from M.W.C.D. Shasta River Canal (4' weir).

Big Springs Takeout No. 1 from M.W.C.D. Shasta River Canal.

Big Springs Takeout No. 2 from M.W.C.D. Shasta River Canal.

M.W.C.D. Shasta River Canal at Big Springs-Little Shasta Road Crossing.

Water supply conditions during the 1941 season were entirely satisfactory throughout the major portion of the district. Sufficient irrigation water was available during the entire season to meet all irrigation demands, with the exception of the Little Shasta River Area. A comparison of the run-off for the past eight seasons is presented in the following tabulation:

Name of Stream	1934	1935	1936	1937	1938	1939	1940	1941
Shasta River above Yreka Ditch	4420	8510	7440	13600	19100*	4090	14800	33300
Parks Creek " Duke N Ditch	2550	6100	6560	11000	14400*	4490	16000	18100
Little Shasta River	850	5630	6520	5680	6060**	3270	4160	4480
Beaughan Spring	2020	1960	1860	1820	1950	1810	1810	2200
Big Springs	12400	12200	12100	12100	---	12100	----	----
Carrick Spring	2090	2090	2050	2020	2110	2000	2070	2700
Cleland Spring	2400	2420	2400	2410	2790	3060	3070	3170

* Does not include April Run-off.
** Period May 14 to September 30, inclusive.

Distribution of Water

Distribution for the 1941 season followed the practices initiated during past seasons with little modification. The results accomplished in the several sections into which the stream system has been divided follow:

Shasta River above Confluence of Boles Creek:

The water supply available to this area is the summation of the flow of Shasta River above the Edson-Foulke Yreka Ditch, Table 3 hereof, and

the combined discharge of the Dow Eddy Creek Ditch and the Hammond-Scott Ditch diverting from Eddy Creek, Table 11 hereof. A summary of the distribution for the 1941 season is set forth in the following tabulation.

	Average Available Water Supply Cu.Ft.Per Sec.	Distribution in per cent of Priority Allotments		
		Hammond-Scott	Foulke et al.	Dow
April	121	100	100	100
May	178	100	100	100
June	152	100	100	100
July	100	100	100	90
August	38.7	76	91	0
September	18.6	76	41	0

This area had sufficient water during the entire irrigation season to satisfy all irrigation demands, with the exception of the Dow lands served by the Dow Eddy Creek Ditch. However, a full irrigation head was available to said ditch for approximately two months longer than normal.

Shasta River below Junction of Boles Creek and Boles Creek

One hundred per cent allotments were available for all priorities including the storage rights of Montague Water Conservation District, up to about August 15. Subsequent to that date the available water was distributed on an equal and correlative basis among water right owners down to and including Frank H. Mills. Under this arrangement an average of 100 per cent of allotments was delivered.

Shasta River below Lake Dwinnell Reservoir

Water master service on this section of the stream system involves the operation of the Montague Water Conservation District's Lake Dwinnell Reservoir during the irrigation season. The water master, in cooperation with the District, exercises control over deliveries from the reservoir both to the District and to the water right owners below the reservoir, who are entitled to water from the reservoir in accordance with agreements with the District.

Deliveries of water to the water right owners below the reservoir commence on May 1 and extended to September 30. There were 13,600 acre feet of storage in the reservoir at the end of the season.

Delivery of water for District use commenced on May 1 and continued until September 30. A total of 5970 acre feet of water was sold to the Big Springs Irrigation District during the same period.

During the month of April the District allowed the use of water without compensation for same. The estimated use during this month was as follows:

Big Springs Irrigation District	500 ac. ft.
Montague Water Conservation District	400 ac. ft.
Prior Rights	100 ac. ft.
	1000 ac. ft.

Summaries of the operation of the reservoir during the 1941 season are given in the following tabulations:

Operation of Lake Dwinnell Reservoir During 1941 Season

Date	Storage: On Hand Acre-feet	Storage: Draft Acre-feet	Inflow to Reservoir Acre-feet	Total Draft Acre-feet	Measured Release Acre-feet	Seepage and Evaporation Loss from Reservoir Acre-feet
April 1	31,680					
May 1	25,400	-6280	14,100	20,380	17,800	2580
June 1	27,430	+2030	16,000	13,970	7,870	6100
July 1	29,460	+2030	10,300	8,270	2,840	5430
Aug. 1	24,880	-4580	5,620	10,200	4,530	5670
Sept. 1	17,480	-7400	1,100	8,500	4,090	4410
Oct. 1	13,600	-3880	940	4,820	2,000	2820
Totals		18,080	48,060	66,140	39,130	27,010

- Draft + Increase

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Deliveries from Lake Dwinnell Reservoir
to
Prior Water Right Owners Below Reservoir
During 1941 Season

Name of Water Right Owner	Allotment as per Agreement Acre-feet	Amount delivered from Lake Dwinnell Reservoir for 1941 Season: Acre-feet	Per Cent of Allotment
J. L. Jones	198	198	100
John Soule	692	561*	81
J. W. and Mary L. Dennis	696	631*	91
McKee Company	1200	1200	100
E. S. Terwilliger	596	50*	8
Totals	3382	2640	76

*Leakage from the reservoir provided additional water sufficient to supply full irrigation demands.

Summary of Deliveries from Lake Dwinnell Reservoir
During 1941 Season

Month	Measured Release Ac. Ft.	Deliveries in Acre Feet: Waste	Prior Rights	Big Spgs I.D.	*M.W.C.D.	Total	Canal Loss
April	17,800	17,800**				17,800	0
May	7,870	3,800	544	1,230	1,720	7,294	576
June	2,840		570	880	760	2,210	630
July	4,530		714	1,500	1,510	3,724	806
August	4,090		390	1,510	1,220	3,120	970
September	2,000		422	850	320	1,592	408
Totals	39,130	21,600	2,640	5,970	5,530	35,740	3,390

*Measured at Big Spring-Little Shasta Road Crossing
**Approximately 1000 ac.ft. of this applied to beneficial use.

Additional data pertaining to the operation of Lake Dwinnell Reservoir are contained in Tables 13, 14, 15, 16, 17, 18 and 19, listed in the index of this report.

Beaughan Creek

One measurement was made during the 1941 season at the 8.0 foot rectangular weir (Long-Bell Upper Weir) located at the head of Beaughan Creek. The results are given below:

Date	Gage Height in Feet	Discharge in c.f.s.
6-11-41	0.38	6.16

This amount of water was sufficient to supply approximately 74 per cent of the total second priority allotments of 8.28 cubic feet per second. Distribution to the second priority water right owners was made in accordance therewith during the 1941 season.

The Long-Bell Lumber Company diverts practically the entire flow of

Beaughan Creek. After use thereof at its sawmill the downstream users' share of the available water, or 65 per cent of the measured flow at Long-Bell Upper Weir, is returned to Beaughan Creek at the 2' Parshall Flume below Long-Bell Mill Pond. Based on the measurements the amount of water available at the said Parshall Flume should equal 4.00 cubic feet per second during the 1941 season. A record of delivery at this point is submitted in Table 12 at the end of this report.

It will be noted from Table 12 that the average monthly flow is from 122 to 153 per cent of the required flow. This excess flow was prorated among the various water right owners to fill their second priority right allotments.

Carrick Creek

There was sufficient water available on this stream during the 1941 season to satisfy all irrigation requirements throughout the entire season.

The results of intermittent measurements of Carrick Spring are set forth in Table 9 of this report.

Parks Creek

Distribution on Parks Creek for the 1941 season was in accordance with the practices followed during the past seasons. A summary of the distribution made during the 1941 season is set forth in the following tabulation:

Month	Measured Water Supply Cu. Ft. Per Sec.	Distribution in Per Cent of Priority Allotments			
		Duke 1	Caledonia 2	Foulke 2	Robertson 4, 6, 11, 12 and 15
April	64.8	100	100	100	100
May	104	100	100	100	100
June	76.6	100	100	100	100
July	33.3	100	100	100	80
August	11.8	100	100	47	36
September	9.5	100	100	23	36

Records of the flow available for the above distribution are set forth in Tables 4 and 5 of this report.

The fifth priority rights from the North Branch of Parks Creek were supplied with 100 per cent of their allotments until about August 1; however, the water available to these rights failed entirely on about August 15.

The 21st and 24th priority rights of M. A. Silva on the extreme lower end of Parks Creek received 100 per cent allotments throughout the season.

Big Springs

The Big Springs Irrigation District was supplied with irrigation water from the M.C.W.D. Shasta Canal from May 1 to September 30, 1941. This water was purchased from the Montague Water Conservation District. The Big Springs Irrigation District received free water from the same source for one complete irrigation in April, during the time water was being wasted from Lake Dwinnell Reservoir in an effort to keep the reservoir level at a fixed gage height. The daily delivery to the Big Springs Irrigation District is set forth in Table 16 of this report.

Stallcup and Sons Company elected to operate its own pumping plant, rather than purchase water ffom the Montague Irrigation District as was done in 1940. The plant was put in operation on April 17 and was run intermittently as required throughout the season.

Louie Brothers diverted water through the Louie-Rose and Coonrod Ditches throughout the season.

The water supply available to Stallcup and Louie Brothers and to the water users on Lower Shasta River was in excess of requirements, consequently, no regulation was necessary on Big Springs during the season.

Lower Shasta River

The water supply available for this section of the stream was in excess of requirements. All ditches were operated without regulation throughout the season.

The following tabulation sets forth the average diversion made by the Shasta River Water Association and the Grenada Irrigation District during the 1941 season along with the water available to the water users below Montague Bridge during the same period.

Month	Average Available Water Supply Flock, et al Cu.Ft. per Second	Average Diversion Shasta River Water Assn. Cu.Ft. per Second	Average Diversion Grenada Irrigation District Cu.Ft. per Second
April		33.6 **	23.7 *
May	257	27.7	13.3
June	157	21.9	15.5
July	102	33.6	14.1
August	94	29.5	16.5
September	107	28.8 ***	16.3

* 5 day period
** 9 day period
*** 16 day period

The daily discharge in cubic feet per second of Shasta River at Montague Bridge is set forth in Table 8 of this report.

The daily diversions in cubic feet per second of Shasta River Water Association and Grenada Irrigation District are set forth in Tables 20 and 21, respectively.

Little Shasta River

Precipitation and the snow pack werelight on the Little Shasta River watershed. This condition was reflected in the run-off of the stream for the 1941 season, which was slightly less than the mean for the past eight years, whereas the run-off of Shasta River and Parks Creek was approximately 260 and 180 per cent, respectively, of the mean for the same period. Intensive regulation on the stream was commenced on June 8 when the available water supply was only sufficient to satisfy 70 per cent of Fifth Priority allotments. The flow of Cleland Springs was sufficient to supply full allotments to the First and Fourth Priorities and to maintain 100 per cent delivery to the Third Priority throughout the season.

A summary of the distribution during the 1941 season is shown in the following tabulation:

Month	Available Water Supply		Distribution in Per Cent of Priority Allotments						
	Cubic Feet Per Second	% of Total Allotment	1	2	3	4	5	6	7
April	29.7	38	100	100	100	100	100	100	100
May	37.6	48	100	100	100	100	100	100	0
June	22.3	29	100	100	100	100	70	0	0
July	13.4	17	100	100	100	100	20	0	0
August	11.8	15	100	100	100	100	10	0	0
September	11.3	15	100	100	100	100	20*	0	0

*Part of Martin's Cleland Spring water was turned to Little Shasta River on September 10th, which accounts for the increase in Fifth Priority allotments during September.

The flow of Little Shasta River above Harp Ditch is set forth in Table 8 of this report.

Intermittent measurements of the discharge of Cleland Springs are recorded in Table 10 of this report. The following tabulation was compiled from measurements made during the period 1935 to 1941, inclusive. This tabulation, together with the precipitation records in Table 1, indicates how the flow of Cleland Springs responds to changes in precipitation conditions.

Cleland Springs

Year	Discharge - Cubic Feet Per Second		
	Beginning of Season	End of Season	Mean
1935	6.81	6.62	6.65
1936	6.50	6.72	6.60
1937	6.50	6.78	6.65
1938	7.10	10.0	7.70
1939	8.77	8.25	8.44
1940	7.84	9.56	8.48
1941	8.39	9.04	8.60

Table 1

AVERAGE OF PRECIPITATION AT MOUNT SHASTA CITY (elevation 3555) AND MONTAGUE (elevation 2523) 1889 TO 1941

Monthly, Seasonal and Average Amounts in Inches

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Seasonal
1930-31	0.41	1.26	0.77	3.59	1.19	1.16	0.41	0.24	2.71	0.00	0.00	0.94	12.68
1931-32	1.95	.92	6.81	2.32	1.13	1.77	1.39	3.20	.50	.19	.00	.00	20.18
1932-33	.46	3.50	2.35	4.98	.64	5.86	.57	1.28	.34	.12	.00	.20	20.30
1933-34	1.24	.02	5.38	2.13	3.16	1.46	1.64	1.16	1.54	.58	.40	.24	18.95
1934-35	2.77	5.29	1.48	4.00	1.63	1.87	3.96	.34	.05	.22	.26	.31	22.18
1935-36	1.14	.96	3.04	6.00	3.76	.74	1.96	1.46	2.11	.34	.62	.14	22.27
1936-37	.02	.00	2.01	3.92	4.91	6.70	1.86	.50	3.20	.15	.00	.26	23.53
1937-38	2.31	6.88	4.54	4.25	8.17	5.88	1.74	.97	.16	.18	.00	.94	36.02
1938-39	1.80	2.34	1.30	2.08	1.06	1.87	.24	1.27	.14	.20	T	1.88	14.18
1939-40	1.00	.52	7.86	5.24	8.55	4.44	1.25	.99	.62	.08	T	2.45	33.00
1940-41	1.44	.90	9.88	5.34	7.64	5.42	4.72	2.25	1.64	.58	.65	.46	40.92
Totals	80.97	147.61	197.17	213.29	188.75	153.69	88.21	66.05	38.42	12.09	12.50	36.49	1235.24
Mean 52 Yrs.	1.56	2.84	3.79	4.10	3.63	2.96	1.70	1.27	.74	.23	.24	.70	23.76

Precipitation at Edgewood - Elevation 2952

1933-34											0.38	0.00	
1934-35	1.30	3.53	1.08	1.65	1.15	2.62	2.58	0.43	0.57	0.38	.06	.21	15.56
1935-36	.81	.82	1.51	3.15	1.65	1.22	1.08	1.04	.45	.15	.00	.13	12.02
1936-37	.00	.00	.41	1.90	1.28	3.53	.86	1.06	1.27	.00	.00	.33	10.64
1937-38	1.52	3.49	4.24	3.47	5.45	5.16	.96	.89	.35	.08	.00	.60	26.21
1938-39	1.31	1.75	.44	1.17	.53	1.79	.56	.37	.51	.55	.37	1.27	10.62
1939-40	1.27	0.38	5.77	2.45	5.37	3.12	.92	.91	.68	.01	T	2.61	23.49
1940-41	2.61	.64	9.30	2.25	7.86	6.36	4.51	1.55	1.42	.29	.78	.07	37.64

Table 2

Monthly Precipitation for Seasonal Year 1940-41

Compared with Mean Monthly Precipitation 1889 to 1941

Month	Monthly Mean-52 Years		Monthly 1940-41		Snowfall at Mt. Shasta City in Inches Elevation 3555	
	Inches	Per Cent of Total	Inches	Per Cent of Total	Normal	1940-41
October	1.56	6.6	1.44	3.5		
November	2.84	12.0	.90	2.2		
December	3.79	16.0	9.88	24.2	23.2	7.
January	4.10	17.2	5.34	13.1	36.0	24.5
February	3.63	15.3	7.64	18.7	22.0	2.0
March	2.96	12.4	5.42	13.2	18.1	3.5
April	1.70	7.2	4.72	11.5	4.2	5.0
May	1.27	5.3	2.25	5.5		
June	.74	3.1	1.64	4.0		
July	.23	1.0	.58	1.4		
August	.24	1.0	.65	1.6		
September	.70	2.9	.46	1.1		
Totals	23.76	100.0	40.92	100.0	103.5	42.0

Snow Survey Records

Year	Water Content of Snow as of April 1 - Inches	
	Parks Creek Elevation 6500	Sweetwater Elevation 5500
1936	36.8	16.5
1937	31.8	18.4
1938	33.3	27.0
1939	24.8	10.5
1940	36.3	6.3
1941	54.6	18.8
Totals	217.6	97.5
Mean 6 Years	36.3	16.2

TABLE 3

Daily Discharge in Cubic Feet Per Second

SHASTA RIVER ABOVE EDSON-FOULKE YREKA DITCH

April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	220	155	130	112	47	26
2	180	164	130	112	42	26
3	146	164	130	119	42	20
4	146	155	130	119	42	14
5	155	153	130	119	41	14
6	138	146	130	119	41	13
7	146	143	130	119	40	13
8	122	164	119	119	40	13
9	130	164	115	119	40	12
10	108	164	123	119	38	9
11	101	164	138	112	36	9
12	94	164	155	112	36	9
13	94	210	161	105	35	9
14	97	172	151	105	33	8
15	106	146	139	105	33	8
16	101	146	137	99	30	8
17	94	138	146	92	44	8
18	85	115	155	85	35	9
19	81	108	138	79	30	9
20	79	115	127	79	26	9
21	80	138	123	79	26	9
22	84	155	130	75	23	11
23	96	190	123	78	22	11
24	101	240	130	62	21	11
25	123	240	115	57	22	11
26	127	230	108	54	22	11
27	130	210	105	54	22	11
28	135	190	105	54	21	11
29	164	190	105	52	20	11
30	164	184	108	47	20	11
31		155		47	20	
Tot. Sec. Ft. Days	3627	5172	3866	2808	990	354
Mean Sec. Ft.	121	167	129	9.05	31.9	11.8
Total Ac. Ft.	7190	10,300	7670	5570	1960	700

Total Acre Feet for Period 33,400

TABLE 4

Daily Discharge in Cubic Feet Per Second

PARKS CREEK ABOVE DUKE NORTH DITCH

April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	61	102	87	54	14.8	11.6
2	61	99	87	63	14.7	11.6
3	61	96	87	57	14.6	11.3
4	79	92	87	55	14.5	11.0
5	61	90	87	52	14.0	11.0
6	54	89	87	47	13.5	10.8
7	51	91	87	45	12.3	10.6
8	49	104	84	42	12.3	9.8
9	51	107	72	42	12.5	9.1
10	49	112	72	40	12.6	9.0
11	45	139	92	36	11.0	9.0
12	42	141	99	35	10.5	9.0
13	44	117	94	34	10.5	9.0
14	49	104	89	32	10.5	9.0
15	50	99	87	30	11.0	9.0
16	51	103	85	35	11.5	9.0
17	49	105	74	33	12.0	9.0
18	54	92	89	27	12.6	9.0
19	55	84	77	25	12.8	9.0
20	57	89	69	26	12.6	9.0
21	64	104	66	23	12.0	9.0
22	74	114	64	23	11.5	9.0
23	79	127	66	21	10.5	9.0
24	81	129	67	19	10.0	9.0
25	82	119	61	19	9.5	9.0
26	89	113	58	19	9.8	9.0
27	91	104	57	19	9.9	9.0
28	107	94	57	26	10.1	9.0
29	102	89	57	19	10.1	9.0
30	102	87	54	18	10.2	9.0
31		87		17	10.2	
Tot. Sec. Ft. Days	1944	3222	2299	1033	364.6	285.8
Mean Sec. Ft.	64.8	104	76.6	33.3	11.8	9.5
Total Ac. Ft.	3850	6390	4560	2050	723	567

Total Acre Feet for Period 18,100

TABLE 5

Daily Discharge in Cubic Feet Per Second

PARKS CREEK AT ROBERTSON WEIR

July 1 to September 30, 1941

Day	July	August	September
1	16.0	4.3	7.3
2	16.0	4.3	7.9
3	16.0	4.3	8.6
4	16.0	4.7	8.1
5	16.0	4.7	7.6
6	16.0	4.7	7.1
7	16.0	4.7	6.6
8	16.0	3.3	5.6
9	16.0	3.3	5.2
10	16.0	3.9	5.9
11	16.0	4.1	6.1
12	16.0	4.1	6.1
13	16.0	4.7	5.9
14	16.0	5.4	5.6
15	16.0	5.4	5.2
16	16.0	5.2	4.7
17	16.0	5.0	4.5
18	16.0	10.3	4.3
19	10.8	10.0	4.5
20	9.4	8.6	4.5
21	8.1	7.9	5.4
22	8.4	7.6	5.2
23	8.6	7.3	5.2
24	8.9	7.3	5.0
25	8.1	7.1	5.0
26	7.9	6.6	4.7
27	8.4	5.4	4.5
28	8.4	5.9	4.5
29	7.9	6.6	4.5
30	6.4	6.6	4.5
31	5.4	6.6	
Tot. Sec. Ft. Days	394.7	179.9	169.8
Mean Sec. Ft.	12.7	5.8	5.7
Total Ac. Ft.	783	357	337

Total Acre Feet for Period 1480

TABLE 7

Daily Discharge in Cubic Feet Per Second

SHASTA RIVER NEAR MONTAGUE

April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	630	234	254	122	103	93
2		194	246	122	93	102
3		198	234	122	93	111
4		210	218	122	96	121
5		202	206	122	96	140
6		176	206	122	89	117
7	530	174	210	119	79	121
8		210	200	107	86	102
9		238	126	100	86	93
10		262	128	86	86	93
11	540	326	130	86	82	93
12		370	122	86	79	93
13		410	126	89	79	93
14		410	126	100	79	89
15		370	126	96	77	94
16		332	126	107	75	98
17		316	126	100	72	103
18	490	304	126	96	102	105
19		292	126	91	130	105
20	230	274	126	89	132	107
21		230	126	89	134	107
22		176	126	89	122	111
23		180	122	86	122	111
24	220	198	126	89	134	113
25		234	150	89	124	115
26	210	256	162	96	102	117
27		242	166	96	72	117
28	220	220	158	96	67	117
29		220	146	111	72	119
30	240	234	130	111	79	119
31		266		111	82	
Tot. Sec. Ft. Days		7958	4700	3147	2924	3219
Mean Sec. Ft.		257	157	102	94.3	107
Total Ac. Ft.		15800	9300	6240	5800	6380

Total Acre Feet - 5 Months Period - 43,500

Note: Intermittent readings were taken during April.

TABLE 8

Daily Discharge in Cubic Feet Per Second

LITTLE SHASTA RIVER ABOVE HARP DITCH

April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1	15.0	24.3	20.7	8.3	2.7	4.1
2	15.0	25.5	19.0	7.6	2.6	5.3
3	15.0	29.0	17.2	7.4	2.8	3.8
4	17.2	29.0	16.3	7.0	2.8	3.0
5	16.8	29.0	15.0	6.2	2.8	2.7
6	16.8	26.9	17.2	5.9	2.6	2.5
7	16.8	27.6	16.8	5.9	2.6	2.4
8	17.2	64.0	15.0	5.9	2.7	2.3
9	25.5	45.0	14.2	5.9	4.1	2.2
10	32.6	35.4	13.4	5.9	3.6	2.1
11	29.0	33.5	12.4	5.8	3.3	2.0
12	31.1	32.6	11.8	5.8	2.8	2.1
13	26.9	31.8	10.9	5.8	2.8	2.1
14	25.5	31.1	10.6	5.6	2.8	2.1
15	26.2	27.6	10.3	4.9	2.7	2.1
16	21.9	25.5	10.6	4.9	2.6	2.1
17	20.7	24.3	10.9	5.6	2.8	2.1
18	18.6	30.4	21.3	4.9	4.1	2.0
19	18.1	27.6	16.3	4.3	2.9	2.1
20	17.7	25.5	12.4	4.1	2.8	2.2
21	17.7	24.3	10.6	3.5	2.7	2.2
22	17.7	23.1	9.5	2.8	2.6	1.8
23	17.7	24.3	10.3	2.8	2.6	2.1
24	19.5	29.0	11.5	2.8	2.5	1.8
25	20.1	26.9	13.4	2.9	2.6	1.8
26	25.5	31.1	16.3	3.0	2.5	1.9
27	25.5	21.3	15.0	3.1	2.4	1.7
28	24.3	19.0	11.5	3.5	2.5	1.7
29	23.7	26.9	10.0	3.0	2.4	1.7
30	23.7	27.6	9.5	2.8	2.5	1.7
31		23.1		2.8	2.6	
Tot. Sec. Ft. Days	639.0	902.2	409.9	150.7	86.8	69.7
Mean Sec. Ft.	21.3	29.1	13.7	4.8	2.8	2.3
Total Ac. Ft.	1270	1790	813	298	172	138

Total Acre Feet for Period 4480

TABLE 9

Discharge in Cubic Feet Per Second

CARRICK SPRING

April 1 to September 30, 1941

Day	June	July	Aug.	Sept.
1				
2				
3				6.60
4				
5				
6				
7				
8				
9				
10	7.86			
11				
12				
13				
14				
15				
16				
17	7.50		6.80	
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31		7.07		

TABLE 10

Discharge in Cubic Feet Per Second

CLELAND SPRING

April 1 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1					8.84	
2				8.54		
3						
4						
5			8.63			
6						
7						
8						
9						
10						
11						
12						
13						
14						
15					9.04	
16						
17						
18						
19						
20						
21						
22						
23						
24						
25				8.68	9.04	
26						
27						
28						
29	8.39					
30						
31						
Mean Sec. Ft.	8.4	8.5	8.6	8.6	9.0	9.0
Total Ac. Ft.	500	523	512	548	553	535

Total Acre Feet - Six Months Season - 3170

TABLE 11

Discharge in Cubic Feet Per Second

DOW AND HAMMOND - EDDY CREEK DITCHES

April 1 to September 30, 1941

Day	May	June	July	Aug.	Sept.
1					
2					
3					
4					
5					
6					
7				6.75	
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21		10.46	10.46	6.75	6.75
22	10.46				
23					
24					
25					
26					
27					
28			8.91		
29					
30					
31					

Dow Eddy Creek Ditch was closed on July 28.

TABLE 12

Discharge in Cubic Feet Per Second

BEAUCHAN CREEK BELOW LONG BELL MILL POND

June 28 to September 30, 1941

Day	June	July	Aug.	Sept.
1		5.34	4.69	5.02
2		5.44	5.88	5.02
3		5.44	6.00	5.02
4		5.44	5.88	6.22
5		6.22	5.77	6.00
6		6.00	5.88	5.88
7		5.44	5.55	5.66
8		5.12	5.77	5.66
9		5.44	6.11	6.11
10		5.55	6.11	6.00
11		4.81	6.22	6.11
12		5.23	6.80	5.88
13		5.55	7.27	5.77
14		5.44	6.26	5.66
15		4.91	5.02	5.55
16		4.91	4.81	5.66
17		4.91	6.00	5.44
18		4.91	6.22	5.44
19		4.91	5.44	5.34
20		5.34	5.55	5.44
21		5.88	5.34	5.34
22		5.34	5.55	5.34
23		5.12	5.77	5.23
24		4.70	6.00	5.23
25		4.11	6.11	5.23
26		3.62	5.66	5.23
27		4.11	5.55	5.23
28	6.44	3.53	5.44	5.23
29	6.11	3.08	5.12	5.23
30	5.77	2.65	5.34	5.23
31		2.82	5.34	
Tot. Sec. Ft. Days	18.32	151.31	178.45	165.40
Mean Sec. Ft.	6.11	4.88	5.76	5.51
Total Acre Feet	36	300	354	328

Total Acre Feet for Period 1018

TABLE 13

Discharge in Cubic Feet Per Second

M.W.C.D. PARKS CREEK CANAL AT HEAD

June 14 to July 9, 1941

Day	June	July
1		25
2		38
3		34
4		30
5		27
6		25
7		11
8		11
9		11
10		0
11		
12		
13		
14	30	
15	28	
16	33	
17	40	
18	33	
19	3	
20	3	
21	3	
22	3	
23	40	
24	50	
25	40	
26	38	
27	36	
28	24	
29	21	
30	17	
31		
Total Second Foot Days	442	212
Total Acre Feet	876	420

420
1296

TABLE 15

Daily Release in Cubic Feet Per Second

LAKE DWINNELL RESERVOIR

February 7 to September 30, 1941

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		350	275	80	40	65	56	67
2		390	275	80	40	65	56	48
3		390	275	80	40	77	56	26
4		390	370	80	40	85	56	14
5		390	460	80	40	85	61	0
6		390	460	80	40	85	65	0
7	24	390	460	80	46	85	65	0
8	100	250	460	80	50	85	70	4
9	200	100	460	160	58	89	75	14
10	310	100	460	240	66	93	75	39
11	360	100	460	240	66	93	75	50
12	360	55	460	240	66	93	71	50
13	360	55	460	240	66	93	68	50
14	360	55	460	240	66	93	69	50
15	360	55	460	240	66	93	72	50
16	360	94	460	240	66	81	75	50
17	360	132	460	240	70	69	75	44
18	130	132	233	240	72	64	75	34
19	48	132	70	240	59	55	75	34
20	44	132	70	155	32	53	73	34
21	44	94	70	70	32	56	65	34
22	44	44	118	70	32	57	60	36
23	44	44	160	72	32	62	59	34
24	44	44	160	75	32	66	59	31
25	44	44	160	65	32	66	59	31
26	44	44	160	56	32	66	62	31
27	44	44	160	48	32	66	67	33
28	315	44	160	40	32	64	67	40
29		44	160	40	32	61	67	40
30		44	133	40	53	61	67	40
31		160		40		58	67	
Tot.Sec. Ft.Days	3999	4732	8989	3971	1430	2284	2062	1008
Total Ac. Ft.	7930	9380	17800	7870	2840	4530	4090	2000

Total Release During Season - 56,400 Acre Feet

TABLE 16

Daily Delivery in Cubic Feet Per Second

BIG SPRINGS IRRIGATION DISTRICT THROUGH
M.W.C.D. SHASTA RIVER CANAL

May 1 to September 30, 1941

Day	May	June	July	Aug.	Sept.
1	33.2	12.2	19.3	25.8	22.4
2	33.4	12.2	20.1	25.7	20.5
3	33.0	15.6	21.1	25.8	13.1
4	37.2	22.4	22.0	25.8	10.5
5	34.9	22.8	22.1	25.9	0
6	27.7	13.7	21.2	25.8	0
7	26.1	13.7	19.5	25.9	0
8	26.1	13.7	19.5	25.8	0
9	26.1	17.7	19.5	25.9	0
10	10.9	25.8	23.1	26.1	6.2
11	0	25.8	26.3	26.1	18.5
12	0	25.9	26.3	26.1	17.4
13	0	25.8	26.3	26.1	22.2
14	0	25.6	26.2	26.0	22.3
15	0	25.3	26.3	25.5	22.0
16	0	25.6	26.1	25.5	22.1
17	19.1	25.8	26.1	25.5	22.0
18	26.2	20.2	26.1	25.5	15.1
19	26.5	7.2	26.3	25.5	15.1
20	26.5	7.0	26.3	25.5	15.1
21	26.8	7.7	26.3	22.3	15.1
22	27.2	7.7	26.2	20.1	15.1
23	27.2	7.7	26.0	20.2	15.1
24	27.8	5.1	26.1	20.1	15.2
25	27.8	0	26.0	19.4	13.9
26	27.7	2.4	26.1	20.0	13.9
27	26.7	5.9	26.0	25.1	13.9
28	25.9	5.9	26.1	25.1	20.1
29	15.1	5.9	26.0	25.1	20.2
30	0	11.3	26.1	25.1	20.1
31	0		26.0	25.1	
Tot. Sec. Ft. Days	618.1	443.6	756.6	763.4	427.1
Total Acre Ft.	1230	880	1500	1510	847

Total Acre Feet for Period 5970

TABLE 17

Daily Discharge in Cubic Feet Per Second

M.W.C.D. SHASTA RIVER CANAL AT BIG SPRINGS -
LITTLE SHASTA ROAD CROSSING

May 1 to September 30, 1941

Day	May	June	July	Aug.	Sept.
1	35	22	24	11	20.0
2	35	26	24	11	11.0
3	35	15	32	11	0.0
4	35	8	40	10	0.0
5	35	8	40	11	0.0
6	35	8	40	15	0.0
7	35	9	42	15	0.0
8	35	13	42	17	0.0
9	34	13	42	22	0.0
10	36	12	40	22	2.0
11	56	11	34	22	6.5
12	56	10	33	22	6.5
13	56	12	33	23	6.5
14	56	14	33	23	6.5
15	55	14	34	23	6.5
16	53	14	27	22	6.5
17	41	16	19	22	6.5
18	30	20	30	22	6.5
19	28	20	13	21	6.5
20	24	20	14	21	6.5
21	23	5	13	23	6.5
22	21	5	11	23	6.5
23	22	5	12	23	6.5
24	26	5	11	24	6.5
25	21	7	11	25	6.5
26	14	12	11	23	6.5
27	12	12	11	22	6.5
28	10	12	11	22	6.5
29	8	12	12	22	6.5
30	26	22	12	21	6.5
31	28		11	20	
Total Sec. Ft. Days	1016	382	762	614	163.0
Total Acre Feet	*2020	760	1510	1220	320

Total Acre Feet for Period 5830

*300 acre feet wasted into Little Shasta

TABLE 18

Summary of Deliveries to Prior Right Owners From

LAKE DWINNELL RESERVOIR

1929 to 1941

Year	Deliveries in Acre Feet						Deliveries in per cent of Allotment
	Jones	Soule	Dennis	McKee	*Terwilliger	Total	
1929	---	---	---	---	---	---	---
1930	190	485	465	923	---	2060	61
1931	198	473	473	909	---	2050	61
1932	---	---	---	---	---	---	---
1933	198	692	687	1130	101	2810	83
1934	159	692	461	922	159	2390	71
1935	198	609	600	1075	234	2720	80
1936	198	637	527	1195	202	2759	82
1937	198	633	489	1200	120	2690	80
1938	198	---	---	1073	---	1271	38
1939	198	692	687	1138	308	3023	90
1940	198	471	562	1105	0	2336	69
1941	198	561	631	1200	51	2641	76

1929 - Record of deliveries missing.

1930 - 1931 Record of deliveries to Terwilliger missing.

1932 - Records missing.

1938 - Soule, Dennis and Terwilliger had sufficient water from reservoir seepage to supply irrigation demands.

1940 - 1941 Reservoir seepage supplied additional water for Soule, Dennis and Terwilliger.

* Accretions to the flow of Shasta River through the Dennis Ranch provide additional water, which is available for diversion by E. S. Terwilliger, in amounts more than sufficient to make up the shortage in the amounts of water delivered from the reservoir.

TABLE 19

RECORD OF OPERATION OF LAKE DWINNELL RESERVOIR - 1929 to 1941.

Year	Reservoir storage on April 1 Ac. Ft.	Inflow: Apr. 1 To Sep. 30 Ac. Ft.	Total Available water supply Ac. Ft.	Maximum Storage in Reservoir Ac. Ft.	Maximum Storage in Reservoir Date	Delivery From Reservoir: M.W.C.D. Ac. Ft.	M.W.C.D. Period	Prior Rights Ac. Ft.	Prior Rights Period	Total Ac. Ft.	Storage in reservoir when delivery to MWCD ceased Ac. Ft.	Seepage and evaporation loss Ac. Ft.
1929				4,500		No record*		No record				
1930				10,500	Mar. 14	5,000	May 5 to July 4	2,060	Apr. 23 to Sep. 5	7,060	2,800	
1931				4,250	Apr. 4	0		2,050	Apr. 1 to July 25	2,050	2,800	
1932	5,500			5,500	Mar. 20	2,000	May 15 to June 15	No record		2,000	2,000	
1933	5,200			6,500	May 3	4,750	Apr. 21 to July 16	2,810	Apr. 10 to Sept. 3	7,560	2,200	
1934	4,850			5,000	Apr. 5	1,500	Apr. 10 to Apr. 23	2,390	Apr. 5 to July 22	3,890	2,800	
1935	5,000	4,620	9,620	5,700	May 10	2,700	May 10 to June 2	2,720	Apr. 9 to Aug. 11	5,420	3,000	4,200
1936	5,460	4,720	10,180	6,020	Mar. 3	1,560	Apr. 14 to May 20	2,760	Apr. 14 to Aug. 11	4,320	3,250	5,860
1937	5,940	14,040	19,980	9,800	May 6	7,360	May 5 to Sept. 15	2,690	Apr. 26 to Sept. 9	10,050	0	9,930
1938	31,600	28,440	60,040	32,100	May 3	23,910**	May 1 to Sept. 30	1,270	May 1 to Sept. 30	25,180	2,850	34,860
1939	7,350	1,210	8,560	7,350	Apr. 1	2,350	Apr. 9 to May 5	3,020	Apr. 4 to Aug. 10	5,370	3,525	3,190
1940	27,350	18,000	~~42,940~~ 45,350	28,000	Apr. 6	18,570*****	Apr. 22 to Sept. 18	2,340	Apr. 17 to Sept. 30	20,900	2,540	22,040
1941	31,680	48,060	79,740	34,400	Apr. 4	36,490	Apr. 1 to Sept. 30	2,640	May 1 to Sept. 30	39,130	13,600	27,010

**** Includes 21,600 acre-feet wasted in April and May through outlet to prevent increase in reservoir level and 5,970 acre-feet delivered to Big Springs Irrigation District.

* In 1929 the District used water only for puddling its canal.

** Includes 831 acre-feet wasted through outlet to prevent increase in reservoir level and 9980 acre-feet delivered by District to Stallcup and Big Springs Irrigation District.

*** Includes 2710 acre-feet wasted in April to maintain reservoir level and deliveries through the entire season to Big Springs Irrigation District.

TABLE 20

Daily Discharge in Cubic Feet Per Second

SHASTA RIVER WATER ASSOCIATION PUMPING PLANT

April 22 to September 21, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1		38.0	0	36.5	34.0	28.5
2		38.0	0	38.0	38.0	0
3		38.0	0	38.0	38.0	0
4		38.0	0	38.0	38.0	0
5		38.0	0	36.0	38.0	0
6		38.0	0	26.0	38.0	0
7		38.0	0	26.0	38.0	0
8		15.8	0	26.0	33.3	19.5
9		0	17.4	35.0	38.0	26.0
10		0	38.0	38.0	38.0	23.6
11		0	38.0	38.0	38.0	26.0
12		0	38.0	38.0	38.0	26.0
13		0	38.0	28.5	38.0	26.0
14		0	38.0	28.5	38.0	34.0
15		26.9	38.0	28.5	38.0	38.0
16		38.0	38.0	30.1	38.0	38.0
17		38.0	38.0	38.0	38.0	38.0
18		38.0	12.7	38.0	29.1	38.0
19		38.0	38.0	38.0	6.3	38.0
20		38.0	38.0	38.0	0	38.0
21		38.0	38.0	38.0	0	23.8
22	7.5	38.0	38.0	38.0	0	
23	30.4	33.3	38.0	38.0	0	
24	38.0	33.3	38.0	38.0	0	
25	36.5	30.1	18.5	34.8	22.2	
26	38.0	38.0	11.5	38.0	38.0	
27	38.0	38.0	11.0	38.0	38.0	
28	38.0	38.0	12.0	32.0	38.0	
29	38.0	38.0	12.0	26.0	30.1	
30	38.0	36.5	31.5	15.2	38.0	
31		0		26.0	38.0	
Total Sec. Ft. Days	302.4	859.9	658.6	1043.1	915.0	461.4
Mean Sec. Ft.	33.6	27.7	21.9	33.6	29.5	28.8
Total Ac. Ft.	600	1700	1310	2070	1810	915

Total Acre Feet for Period 8400

TABLE 21

Daily Discharge in Cubic Feet Per Second

GRENADA IRRIGATION DISTRICT PUMPING PLANT

April 26 to September 30, 1941

Day	Apr.	May	June	July	Aug.	Sept.
1		32.0	0.0	10.4	9.5	9.9
2		32.0	0.0	0.0	17.0	17.0
3		32.0	0.0	0.0	17.0	17.0
4		32.0	0.0	0.0	17.0	17.0
5		32.0	0.0	1.4	18.0	17.0
6		32.0	12.0	17.0	21.0	17.0
7		37.0	21.0	17.0	21.0	17.0
8		37.0	21.0	17.0	21.0	17.0
9		37.0	21.0	18.5	21.0	17.0
10		31.0	21.0	18.3	21.0	17.0
11		0.0	21.0	17.0	21.0	17.0
12		0.0	21.0	17.0	21.0	17.0
13		0.0	21.0	17.0	21.0	17.0
14		0.0	21.0	17.0	21.0	5.7
15		0.0	21.0	13.8	21.0	0.0
16		0.0	21.0	18.8	21.0	0.0
17		0.0	21.0	17.0	21.0	14.0
18		0.0	21.0	17.0	17.5	21.0
19		0.0	3.5	17.0	21.0	21.0
20		0.0	10.5	17.0	13.1	21.0
21		0.0	20.1	17.5	10.5	21.0
22		0.0	21.0	21.0	16.2	21.0
23		0.0	21.0	21.0	0.0	21.0
24		0.0	18.4	21.0	0.0	21.0
25		0.0	17.0	21.0	0.0	21.0
26	10.7	0.0	17.0	21.0	1.7	21.0
27	16.0	0.0	17.0	21.0	21.0	21.0
28	28.0	16.2	17.0	17.2	21.0	21.0
29	32.0	21.0	17.0	7.8	21.0	18.2
30	32.0	21.0	21.0	0.0	21.0	7.1
31		9.6		0.0	15.8	
Total Sec. Ft. Days	118.7	401.8	464.5	436.7	510.3	489.9
Mean Sec. Ft.	23.7	13.3	15.5	14.1	16.5	16.3
Total Acre Feet	235	797	921	866	1010	971

Total Acre Feet for Period 4820