STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

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REPORT ON

WATERMASTER SERVICE

IN

SHASTA RIVER WATERMASTER SERVICE AREA

Siskiyou County, California

1953 SEASON

Sacramento, California
March, 1954

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SUBMISSION TO AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, L. C. Jopson, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, submit this "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1953 Season".

/s/ L. C. JOPSON

Principal Hydraulic Engineer

I, Harvey O. Banks, Assistant State Engineer, Division of Water Resources, Department of Public Works of the State of California, approve this "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1953 Season".

/s/ HARVEY O. BANKS

Assistant State Engineer

I, A. D. Edmonston, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, approve and adopt this "Report on Watermaster Service in Shasta River Watermaster Service Area, Siskiyou County, California, 1953 Season", as a report of the Department of Public Works.

WITNESS my hand and the seal of the Department of Public Works of the State of California, this day of , 1954.

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

/s/ A. D. EDMONSTON

By

A. D. Edmonston
State Engineer

(SEAL)

ORGANIZATION

Frank B. Durkee . . . . . Director of Public Works

A. D. Edmonston . . . . . State Engineer

Harvey O. Banks . . . . . Assistant State Engineer

This report was prepared under the direction of

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By

O. L. Abbott
Associate Hydraulic Engineer
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INTRODUCTION

This is the twentieth annual report on watermaster service in the Shasta River Watermaster Service Area, and covers the period of water distribution in 1953 beginning April 1 and terminating September 30.

The service area was created by order of the Division of Water Resources on March 1, 1933, to include, with certain exceptions, all the water rights determined in the decree entered in the Shasta River Adjudication proceeding on December 30, 1932, Superior Court, Siskiyou County, No. 7035. The service area was changed by order of December 30, 1935, to exclude the water rights on Willow Creek and its tributaries. Watermaster service has been provided during each irrigation season since the service area was created and annual reports prepared to show the work accomplished during each season.

The report is presented herein under four headings as follows: Introduction, Water Supply, Distribution of Water, and Changes in Ownership of Lands and Water Rights. Following the text are tables presenting precipitation data at Yreka and water supply records at various locations within the area.

WATER SUPPLY

Precipitation

Data on precipitation, as compiled from observations made by the United States Weather Bureau at Yreka, are presented in Table. 1. Precipitation for the period from October 1, 1952 to September 30, 1953 was 135 per cent of the mean.

Snow Surveys

Data on water content of snow pack at five representative snow courses on or near the Shasta River stream system as set forth in the bulletin "Water Conditions in California as of April 1, 1953" are presented below:

Snow course	Elevation	Water content of snow in inches		Per cent of mean
		63-year Computed mean	1953	
Parks Creek	6,500	33.7	45.5	135
Sweetwater	5,500	24.3	22.0	90
Mt. Shasta	8,000	56.2	55.1	102
N. Fk. Sacramento	6,800	23.6	27.5	116
Little Shasta	6,200	26.4	27.5	104

Average water content of the snow pack of the five snow courses on April 1 was about 109 per cent of the combined normal for the courses.

Stream Flow

Stream flow measuring stations equipped with water stage recorders were maintained during the period of watermaster service on Shasta River above the Edson-Foulke Yreka ditch, at Edgewood Bridge, and near Montague; on Parks Creek above the Edson-Foulke Yreka ditch, and the 8-foot weir above the Robertson ranch; and on Little Shasta River above the Harp ditch. The stream flow measuring stations on Little Shasta River above Harp ditch and Parks Creek above Edson-Foulke Yreka ditch were maintained in cooperation with the Division of Water Resources Klamath River Basin Investigation. The stream flow measuring station of Shasta River at Edgewood Bridge was maintained in cooperation with the Montague Water Conservation District and the Division of Water Resources Klamath River Basin Investigation. Records of discharge at the stations are presented in Tables 2 through 7.

Intermittent measurements were made of the flows of Carrick and Cleland springs and are recorded in Tables 8 and 9, respectively.

DISTRIBUTION OF WATER

Distribution of water during the 1953 irrigation season was in accordance with the decree entered in the Shasta River Adjudication proceedings and with various agreements and practices developed over the period of water-master service.

To supplement the water supply records referred to under "Stream Flow" and to maintain close observation of diversions and use, fourteen additional water stage recorders were installed at critical points on streams and diversion conduits as follows:

Station	Type of control
Beaughan Creek below Long-Bell mill pond	2 ft. - parshall flume
Beaughan Creek above Jackson ditch	8 ft. - rectangular weir
Boles Creek below lower Enos ditch	4 ft. - rectangular weir
Carrick Creek at Highway 97	3 ft. - rectangular weir
Carrick Creek above upper Jackson ditch	4 ft. - rectangular weir
Dwinnell reservoir in outlet tower	
Soule ditch at head	3 ft. - rectangular weir
Waters and Petersen ditch at head	4 ft. - rectangular weir
Quigley No. 1 and No. 3 headgates	4 ft. - rectangular weirs
White Mountain ranch headgate	4 ft. - rectangular weir
M.W.C.D. bypass canal from Parks Creek	rated section
M.W.C.D. Shasta River canal at head	10 ft. - parshall flume
Big Springs Lake at B.S.I.D. pumping plant	

The water stage recorders located at the Dwinnell Reservoir outlet tower, and at the head of Montague Water Conservation District canal were operated in cooperation with the above named District. The water stage recorder located on the Montague Water Conservation District bypass canal from Parks Creek was operated in cooperation with the above named District and the Division of Water Resources Klamath River Basin Investigation. The recorder located on Beaughan Creek below Long-Bell mill pond was operated in cooperation with the Long-Bell Lumber Company.

A description of the results obtained in each of the sections into which the stream system naturally divides follows:

Shasta River above Junction with Boles Creek

The available water supply in this section of the stream is the summation of the flow of Shasta River above the Edson-Foulke Yreka ditch as set forth in Table 2 and the combined discharge of the Hammond-Scott and Dow Eddy Creek ditches diverting from Eddy Creek. During the 1953 season, there was ample water to satisfy all irrigation demands until about August 15. Thereafter a shortage of water occurred throughout the section and diversion was reduced below requirements on all ditches. A summary of the distribution for the 1953 season is set forth in the following tabulation:

Month	Distribution in per cent of allotments		
	Hammond-Scott	Foulke, et al.	Dow
April	Sufficient to satisfy all demands		
May	Sufficient to satisfy all demands		
June	Sufficient to satisfy all demands		
July	Sufficient to satisfy all demands		
August	100	65	21
September	100	38	0

Boles Creek and Shasta River Below Junction with Boles Creek

The water supply in this section was sufficient to satisfy all priorities having direct flow rights, including the Montague Water Conservation District, until about July 31. Thereafter, by eliminating the rights of the Montague Water Conservation District and distributing the water on an equal and correlative basis, all users down to and including the Mills ranch received an average of 100 per cent of allotments during the entire irrigation season.

During the period from August 6 to September 20, the Alexander ditch received 0.40 cubic foot per second of water for stockwatering purposes only.

The daily discharge of Shasta River at Edgewood Bridge, which is water available to the Mills ranch and the Montague Water Conservation District, is set forth in Table 5.

Dwinnell Reservoir and Shasta River Below Dwinnell Reservoir

Watermaster service on this section of the stream system involves the operation of the Montague Water Conservation District's Dwinnell Reservoir during the irrigation season. The watermaster, in cooperation with the District, exercises control over deliveries from the reservoir to the District and to certain natural flow water right owners below the reservoir.

Deliveries to the water right owners below the reservoir are made in accordance with agreements between the District and the several water right owners. These agreements specify the amount of water to be released to the respective owners in lieu of their natural flow rights. In general, each agreement sets forth the total amount of water in acre-feet measured at the heads of the respective ditches, to which the water right owner is entitled and provides that delivery from the reservoir shall be made upon demand of the water user. All releases of water to the water right owners below the reservoir are subject to the control of the watermaster, who also regulates the releases from the reservoir in accordance with the requirements of the district. Rediversion of the water to the natural flow water right owners below the reservoir is also regulated.

Delivery of water to the district commenced on April 19 and continued throughout the season. Deliveries to the water right owners below the reservoir were made as requested. There was about 11,330 acre-feet of water remaining in storage on September 30. The daily releases from Dwinnell Reservoir as shown in Table 12 are the summation of the deliveries to the natural flow water right owners

below the reservoir, deliveries, to the Fred Quigley ranch as measured by the Montague Water Conservation District, and the discharge through the 10-foot parshall flume near the head of the Montague Water Conservation District canal.

The amount of water diverted from Parks Creek to Shasta River for storage in Dwinnell Reservoir is set forth in Table 10.

Statistical data on the operation of the reservoir during the 1953 season is set forth in the following tabulations:

MONTHLY SUMMARY OF OPERATION OF DWINNELL RESERVOIR
In Acre-Feet

Date	Storage on hand	Change in storage	Inflow to reservoir	Total draft	Measured release	Seepage and evaporation loss
April 1	25,640					
		+ 1,890	6,935 (a)	5,045	1,368	3,677
May 1	27,530					
		+ 2,520	8,755 (a)	6,235	2,266	3,969
June 1	30,050					
		- 960	6,833 (a)	7,793	3,556	4,237
July 1	29,090					
		- 7,420	3,031 (a)	10,451	5,433	5,018
Aug. 1	21,670					
		- 7,460	0	7,460	4,303	3,157
Sept. 1	14,210					
		- 2,880	45	2,925	1,705	1,220
Sept. 30	11,330					
TOTALS			25,599	39,909	18,631	21,278

(a) Not adjusted for consumptive use of water on Mills ranch.

DELIVERIES TO NATURAL FLOW WATER
RIGHT OWNERS BELOW DWINNELL RESERVOIR

Name of water right owner	Allotment as per agreement in acre-feet	Amount delivered from Dwinnell Reservoir	
		Acre-feet	Per cent of allotment
Fred Quigley	198	198	100
John Soule	692	557	80
Anna K. Petersen K. E. Waters and Emily S. Waters	696	696	100
John W. Taylor	1,200	1,104 (a)	92
Clarence Reed and Margaret R. Reed	596	0 (b)	0 (b)
TOTALS	3,382	2,555	76

(a) Additional water released until October 4.
(b) Supplied by seepage from reservoir.

SUMMARY OF DELIVERIES
FROM DWINNELL RESERVOIR

In Acre-Feet

Month	Measured release	Deliveries to natural flow rights	Deliveries to M.W.C.D. canal
April	1,368	261	1,107
May	2,266	341	1,925
June	3,556	297	840
July	5,433	559	4,874
August	4,303	545	3,758
Sept.	1,705	552	1,153
TOTALS	18,631	2,555	13,657

Additional data pertaining to Dwinnell Reservoir are contained in Tables 5, 11 and 12.

Beaughan Creek

One measurement was made during the 1953 season at the 8-foot rectangular weir (Long-Bell upper weir) located at the head of Beaughan Creek. The results are given below:

Date	Gage Height - feet	Discharge - c.f.s.
6-29-53	0.37	5.90

This amount of water is sufficient to supply approximately 71 per cent of the second priority allotments of 8.28 cubic feet per second. Distribution was made on that basis throughout the 1953 season.

The Long-Bell Lumber Company diverts practically the entire flow of Beaughan Creek, including the downstream users' share of the available water for industrial use at its sawmill. After such use, the downstream users' share of the water, which is equivalent to 65 per cent of the measured flow at the Long-Bell upper weir, is returned to Beaughan Creek below the Long-Bell mill pond. During the 1953 season the average amount of water returned to the creek under this arrangement was in excess of the requirement at all times. The available water supply in Beaughan Creek below the return from the mill pond is measured by means of a 2-foot parshall flume.

Carrick Creek

There was sufficient water available in Carrick Creek during the 1953 season to satisfy all irrigation requirements. The results of intermittent measurements of Carrick Springs are set forth in Table 8.

Parks Creek

Distribution on Parks Creek for the 1953 season was in accordance with the practices followed during past seasons. A summary of the distribution is set forth in the following tabulation:

Month	Distribution in per cent of allotments			
	Duke	Caldonia	Foulke, et al.	Robertson
April	Sufficient to supply all demands			
May	Sufficient to supply all demands			
June	Sufficient to supply all demands			
July	100	100	91	74
August	100	100	27	21
September	100	88	1	19

Records of the flow available for the above distribution are set forth in Tables 3 and 4.

The records of diversion of the Montague Water Conservation District bypass canal to Shasta River are set forth in Table 10.

Big Springs

The water supply of Big Springs during the 1953 season increased from an April average of 33 cubic feet per second to an average of 44 cubic feet per second during August and September.

This supply was sufficient to provide 100 per cent of the Taylor and Louie Brothers allotments throughout the season and to provide the Big Springs Irrigation District with an allotment varying from an average of 60 per cent in April to 92 per cent in August. Records of the diversion by the Big Springs Irrigation District during the 1953 season are set forth in Table 13.

During the season the John W. Taylor pump discharged 5.25 cubic feet per second or 70 per cent of his 7.50 cubic feet per second allotment.

Lower Shasta River

During the 1953 season 100 per cent allotments were available for all priorities during the entire season.

A record of the flow available to the water users below the Montague Bridge is presented in Table 6. Records of diversion by the Grenada Irrigation District and the Shasta River Water Association are submitted in Tables 14 and 15, respectively. A summary of these data is set forth in the following tabulation:

Month	Average diversion Grenada Irrigation District	Average diversion Shasta River Water Association	Average available water supply Flock, et al.
	In cubic feet per second		
April	22.5	29.3	97
May	13.0	25.4	263
June	10.1	24.3	313
July	32.8	42.0	39
August	31.2	42.0	45
September	22.2	39.1	73

Little Shasta River

The water supply on this stream was sufficient to satisfy all demands until about July 13. Subsequent to that date and until the end of the season close regulation was necessary. From September 10 until the end of the irrigation season sufficient water was returned to Little Shasta River from the Russ Connick ditch to satisfy 75 per cent of the fifth priority allotments. A summary of the distribution during the 1953 season is set forth in the following tabulation:

Month	Distribution in per cent of priority allotments						
	1	2	3	4	5	6	7
April	Sufficient to supply all demands						
May	Sufficient to supply all demands						
June	Sufficient to supply all demands						
July	100	100	100	100	94	13	0
August	100	100	100	100	56	0	0
September	100	100	100	100	64	0	0

Records of the discharge of Little Shasta River during the 1953 season are set forth in Table 7.

Records of intermittent measurements of the discharge of Cleland Spring during the 1953 season are presented in Table 9.

CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS

The changes in ownership of lands and water rights, which have occurred subsequent to filing "Statement for Shasta River Watermaster Service Area, County of Siskiyou, State of California, for 1953", and which shall be included in the 1954 statement for the service area, are listed in the following tabulation:

Tract No.	Name of water right owner appearing in 1953 statement	Name of water right owner to appear in 1954 statement	Amount of water c.f.s.
5-70	Estate of Alice Alexander	William Wellons	1.35
5-70	Estate of Alice Alexander	Frank Alexander	0.27
5-65	Glenn C. Maxwell	Floyd E. Wright and Elva Mae Wright	2.21
5-2	Grover H. Bower	Beulah M. Bower	Mining
5-59	Orma K. Petersen	Anna M. Petersen	0.64

TABLE 1

PRECIPITATION AT YREKA
SISKIYOU COUNTY, CALIFORNIA
1952-53

In Inches

Month	~~Mean~~ Normal precipitation	1952-53 precipitation
October	1.13	0.34
November	2.44	1.32
December	3.00	7.58
January	2.88	5.55
February	2.36	1.23
March	1.65	2.29
April	1.01	0.72
May	1.03	2.82
June	0.64	1.23
July	0.36	0.00
August	0.26	0.21
September	0.48	0.02
TOTALS	17.24	23.31

TABLE 2

DISCHARGE OF SHASTA RIVER ABOVE EDSON-FOULKE YREKA DITCH
April 1 to September 28, 1953

Mean Daily Discharge in Cubic Feet per Second

Day	April	May	June	July	August	September
1	76	109	105	92	46	14.1
2	78	114	110	95	40	14.6
3	84	122	104	106	39	14.6
4	84	64	101	95	39	14.6
5	86	92	104	94	38	14.6
6	86	115	146	96	37	14.6
7	84	118	158	96	36	14.6
8	84	113	126	90	35	14.6
9	78	103	122	84	33	14.6
10	78	84	104	84	31	14.6
11	76	73	90	84	33	14.6
12	68	70	79	84	31	14.6
13	63	88	79	84	31	14.6
14	63	94	79	84	31	14.6
15	63	92	77	80	28	14.6
16	68	111	95	77	26	14.6
17	68	94	115	75	24	14.6
18	69	88	133	68	21	14.6
19	84	155	123	64	19.5	14.6
20	86	138	107	58	18.0	14.6
21	95	165	107	55	18.0	14.6
22	162	203	99	54	16.4	14.6
23	136	207	123	54	16.4	14.6
24	142	134	130	53	15.7	14.6
25	134	119	127	52	15.7	14.6
26	179	118	97	56	24	14.1
27	254	107	99	56	21	14.1
28	169	101	101	54	19.5	14.1
29	160	103	97	51	18.0	NO
30	109	110	97	51	16.1	RECORD
31	—	135	—	50	15.1	—
Total Sec. Ft. Days	3,066	3,539	3,234	2,276	832.4	406.8
Mean Sec. Ft.	102.2	114.1	107.8	73	26.9	14.5
Total Ac. Ft.	6,080	7,018	6,413	4,513	1,651	807

Total for period - 26,482 acre-feet.

TABLE 3

DISCHARGE OF PARKS CREEK ABOVE EDSON-FOULKE YREKA DITCH

November 6, 1952 to September 30, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
1		9.9	10.2	29	17.9	28	63	79	53	8.5	5.2
2	No	8.2	10.6	30	16.8	30	47	82	54	8.2	4.9
3	Record	7.4	9.9	50	16.8	34	50	81	56	9.2	4.4
4		7.7	9.9	53	16.4	37	84	87	53	9.2	4.2
5		8.8	9.9	47	16.8	41	84	86	54	8.5	3.9
6	3.3	9.9	9.9	54	16.8	41	105	84	53	7.9	3.6
7	5.7	14.6	13.3	59	17.4	37	90	118	53	7.9	3.6
8	5.4	10.2	48	53	19.6	34	70	109	44	8.2	3.4
9	5.7	9.2	198	44	22	30	57	87	40	7.4	3.3
10	5.7	16.4	87	38	26	28	49	81	37	6.8	3.2
11	6.0	15.5	103	34	21	26	45	75	35	6.5	3.2
12	6.8	12.4	184	32	21	24	45	82	34	6.0	3.2
13	8.2	11.0	142	30	20	23	51	79	30	7.9	3.2
14	8.8	10.6	76	28	19.1	22	64	86	28	7.7	3.3
15	7.9	9.9	51	27	18.5	22	62	97	26	6.0	2.8
16	7.4	9.5	42	26	18.5	25	64	105	25	6.2	2.8
17	6.8	9.2	57	24	17.4	24	81	120	22	6.2	2.6
18	7.4	9.2	168	22	16.8	25	87	114	21	6.2	2.7
19	7.7	9.2	151	21	19.1	30	126	100	18	5.7	2.7
20	7.4	9.2	182	19.6	17.9	39	105	90	17	5.2	2.8
21	7.1	8.5	92	19.1	17.9	54	98	86	15	5.2	3.0
22	6.5	8.5	64	19.1	18.5	75	90	87	14	5.4	2.8
23	6.5	8.2	57	18.5	23.2	107	76	81	12	5.4	2.7
24	6.8	8.2	45	17.4	31	92	79	75	12	5.4	2.7
25	7.1	8.2	40	16.8	32	100	68	72	12	5.2	2.6
26	6.5	8.2	35	16.8	30	126	62	65	9.5	5.7	2.7
27	6.5	8.5	32	17.4	30	126	59	65	10.6	5.7	2.7
28	6.2	8.5	30	18.5	32	92	54	62	9.9	5.7	2.8
29	6.2	9.5	28		30	75	63	62	9.9	6.5	2.8
30	6.2	14.6	27		28	59	70	59	9.9	6.0	2.6
31	—	11.7	27		28	—	82	—	9.5	5.0	—
Mean	6.6	10.0	65.6	30.8	21.8	50.2	71.9	85.2	28.3	6.7	3.2
Total Ac. Ft.	329	616	4,033	1,714	1,341	2,986	4,422	5,069	1,740	410	191

Total for period - 22,851 acre-feet.

TABLE 4

DISCHARGE OF PARKS CREEK AT ROBERTSON WEIR
April 1 to September 30, 1953

Mean Daily Discharge in Cubic Feet per Second

Day	April	May	June	July	August	September
1	16.0	16.0		16.0	4.7	2.9
2	16.0	16.0		16.0	4.9	3.1
3	16.0	16.0		16.0	4.9	3.1
4	16.0	16.0	S	16.0	4.3	3.1
5	16.0	16.0		16.0	4.3	3.1
6	16.0	16.0	U	16.0	3.7	3.1
7	16.0	16.0		16.0	3.5	2.9
8	16.0	16.0	R	16.0	3.5	2.9
9	16.0	16.0		16.0	3.5	3.1
10	16.0	16.0		16.0	3.3	3.1
11	16.0	16.0	P	16.0	3.3	2.9
12	16.0	16.0		16.0	3.3	3.1
13	16.0	16.0	L	16.0	2.7	3.1
14	16.0	16.0		16.0	3.3	3.1
15	16.0	16.0	U	16.0	2.9	3.1
16	16.0	16.0		14.2	2.9	2.9
17	16.0	16.0	S	13.8	3.3	2.9
18	16.0	16.0		12.0	3.3	3.1
19	16.0	16.0		10.3	3.1	2.9
20	16.0	16.0	16.0	8.9	3.1	3.1
21	16.0	16.0	16.0	7.6	3.1	2.9
22	16.0	16.0	16.0	8.1	3.1	2.9
23	16.0	16.0	16.0	7.9	3.1	3.1
24	16.0	16.0	16.0	7.9	2.9	3.1
25	16.0	16.0	16.0	7.9	2.4	3.1
26	16.0	16.0	16.0	7.9	2.0	3.1
27	16.0	16.0	16.0	7.9	2.0	2.9
28	16.0	16.0	16.0	7.1	2.5	2.9
29	16.0	16.0	16.0	6.4	2.9	2.9
30	16.0	16.0	16.0	6.1	3.3	3.1
31	—	SURPLUS	—	5.2	3.3	—
Total Sec. Ft. Days	480.0	480.0(a)	176.0(b)	379.2	102.4	90.6
Mean Sec. Ft.	16.0	16.0(a)	16.0(b)	12.2	3.3	3.0
Total Ac. Ft.	952	952 (a)	349 (b)	752	203	180

(a) 30-day period
(b) 11-day period

TABLE 5

DISCHARGE OF SHASTA RIVER AT EDGEWOOD BRIDGE

October 1, 1952 to September 30, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
1	9.2	20	156	88	89	59	82	132	115	82	9.7	10.8
2	9.7	21	77	89	91	53	81	121	120	86	9.2	11.3
3	9.7	22	52	84	121	58	87	132	114	89	8.7	9.7
4	8.7	22	52	75	124	54	97	104	111	95	8.7	9.2
5	10.2	21	112	66	118	53	110	136	114	100	8.7	9.7
6	10.2	20	58	67	128	53	115	180	156	93	7.1	9.2
7	10.2	19.8	217	164	152	56	99	168	168	83	7.1	9.2
8	10.2	20	153	313	147	57	93	143	136	82	7.1	9.7
9	10.2	21	114	743	115	56	86	120	132	73	7.1	7.1
10	9.2	19.2	241	328	104	160	75	93	114	55	6.6	6.6
11	9.2	18.6	192	365	96	105	68	78	100	53	7.1	6.3
12	9.2	22	127	524	88	112	62	75	89	55	7.6	6.0
13	9.2	49	92	430	83	87	56	79	89	55	9.2	6.3
14	8.7	58	77	258	81	78	53	118	89	55	9.2	6.6
15	9.2	46	75	188	77	74	41	104	87	52	8.2	6.6
16	9.2	45	69	161	74	87	46	135	105	46	7.6	8.2
17	9.2	39	63	194	72	75	45	135	125	40	9.2	8.2
18	19.2	34	58	285	70	62	43	155	143	33	8.2	8.7
19	18.6	30	60	316	64	108	52	241	133	34	7.6	8.7
20	19.2	30	64	456	62	93	67	203	117	31	7.1	9.7
21	19.2	28	59	252	61	87	115	223	104	30	6.6	12.3
22	19.2	28	56	186	60	89	197	153	96	29	6.6	11.8
23	16.8	28	49	158	58	86	205	243	120	28	7.1	12.3
24	16.8	26	46	136	57	118	179	173	127	26	7.1	12.3
25	18.6	25	49	120	56	117	194	147	124	27	6.6	11.8
26	18.0	25	68	107	56	95	265	140	117	27	6.6	11.8
27	18.6	26	110	100	56	89	340	128	111	23	7.1	12.3
28	19.8	23	110	96	58	103	221	125	103	20	8.7	12.8
29	19.2	24	104	92		99	195	136	95	14.3	10.2	12.3
30	19.8	26	211	88		89	128	150	92	11.3	11.3	10.8
31	19.8	—	104	88		83		145	—	10.8	10.8	—
Mean	13.7	27.9	99.2	213.4	86.4	83.7	116.6	142.4	114.8	49.3	8.5	9.6
Total Ac. Ft.	841	1,659	6,098	13,122	4,795	5,146	6,935	8,755	6,833	3,031	495	572

Total for period - 58,282 acre-feet.

TABLE 7

DISCHARGE OF LITTLE SHASTA RIVER ABOVE HARP DITCH
April 1 to September 30, 1953

Mean Daily Discharge in Cubic Feet per Second

Day	April	May	June	July	August	September
1	38	49	92	38	12.8	9.3
2	41	45	92	37	12.4	9.0
3	46	47	85	33	13.3	9.0
4	49	56	81	33	12.8	9.0
5	50	62	80	32	12.8	8.7
6	46	63	101	30	12.4	8.7
7	38	59	103	29	12.0	8.7
8	35	56	89	28	12.0	8.6
9	31	51	86	26	11.2	8.4
10	28	48	81	25	11.6	7.5
11	27	51	78	24	10.5	7.5
12	25	53	81	23	10.5	7.7
13	27	53	77	22	10.5	7.7
14	26	58	73	22	11.2	7.5
15	26	53	72	21	10.5	7.8
16	26	54	72	20	10.5	7.8
17	27	53	70	19.4	10.2	7.5
18	27	67	69	18.9	9.6	7.5
19	30	168	68	18.4	9.3	7.2
20	41	97	63	17.9	9.9	7.5
21	53	103	59	17.4	10.2	7.8
22	67	92	56	15.9	10.2	7.8
23	67	142	55	15.9	10.2	7.8
24	62	136	53	15.9	10.2	7.8
25	64	115	51	15.9	9.9	7.5
26	78	116	49	14.9	10.2	7.5
27	101	111	46	14.5	9.9	7.5
28	82	140	44	14.1	9.6	7.5
29	68	111	44	13.7	10.8	7.5
30	54	106	41	13.3	10.2	7.5
31	—	100	—	12.8	9.9	—
Total Sec. Ft. Days	1,380	2,515	2,111	681.9	337.3	238.8
Mean Sec. Ft.	46.0	81.1	70.4	22.0	10.9	8.0
Total Ac. Ft.	2,737	4,987	4,186	1,352	668	474

Total for period - 14,404 acre-feet

TABLE 8

DISCHARGE OF CARRICK SPRINGS
April 1 to September 30, 1953

Intermittant Measurements of Discharge in Cubic Feet per Second

Day	April	May	June	July	August	September
1						
2						
3						
4						6.25
5			6.62			
6						
7						
8						
9						
10		6.31			6.30	
11						
12						
13				6.51		
14	6.61					6.25
15						
16						
17						
18						
19						
20						
21						
22					6.28	
23						
24						
25		6.55		6.40	6.30	
26						
27						
28						
29	6.66		6.35			
30						
31						

TABLE 9

DISCHARGE OF CLELAND SPRING
April 1 to September 30, 1953

Intermittant Measurements of Discharge in Cubic Feet per Second

Day	April	May	June	July	August	September
1						
2						
3						
4						
5						
6						
7						
8	10.7					
9						
10				10.1		10.6
11						
12						
13						
14					10.2	
15						
16		10.2				
17						
18						
19						
20			10.25			
21						
22						
23						
24	10.6					
25				10.1		
26						
27						
28						
29						
30					10.2	
31						

TABLE 10

DISCHARGE OF MONTAGUE WATER CONSERVATION DISTRICT PARKS CREEK CANAL

October 1, 1952 to September 20, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
1		1.1	3.0	9.2	0	0	7.7	24	2.2	20		
2	No	.9	11.0	8.2	0	0	8.4	18.0	2.1	19.8	No	No
3		.9	6.0	7.0	.2	0	12.2	18.0	2.1	19.3		
4	Flow	.8	7.0	6.6	1.5	0	17.6	28.8	2.1	20	Flow	Flow
5		.9	20	3.4	1.1	0	22	51	2.0	19.3		
6		1.1	21	.2	1.3	0	23	69	2.1	16.4		
7		1.5	41	1.7	1.8	0	19.8	62	1.5	14.2		
8		2.5	22	5.0	1.6	0	18.0	45	1.3	12.6		
9		3.8	18	74	1.0	0	14.6	32	1.3	4.5		
10		5.7	42	6.8	.2	1.0	12.2	24	1.2	1.3		
11		7.4	20	1.9	0	.4	9.5	18.0	1.3	1.2		
12	No	8.2	12	2.1	0	.5	7.9	16.0	1.3	1.2		
13		.4	8.9	1.8	0	.3	6.8	23	1.2	1.2		
14	Flow	1.1	7.4	1.1	0	.3	5.0	40	1.2	1.1		
15		2.3	6.8	1.0	0	.2	5.9	30	1.2	1.1		
16		2.7	6.2	1.0	0	.1	7.7	39	1.2	.8		
17	No	3.4	5.3	1.0	0	0	8.2	46	1.2	0		
18		3.3	5.0	3.0	0	0	7.4	54	1.1	0		
19	Flow	3.4	5.3	6.0	0	.3	10.6	93	1.0	0		
20		3.8	5.7	8.0	0	.5	16.0	69	.9	0		
21		4.0	5.7	3.3	0	.4	28	62	.8	0		
22	No	3.6	5.0	2.0	0	.4	60	44	.8	0		
23		3.4	4.1	1.3	0	.3	77	63	32	0		
24	Flow	3.1	4.1	1.1	0	.3	68	43	43	0		
25		3.0	4.1	.7	0	.2	74	36	39	0		
26		2.7	7.7	.2	0	.2	101	33	36	0		
27		2.7	17.6	.1	0	.1	104	28	33	0		
28		2.7	13.2	.1	0	11.9	66	30	29	0		
29	.4	2.9	23.9	.1		9.0	47	38	25	0		
30	1.2	3.5	24.9	.1		7.7	33	47	23	0		
31	1.6	—	9.7	.1		0.6	—	13.9	—	0		
Mean	0.1	28.9	127.0	5.1	.3	1.1	30.0	39.9	9.7	5.0		
Total Ac. Ft.	6.3	172	780	314	17.2	69	1782	2454	577	305	0	0

Total for period - 6,476 acre-feet.

TABLE 11

STORAGE IN DWINNELL RESERVOIR

October 1, 1952 to September 30, 1953

Daily Storage on Hand in Acre-Feet

Day	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.
1	11,380	10,520	11,240	17,840	24,350	24,800	25,640	27,530	30,050	29,090	21,670	14,210
2	11,350	10,500	11,540	17,940	24,300	24,810	25,710	27,470	30,140	28,900	21,350	14,060
3	11,310	10,480	11,680	18,070	24,570	24,830	25,790	27,390	30,110	28,640	21,040	13,890
4	11,260	10,470	11,800	18,260	24,720	24,840	25,880	27,380	30,110	28,530	20,760	13,750
5	11,220	10,460	11,970	18,360	24,870	24,860	26,000	27,380	30,130	28,320	20,540	13,590
6	11,180	10,450	12,050	18,430	25,020	24,870	26,100	27,440	30,200	28,160	20,280	13,430
7	11,140	10,450	12,728	18,670	25,110	24,890	26,210	27,530	30,240	27,860	20,020	13,290
8	11,090	10,450	13,290	19,070	25,260	24,900	26,300	27,600	30,140	27,670	19,760	13,130
9	11,040	10,450	13,540	20,150	25,320	24,980	26,370	27,660	30,030	27,410	19,500	13,020
10	11,000	10,460	13,970	21,390	25,320	25,140	26,420	27,630	29,910	27,160	19,330	12,900
11	10,970	10,470	14,560	21,930	25,310	25,470	26,460	27,590	29,870	26,840	19,140	12,800
12	10,940	10,470	14,900	22,740	25,250	25,590	26,480	27,500	29,840	26,550	18,980	12,730
13	10,916	10,480	15,090	23,240	25,320	25,500	26,490	27,440	29,880	26,370	18,790	12,670
14	10,880	10,600	15,220	23,310	25,290	25,370	26,490	27,380	29,910	26,010	18,620	12,610
15	10,860	10,650	15,320	23,180	25,200	25,230	26,480	27,380	29,930	25,750	18,400	12,530
16	10,800	10,700	15,420	23,040	25,130	25,080	26,450	27,440	29,950	25,460	18,150	12,450
17	10,760	10,740	15,510	23,040	25,070	25,040	26,420	27,510	29,960	25,200	17,970	12,360
18	10,750	10,770	15,590	23,110	24,990	25,010	26,390	27,540	30,030	24,740	17,690	12,230
19	10,730	10,800	15,640	23,490	24,870	24,930	26,340	27,620	30,060	24,620	17,370	12,180
20	10,710	10,820	15,760	23,810	24,780	24,980	26,310	27,890	30,060	24,440	17,070	12,100
21	10,690	10,840	15,860	23,900	24,770	24,890	26,250	28,130	30,060	24,080	16,810	12,030
22	10,680	10,860	15,920	23,940	24,740	24,930	26,270	28,260	30,030	23,820	16,610	11,960
23	10,650	10,880	15,960	23,910	24,720	24,980	26,450	28,900	29,960	23,570	16,350	11,870
24	10,640	10,900		23,870	24,680	25,050	26,570	29,010	29,930	23,330	16,010	11,790
25	10,630	10,910		23,870	24,690	25,220	26,640	29,090	29,930	23,120	15,760	11,720
26	10,610	10,930		23,820	24,700	25,140	26,850	29,270	29,870	23,000	15,340	11,640
27	10,700	10,940		23,870	24,720	25,070	27,050	29,410	29,780	22,720	15,140	11,550
28	10,590	10,950	16,780	23,970	24,740	25,190	27,350	29,540	29,640	22,510	14,980	11,460
29	10,570	10,960	16,950	24,080		25,320	27,480	29,650	29,540	22,270	14,740	11,410
30	10,550	10,970	17,410	24,180		25,440	27,570	29,780	29,300	22,020	14,540	11,330
31	10,540		17,670	24,270		25,520	———	29,930	———	21,810	14,360	———

TABLE 12

RELEASES FROM DWINNELL RESERVOIR

January 1 to September 30, 1953

Mean Daily Release in Cubic Feet Per Second

Day	January	February	March	April	May	June	July	August	September
1	0	0	0	0	67	2.0	92	34	57
2	0	0	0	0	58	33 (a)	93	77	54
3	0	0	0	0	46	77 (a)	97	76	47
4	0	0	0	0	42	45 (a)	99	77	46
5	0	0	0	0	41	45 (a)	100	80	47
6	0	12	0	0	59	88 (a)	104	81	47
7	0	30	0	0	58	184 (a)	99	84	47
8	0	36	0	0	51	259 (a)	101	84	42
9	0	42	0	0	47	229 (a)	102	68	39
10	0	49	0	0	41	139 (a)	109	48	34
11	0	49	0	0	42	85 (a)	108	48	21
12	78	48	45	0	47	36 (a)	108	48	13
13	240	49	90	0	49	0	110	48	17
14	236	48	89	0	49	0	111	48	16
15	195	48	89	0	49	5.0	111	49	14
16	62	48	69	0	51	5.0	111	55	17
17	62	48	29	0	53	5.0	108	59	21
18	62	48	52	0	55	11.1	106	81	21
19	118	48	73	12	51	20	85	87	22
20	254	33	73	37	51	24	84	87	22
21	125	18	47	46	47	26	82	91	22
22	126	18	22	58	46	27	79	92	22
23	125	18	22	59	25	38	71	92	22
24	191	7.0	22	61	3.6	38	70	88	22
25	66	0	53	66	2.0	45	61	86	22
26	49	0	84	72	2.0	47	52	86	22
27	0	0	42	71	2.0	53	58	81	22
28	0	0	0	70	2.0	61	60	63	24
29	0		0	70	2.0	70	60	56	21
30	0		0	68	2.0	86	68	59	17
31	0		0		2.0	—	41	57	—
Mean	64	25	29	23	37	60	88	70	29
Total Ac.Ft.	3944 (a)	1382 (a)	1787 (a)	1368	2266	3556	5433	4303	1705

Total for period - 25,744 acre-feet.

(a) Discharges through the siphon spillway computed by using the formula $Q = 0.6A\sqrt{2gh}$

TABLE 13

DISCHARGE OF BIG SPRINGS IRRIGATION DISTRICT PUMPING PLANT
April 1 to September 30, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	April	May	June	July	August	September
1	0	17.5	0	27.0	27.0	27.0
2	0	17.5	0	27.0	27.0	27.0
3	0	17.5	0	27.0	27.0	27.0
4	0	18.5	0	27.0	27.0	27.0
5	0	18.5	0	27.0	27.0	27.0
6	0	20.0	0	27.0	27.0	27.0
7	17.0	20.0	0	27.0	27.0	27.0
8	17.0	20.0	0	27.0	27.0	27.0
9	17.0	20.0	0	27.0	27.0	27.0
10	17.0	20.0	0	27.0	27.0	27.0
11	18.0	20.0	0	27.0	27.0	27.0
12	23.5	20.0	0	27.0	27.0	27.0
13	17.0	20.0	0	27.0	27.0	27.0
14	17.0	20.0	0	27.0	27.0	27.0
15	17.0	20.0	6.8	27.0	27.0	27.0
16	17.0	26.0	27.0	27.0	27.0	27.0
17	17.0	26.0	27.0	27.0	27.0	27.0
18	23.5	26.0	27.0	27.0	27.0	27.0
19	17.2	26.0	27.0	27.0	27.0	27.0
20	17.2	2.2	27.0	27.0	27.0	27.0
21	17.2	0	27.0	27.0	27.0	27.0
22	17.2	0	27.0	27.0	27.0	27.0
23	17.2	0	27.0	27.0	27.0	27.0
24	18.0	0	27.0	27.0	27.0	27.0
25	18.0	0	27.0	27.0	27.0	27.0
26	18.0	0	27.0	27.0	27.0	27.0
27	18.0	0	27.0	27.0	27.0	27.0
28	18.5	0	27.0	27.0	27.0	27.0
29	18.5	0	27.0	27.0	27.0	27.0
30	17.5	0	27.0	27.0	27.0	27.0
31	—	0	—	27.0	27.0	—
Total Sec. Ft. Days	430.5	395.7	411.8	837.0	837.0	810.0
Mean Sec. Ft.	14.4	12.8	13.7	27.0	27.0	27.0
Total Ac. Ft.	854	785	817	1660	1660	1606

Total for period—7,382 acre-feet.

TABLE 14

DISCHARGE OF GRENADA IRRIGATION DISTRICT PUMPING PLANT
April 1 to September 30, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	April	May	June	July	August	September
1	0	34	6	38	38	38
2	0	34	0	38	38	38
3	0	34	0	38	33	38
4	0	28	0	38	38	38
5	0	34	0	38	25	38
6	0	34	0	38	38	38
7	0	15	0	38	38	38
8	0	0	0	38	36	38
9	0	0	0	38	36	38
10	0	0	0	38	38	38
11	23	0	0	36	30	22
12	22	0	0	38	21	22
13	22	0	0	38	0	22
14	22	0	0	38	0	22
15	22	22	0	38	0	22
16	38	22	0	38	4	22
17	38	22	0	0	21	22
18	38	22	0	0	38	22
19	38	22	0	0	38	22
20	38	22	0	0	38	22
21	38	20	21	34	38	22
22	38	18	21	34	38	0
23	38	20	21	38	38	0
24	36	0	22	38	38	22
25	38	0	22	38	38	22
26	38	0	38	38	38	0
27	38	0	38	38	38	0
28	38	0	38	38	38	0
29	38	0	38	38	38	0
30	34	0	38	38	38	0
31	—	0	—	38	38	—
Total Sec. Ft. days	675	403	303	1016	966	666
Mean Sec. Ft.	22.5	13.0	10.1	32.8	31.2	22.2
Total Ac.Ft.	1338	799	601	2015	1916	1321

Total for period--7,990 acre-feet.

TABLE 15

DISCHARGE SHASTA RIVER WATER ASSOCIATION PUMPS
April 1 to September 30, 1953

Mean Daily Discharge in Cubic Feet Per Second

Day	April	May	June	July	August	September
1	9	42	0	42	42	42
2	13	42	0	42	42	42
3	13	42	0	42	42	42
4	13	42	25	42	42	42
5	13	42	37	42	42	42
6	28	42	17	42	42	42
7	42	42	0	42	42	42
8	42	42	0	42	42	42
9	42	42	0	42	42	42
10	42	42	0	42	42	42
11	42	42	0	42	42	42
12	42	42	0	42	42	42
13	42	42	0	42	42	42
14	42	42	0	42	42	42
15	42	42	20	42	42	42
16	42	42	42	42	42	42
17	42	38	42	42	42	42
18	42	29	42	42	42	42
19	42	29	42	42	42	42
20	42	20	42	42	42	42
21	27	0	42	42	42	42
22	13	0	42	42	42	42
23	8	0	42	42	42	42
24	0	0	42	42	42	42
25	0	0	42	42	42	42
26	0	0	42	42	42	37
27	36	0	42	42	42	29
28	42	0	42	42	42	29
29	42	0	42	42	42	16
30	42	0	42	42	42	13
31	—	0	—	42	42	—
Total Sec. Ft. Days	879	788	729	1302	1302	1174
Mean Sec. Ft.	29.3	25.4	24.3	42.0	42.0	39.1
Total Ac. Ft.	1,743	1,563	1,446	2,582	2,582	2,328

Total for period—12,244 acre-feet.