STATE OF CALIFORNIA

Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

November 1, 1935.

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California.

Attention: Mr. Gordon Zander
Supervising Hydraulic Engineer

Dear Sir:

Herewith is submitted a report covering the water distribution work in the newly created Big Valley Water Master District, Modoc and Lassen Counties, California, during the period from April 1st to September 30th in 1935.

Watermaster service in this area has been provided by the Division during each season since and including 1930 under provisions of certain temporary agreements between all water users pending the consumation of a permanent definition of the water rights. A final permanent agreement establishing the relative rights on Pit River in Big Valley was reached in October 1934; and thereunder the Big Valley Water Master District was created in accordance with Section 37f of the Water Commision Act.

This report considers the climatologic and hydrographic features of this season, together with a description of results. Reference is directed to the prior watermaster reports for the details of physical features of this area.

Respectfully submitted,

Associate Hydraulic Engineer.

ORGANIZATION

EARL LEE KELLY	DIRECTOR OF PUBLIC WORKS
EDWARD HYATT	STATE ENGINEER
HAROLD CONKLING	DEPUTY STATE ENGINEER

GORDON ZANDER

SUPERVISING HYDRAULIC ENGINEER

T. RUSSEL SIMPSON	SENIOR HYDRAULIC ENGINEER
IRVIN M. INGERSON	ASSOCIATE HYDRAULIC ENGINEER

GENERAL DESCRIPTION OF WORK

Period of Field Work During 1935.

Watermaster service in the Big Valley Watermaster District was commenced on about April 1st and was continued to about September 30th, in 1935.

Watermaster.

The work of water distribution in this area along Pit River in Big Valley was done mainly by Irvin M. Ingerson, as Deputy Water Master, in connection with similar work in the Hot Springs Valley, Pine Creek and South Fork Pit River Areas. T. Russel Simpson was Supervising Watermaster.

Regulation of Diversions.

The following main river diversion dams were continuously operated during the 1935 season: Lookout, Gerig, Bieber, Mc Arthur, and Avilla dams. The Fulcher dam was not essential for diversion through the Fulcher Pipe as long as the lower Gerig dam was operated during normally high flow conditions. The Merritt dam was in a state of disrepair.

Regulation of diversions was made in accordance with the established schedules of dam operation in the same manner as has been employed for many past years. This schedule of operation is provided for in the new permanent agreement entitled "Agreement Determining Rights to Water and to the Use Thereof from Pit River in Big Valley in Modoc and Lassen Counties, California" dated October 10, 1933. This agreement was duly recorded in each of the offices of the County Recorder of Modoc and Lassen Counties in December 1934.
Nov. 9.

Diversions were regulated both as to time and as to quantity to give the very best possible utilization of the available water to the benefit of each and all water users in the Watermaster District.

DISCUSSION OF RESULTS

PRECIPITATION DURING 1935.

The results of the snow surveys made annually by the Division at the three snow courses in the Upper Pit River Watershed is shown in TABLE 1, at the end of this report. That table is arranged to show this seasons record in comparison with the deduced normal (long time mean) and with the record average of the past six years.

TABLE 2, at the end of this report, gives a monthly and annual record of precipitation at Alturas, Jess Valley, and Bieber stations since 1929. At all stations the total seasonal precipitation for 1934-35 exceeded the total for any year since 1929. The frequency and occurrence of the precipitation during the spring season of 1935 was, in general, very beneficial to crop production.

WATER SUPPLY DURING 1935.

The water supply for irrigation from Pit River in Big Valley is mainly derived from the flow from Pit River itself above Big Valley and from the flow of Ash Creek reaching the river in the vicinity of the Gerig Dam. This latter source is immeasurable because the flow of Ash Creek at that point is wide spreading over the flat meadow lands and is effected by partial check dams to assist in that spreading. The flow of Pit River is continuously measured at the U.S.G.S. station below Canby, and again at a lower point where the river passes through Gouger Neck, seven miles upstream from the town of Lookout.

The flow in Pit River at Gouger Neck for the partial season of 1935 (July 1st to September 30th) is given in TABLE 4, at the end of this report. This record was obtained from daily gage height observations taken at Alturas by means of the automatic radio stream gage indicator installed at the standard stream gaging station at Gouger Neck.

Gouger Neck stream flow records were continuously taken by radio beginning about May 9th, but owing to the inability of making rating measurements of high flows the actual discharge could not be determined until about July 1st, as shown in TABLE 4.

A comparison of the seasonal total irrigation water supply entering Big Valley in Pit River during the past six years is shown in the following tabulation. The flow was measured at the Gouger Neck Station during 1930 and 1931 and at the Canby Station subsequently.

Season from April 1st to September 30th.	Total Flow in Acre Feet
1930	18,007
1931	1,784
1932	68,454
1933	9,580
1934	1,895
1935	77,083

Use of Water During 1935.

The total of all quantity allotments of Pit River water to Big Valley water users is 158.70 cubic feet per second as shown in the aforementioned agreement. Prior to about June 16th the flow in Pit River available for irrigation in Big Valley greatly exceeded the total allotments in 1935.

The water users were able to divert full irrigation heads at any or at all times during the earlier half of the season in 1935. Careful and diligent distribution of the supply was nevertheless necessary to give full utilization of the water.

A small increase in supply occurred early in July due to drainage water released from the upstream Hot Springs Valley Area. This water was used to irrigate portions of meadow lands in Big Valley that were not cut for hay but were used for pasture.

Early in August the water supply in Pit River diminished to a flow barely sufficient to maintain river water levels above dams and diversions were closed pending the possibility of additional drainage water from upstream irrigation.

Beginning at about the end of August the flow in Pit River above Big Valley was augmented by drainage water resulting from the one irrigation of Hot Springs Valley with water released from Big Sage Reservoir. This flow was used successively for stockwatering requirements. First, water was retained above Lookout dam to allow diversions in the Oilar Ditch and through the Three Corners diversion; then the channel storage above Lookout dam was dropped onto the Gerig dam to give diversions through the Fulcher pipe for stock water to the west side ranches; and finally the channel storage was dropped onto the Bieber dam to give diversions to the lower west side ranches. The additional water supply was not sufficient for further diversion for any other purposes. It required practically the entire month of September to distribute the above scheduled stockwater.

Crops.

TABLE 5, at the end of this report, gives a tabulation of crop production returns for the 1935 season, as submitted by the water users and represents their own measurements. The following tabulation gives a comparison of crop production in Big Valley during the past six years.

	Pit River in Big Valley Hay Crop Yields - in Tons per Acre					
CROP	1930	1931	1932	1933	1934	1935
ALFALFA HAY	1.8	1.0	1.6	1.4	0.7	2.92
MEADOW HAY	1.1	0.6	1.0	0.8	0.5	1.03
WATER SUPPLY	NORMAL	1/2 NORMAL	NEARLY NORMAL	1/2 NORMAL	1/10 NORMAL	OVER NORMAL

RECOMMENDATIONS.

The diversion structure at the head of the Three-Corner Slough is in a bad state of disrepair and either a new structure or some repair to the present dilapidated one is essential to any regulation of Lookout dam henceforth.

FINANCIAL STATEMENT.

One half of the seasons total cost of $900.00 for water master service in the Big Valley Water Master District in 1935 was paid by the water users, who were assessed in accordance with the provisions of Section 37f of the Water Commission Act. The State contributes an amount equal to the water users portion and the combined fund, placed with the State Treasurer, is drawn upon by the Division of Water Resources to defray the costs of the water master service.

TABLES.

TABLE 3

DAILY DISCHARGE IN CUBIC FEET PER SECOND
OF PIT RIVER NEAR CANBY (U.S.G.S.)
FOR THE SEASON APRIL 1st TO SEPTEMBER 30th, 1935.

Day	April	May	June	July	August	September	Remarks
1	316	341	270	60	15	16	
2	290	398	315	75	12	16	
3	299	454	361	111	11	17	
4	303	490	400	101	10	19	
5	344	508	391	85	11	20	
6	334	515	357	92	10	16	
7	465	515	353	95	9	15	
8	1140	454	374	92	8	15	
9	1800	408	340	101	6	14	
10	1680m	299	336	104	4.6	13	
11	1210	295	340	95	3.9	11	
12	970	318	357	82	2.5	10	
13	868	299	336	95	1.4	8.5	
14	805	318	306	80	1.0	7.5	
15	756	269	282	72	.6	6	
16	714	277	266	53	.2	5	
17	707	236	231	42	.2	46	
18	714	248	282	37	.1	4.3	
19	680	252	266	34	.1	4.3	
20	646	273	247	38	.1	4.3	
21	612	336	177	30	.1	4.3	
22	619	290	170	25	3.5	3.9	
23	619	204	131	21	7.5	3.9	
24	592	186	152	19	4.3	3.9	
25	515	132	128	17	4.6	3.6	
26	425	113	85	17	5.5	3.6	
27	376	130	60	17	5.	3.6	
28	322	154	53	18	5.	3.6	
29	304	261	53	18	7.5	3.6	
30	313	240	47	17	11	3.2	
31	—	250	—	17	16	—	
Total Sec. Foot Days	19738	9457	7466	1760	176.7	263.7	Period 6 mo.
Mean Sec Ft.	658	305	249	56.8	5.70	8.79	212.4
Max. Sec. Ft.	1800	515	400	111	16	20	1800
Min. Sec. Ft.	290	113	47	17	0.1	3.2	0.1
Total Ac. Ft.	39150	18760	14810	3490	350	523	77083

TABLE 4

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PIT RIVER AT GOUGER NECK
PERIOD JULY 1ST TO SEPTEMBER 30th, 1955.

DAY	JULY	AUGUST	SEPTEMBER		REMARKS
1	54	21	9.5		
2	54	21	9.5		
3	58	18	12		
4	67	18	15		
5	67	15	17		
6	67	15	27		
7	63	12	31		
8	63	12	34		
9	67	9.5	2.7		
10	77	9.5	20		
11	92	7.0	15		
12	87	5.0	12		
13	77	5.0	9.5		
14	73	3.5	9.5		
15	73	3.5	7.0		
16	68	2.0	7.0		
17	54	2.0	5.0		
18	46	2.0	5.0		
19	42	2.0	5.0		
20	38	2.0	5.0		
21	34	2.0	3.5		
22	34	2.0	3.5		
23	31	2.0	3.5		
24	31	5.0	3.5		
25	31	5.0	3.5		
26	27	7.0	3.5		
27	27	7.0	3.5		
28	27	9.5	2.0		
29	24	9.5	2.0		
30	24	9.5	2.0		
31	24	9.5	—		
Total Sec.Ft. Days	1601.0	253.0	312.5		92 Day Period.
Mean Sec.Ft.	51.65	8.16	10.08		23.5
Max. Sec.Ft.	92	21	34.		92
Min. Sec.Ft.	24	2.0	2.0		2.0
Total Ac. Ft.	3175	502	620		4297

TABLE 5

CROP PRODUCTION ON PIT RIVER
IN BIG VALLEY - 1935

	CROP	ACRES	YIELD Total Tons	YIELD Tons per Acre
Lydia N. Joiner	Alf.	20	50	2.50
D. J. Metzger	M. Hay	1000	Past. - 900 head Stock	
L. W. Kramer	Alf.	100	400	4.00
	M. Hay	240	210	0.88
James H. Hell	Alf.	40	95	2.37
	M. Hay	200	200	1.00
Peter Gerig	M. Hay	300	500	1.67
	Past.	400	250 head stock	
Frank Iverson	M. Hay	176	100	0.57
			including Pasture - 60 head stock.	

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DEPARTMENT OF PUBLIC WORKS

REPORTS OF THE

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer

REPORT ON WATER MASTER SERVICE ON PIT RIVER IN BIG VALLEY MODOC AND LASSEN COUNTIES DURING SEASON OF 1934

by

IRVIN M. INGERSON,

Associate Hydraulic Engineer

Sacramento, California

February 1935

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