STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

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EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

EDWARD HYATT, State Engineer

REPORT ON WATERMASTER SERVICE IN

BIG VALLEY WATERMASTER SERVICE AREA
MODOC AND LASSEN COUNTIES, CALIFORNIA

1943 SEASON

Sacramento, California

EARL WARREN
GOVERNOR OF CALIFORNIA

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

C. H. PURCELL
DIRECTOR

STATE OF CALIFORNIA
Department of Public Works
SACRAMENTO 5

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

December 22, 1945

Gordon Zander
Supervising Hydraulic Engineer
Sacramento, California

Attention: Harrison Smitherum, Senior Hydraulic Engineer

Dear Sir:

Herewith is submitted the annual report covering watermaster service within the Big Valley Watermaster Service Area, Modoc and Lassen Counties, California, for the 1943 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,

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Watermaster

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PLATE

Hydrograph of Pit River near Camby April 1 to September 30, 1943.

INTRODUCTION

The Big Valley Watermaster District, changed to Watermaster Service Area by the legislature in 1943, located in Modoc and Lassen Counties, California was created by order of the Division of Water Resources, entered November 13, 1934. As created, the District embraced all of the water rights on the Pit River in Big Valley as ascertained and determined by an agreement in writing 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, and duly recorded in ach of the offices of the County Recorders of Modoc and Lassen Counties in December 1934.

Watermaster service in the Big Valley Watermaster Service Area was carried on throughout the 1943 season in accordance with the "Distribution of Water" procedure contained in Sections 4000 to 4360, inclusive of the Water Code. Such service extended over the period from April 1 to September 30. G. M. Vickroy, Deputy Watermaster, administered the distribution of water during the entire period. Harrison Smitherum was the supervising watermaster.

WATER SUPPLY

Precipitation

The monthly, seasonal and average amounts of precipitation covering the period 1929 to 1943 as recorded at four stations in the general area of the Upper Pit River Basin are presented in Table 1. These data indicate that the precipitation for the seasonal year 1942-1943 was approximately 130 per cent of the fourteen year mean. Precipitation during the month of January was 178 per cent of the fourteen

year mean for the month.

The results of the annual snow surveys on courses located on Eagle Peak, Cedar Pass, Adin Mountain and Blue Lake ranch are shown in Table 2. The tabulation presents the record of the water content of the snow on about April 1 of each year for the period 1930 to 1943, inclusive for the first three courses and for the period 1940 to 1943, inclusive, for the Blue Lake ranch course. On April 1, 1943 the water content of the snow for the first three courses averaged 140 per cent of the mean for the period of record.

Stream Flow

The record of the daily discharges of the Pit River at the U. S. Geological Survey gaging station near Canby.for the year ending September 30, 1943 is presented in Table 3. A hydrograph prepared from these data for the period April 1 to September 30 is shown on Plate 1. During the watermaster service season, the discharges at this station are taken as the amounts available for distribution in Big Valley. At the beginning of the season, however, additional water is available from small tributaries whole confluence with the Pit River are downstream from Canby and above Lookout Dam. The monthly and total runoff for each irrigation season from 1932 to 1943 at the above mentioned station is presented in the following table:

RUNOFF IN ACRE-FEET

Year	Apr.	May	June	July	Aug.	Sept.	Total
1932	17,100	37,500	9,520	3,170	480	684	68,454
1933	2,420	4,780	803	1,010	151	412	9,576
1934	77	427	934	427	13	16	1,894
1935	39,150	18,760	14,810	3,490	350	525	77,083
1936	30,120	13,170	5,770	1,410	864	1,710	53,044
1937	20,630	2,560	1,990	1,280	582	1,860	28,902
1938	112,100	72,160	19,760	3,680	1,310	3,210	212,220
1939	5,300	2,440	1,750	1,320	710	1,200	12,720
1940	23,200	5,370	3,080	1,090	2,450	2,190	37,380
1941	7,790	14,660	9,340	4,150	2,310	4,210	42,460
1942	29,930	34,100	21,010	4,670	1,710	3,750	95,170
1943	42,500	31,360	19,620	4,420	3,380	5,190	106,470

DISTRIBUTION OF WATER

Distribution for the 1943 season was made in accordance with both the provisions of the agreement and the sections of the Water Code heretofore mentioned. The practices initiated during the past seasons were followed with little or no modification. The usual procedure is to simultaneously irrigate as many ranches as the available water will cover. As the flow decreases and rotation becomes necessary the available water is passed successively downstream from dam to dam until each user receives his share.

Due to the large discharges during the months of April and May and the first part of June the main dams in the Pit River were not installed until after June 17. The water supply was sufficient to meet all requirements

until about July 1, with little or no regulation of diversions being required. Haying operations were generally in progress throughout the month of July and the demand for water was less than the supply until about July 22. Subsequent to that date and throughout the month of August the river discharge was barely sufficient to maintain storage behind the dams and to provide stockwater in the various sloughs. It was not possible to deliver stockwater to the Kate Gerig and Ernest Babcock ranches during certain periods of low water.

Water was available for irrigation after about August 30 from the return flow from Big Sage Reservoir release.

The details of operation for the 1943 season follow:

Lookout Dam

In view of the large stream flows Lookout Dam was not installed until the middle of June. It was not necessary to make any regulations at the dam prior to the beginning of haying. For a period of about one month, from the end of haying until the beginning of the release of the Big Sage Reservoir water , only stockwater was available. Subsequently, a small amount of irrigation was done on the John Harman and Will Gerig ranches.

Gerig Dam

Ther Gerig Dam was installed about June 17, a few days after the installation of the Lookout Dam. There was sufficient water to meet all requirements for irrigation until the start of the haying operation. During the first two weeks of August there was only sufficient water for stock. About September 15, water was turned through the Fulcher pipe for Kramer, Holl and other west side users and through the Gerig pipes for Peter Gerig. This was return water from irrigation in Hot Springs Valley together with water released from Roberts Reservoir. Arad Babcock and Lester A. Babcock also received water from Roberts Reservoir through the Watson Ditch.

Bieber Dam

The main dams on the Bieber Dam System, namely Bieber, Ricketts and Caldwell Road dams, were installed during the first part of June. All users under this system received all the water required for irrigation until the beginning of haying. During this period, little or no regulation of the diversions was necessary except for the watermaster to make certain that the allotments to the Upper and Lower Thompson Dams, at the end of the Bieber Dam System, were satisfied.

All users under the Bieber Dam System received an irrigation from return flow or from water purchased from the Hot Spring Valley Irrigation during the first part of September.

McArthur Dams

The McArthur dam on the Pit River and the Goble Slough dam were installed about June 17. Sufficient water was available to the McArthur Ranch to provide all irrigation water required until haying. One irrigation was obtained in the early part of September from return irrigation water in Hot Spring Valley.

Avilla Dam

The Avilla Dams have not been repaired and consequently were not used during the 1943 season. Some water was available to the Avilla Ranch for irrigation purposes from the return flow from the McArthur Ranch.

Big Sage Reservoir Water

Water purchased from the Hot Spring Valley Irrigation District by the Big Valley Water Users Association was released from the Big Sage Reservoir between August 5 and September 18. The total amount of water purchased was 300 acre-feet and was contracted for by the members of the Big Valley Water Users Association as follows:

John Hartman, Merlin Kennedy, Kate Gerig, T. Walters (De Mange), Frank Iverson (Brown), E. Babcock and J. Thompson.

All of the above named persons are under the Bieber Dam System with the exception of John Hartman who receives water diverted by Lookout Dam.

About 6,200 acre-feet of water passed the Canby station from August 5 and September 18 in addition to the 300 acre-feet of purchased water. The natural flow water was distributed according to the allotments of the individual users and the purchased water was delivered to the parties who had contracted for it.

SUMMARY

Due to a better than normal snow pack in the mountains and heavy precipitation during the month of April a minimum ofirrigation and regulation of diversions was necessary before the beginning of haying. During the first two weeks of August there was only sufficient water for stock-watering purposes. After this time, the Hot Spring Valley water release increased the stream flow by a sufficient amount to permit a late season irrigation.

In general, the crops produced in Big Valley during the 1943 season were of average yield.

CONTROVERSIES

No serious controversies occurred during the 1943 season.

TABLE 1

PRECIPITATION-UPPER PIT RIVER STATIONS-1929 TO 1943
MONTHLY, SEASONAL AND AVERAGE AMOUNTS IN INCHES

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Season
Jess Valley, Modoc County, California, Elev. 5,400 ft.													
1940-1941	1.95	2.31	1.62	1.28	3.02	0.48	0.77	2.89	2.39	0.20	1.90	1.13	19.94
1941-1942	1.48	1.71	3.10	1.66	1.57	0.94	2.34	3.44	1.02	0	0.24	0.15	17.65
1942-1943	0.33	2.60	3.25	3.00	2.69	1.76	2.68	1.31	1.76	0.71	0	0	20.09
14 Yr. Total	15.57	19.99	27.45	29.17	28.22	24.71	26.16	22.58	14.08	5.70	3.18	9.92	226.73
14 Yr. Mean	1.11	1.43	1.96	2.08	2.02	1.77	1.87	1.61	1.01	0.41	0.23	0.71	16.20
Alturas, Modoc County, California, Elev. 4,460 ft.													
1940-1941	2.00	1.05	2.73	1.35	2.13	0.68	0.51	1.59	0.86	0.02	1.16	0.50	14.58
1941-1942	1.40	1.83	2.98	2.16	1.84	0.59	1.37	1.71	0.94	0	0.56	0.20	15.58
1942-1943	0.35	2.51	1.97	3.68	1.81	1.39	1.72	0.70	0.29	0.27	0	0.03	14.72
14.Yr. Total	14.29	16.22	25.69	28.69	22.24	17.46	14.69	12.60	7.41	2.82	2.89	5.33	170.33
14 Yr. Mean	1.02	1.16	1.84	2.05	1.59	1.25	1.05	0.90	0.53	0.20	0.21	0.38	12.17
Lakeview, Lake County, Oregon, Elev. 4,759 ft.													
1940-1941	2.11	2.18	1.62	2.40	2.91	0.86	1.45	2.62	2.14	T	1.82	0.83	20.94
1941-1942	1.60	1.33	3.34	2.40	2.59	0.46	1.76	2.46	0.65	T	0.18	0.63	17.40
1942-1943	0.79	2.70	3.56	3.39	1.37	1.38	2.16	1.42	1.29	0.13	0	0	18.19
14 Yr. Total	15.13	16.68	27.22	25.71	25.51	19.96	18.78	16.56	11.54	2.02	2.87	7.35	189.33
14 Yr. Rec. Mean	1.08	1.19	1.94	1.84	1.82	1.43	1.34	1.18	0.82	0.14	0.21	0.52	13.52
Bieber, Lassen County, California, Elev. 4,200 ft.													
1940-1941	3.15	2.66	3.45	1.90	4.52	0.44	0.57	2.33	1.25	0.18	0.30	0.41	21.16
1941-1942	0.60	1.75	4.28	2.35	3.79	1.13	2.75	1.87	0.97	0	0.35	0.08	19.92
1942-1943	0.73	3.39	3.19	5.44	2.28	2.07	2.22	0.63	1.97	0.09	0	T	22.01
14 Yr. Total	19.20	20.49	39.11	37.83	38.88	27.98	19.73	17.95	8.06	2.30	0.99	6.31	238.83
14 Yr. Rec. Mean	1.37	1.46	2.79	2.70	2.78	2.00	1.41	1.28	0.58	0.16	0.07	0.45	17.05

For records prior to 1940-1941, see 1940 Report.

TABLE 2
SNOW SURVEY DATA—UPPER PIT RIVER

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Eagle Peak Course Elev. 7500 Ft. Date of Survey	4/3	4/1	3/30	3/30	4/2	4/10	4/9	3/29	3/31	3/30	4/4	3/26	3/29	3/24			
Depth of Snow—Inches	24.3	13.3	43.8	38.1	9.9	66.1	50.5	47.3	71.3	27.2	38.4	35.1	38.6	56.7			
Water Content—Inches	11.0	5.2	18.7	14.3	3.3	22.6	22.1	17.5	23.6	10.4	15.6	13.8	14.7	23.7			
Density—Percent	45.3	39.1	42.6	37.5	33.3	34.2	43.7	37.1	33.1	38.2	40.6	39.3	38.1	41.8			
Record Average—Inches								14.32	15.35	14.8	14.9	14.8	14.8	15.5			
% of Record Aver.	78.0	36.3	131.0	100.0	23.0	158.0	154.0	122.0	153.7	70.5	104.7	93.3	99.3	152.9			
Cedar Pass Course Elev. 7200 Ft. Date of Survey	3/31	3/30	3/26	3/28	3/31	3/27	4/5	4/10	3/26	3/28	3/22	3/24	3/27	3/22			
Depth of Snow Inches	29.3	22.1	49.2	43.9	2.2	56.4	68.2	54.4	79.1	28.2	35.9	40.8	47.4	62.3			
Water Content Inches	13.3	8.3	19.8	16.3	0.9	21.1	26.2	21.6	25.2	10.5	14.6	17.9	19.3	25.8			
Density—Percent	44.4	37.6	40.3	37.1	40.8	37.4	38.4	39.6	31.8	37.2	40.7	43.8	40.7	41.4			
Record Average—Inches								15.9	16.9	16.3	16.1	16.3	16.0	17.2			
% of Record Average	82.0	50.4	118.0	102.5	5.7	133.0	165.0	136.0	149.1	64.4	90.7	109.0	120.6	150.00			

TABLE 2 (Continued)

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Blue Lake Ranch Course Elev. 7300 Ft.			New	Course	1940												
Date of Survey											4/11	3/28	3/31	5/26			
Depth of Snow-Inches											16.3	18.8	28.9	34.9			
Water Content-Inches											6.4	8.5	11.7	15.5			
Density—Percent											39.2	45.2	40.5	45.8			
Record Average-Inches																	
% of Record Average																	
Adin Mountain Course—Elev. 6500 Ft.																	
Date of Survey	3/27	3/27	3/24	3/27	4/1	4/17	3/26	4/7	4/8	3/31	4/7	3/31	4/2	5/21			
Depth of Snow-In.	13.3	6.1	30.0	37.6	0	45.9	47.2	37.4	61.4	17.5	10.8	24.6	32.1	30.4			
Water Content-In.	6.1	2.9	13.3	14.1	0	18.8	20.0	16.7	28.1	8.1	4.3	11.3	13.9	15.2			
Density—Percent	45.6	47.3	44.3	37.5	0	40.9	42.4	44.8	45.8	46.2	39.8	45.9	43.3	45.4			
Record Average-In.								11.5	13.3	12.8	12.0	12.0	12.1	12.2			
% of Record Aver.	53.0	25.2	115.6	122.5	0	163.7	174.0	145.2	211.3	63.3	35.8	94.1	114.9	103.2			

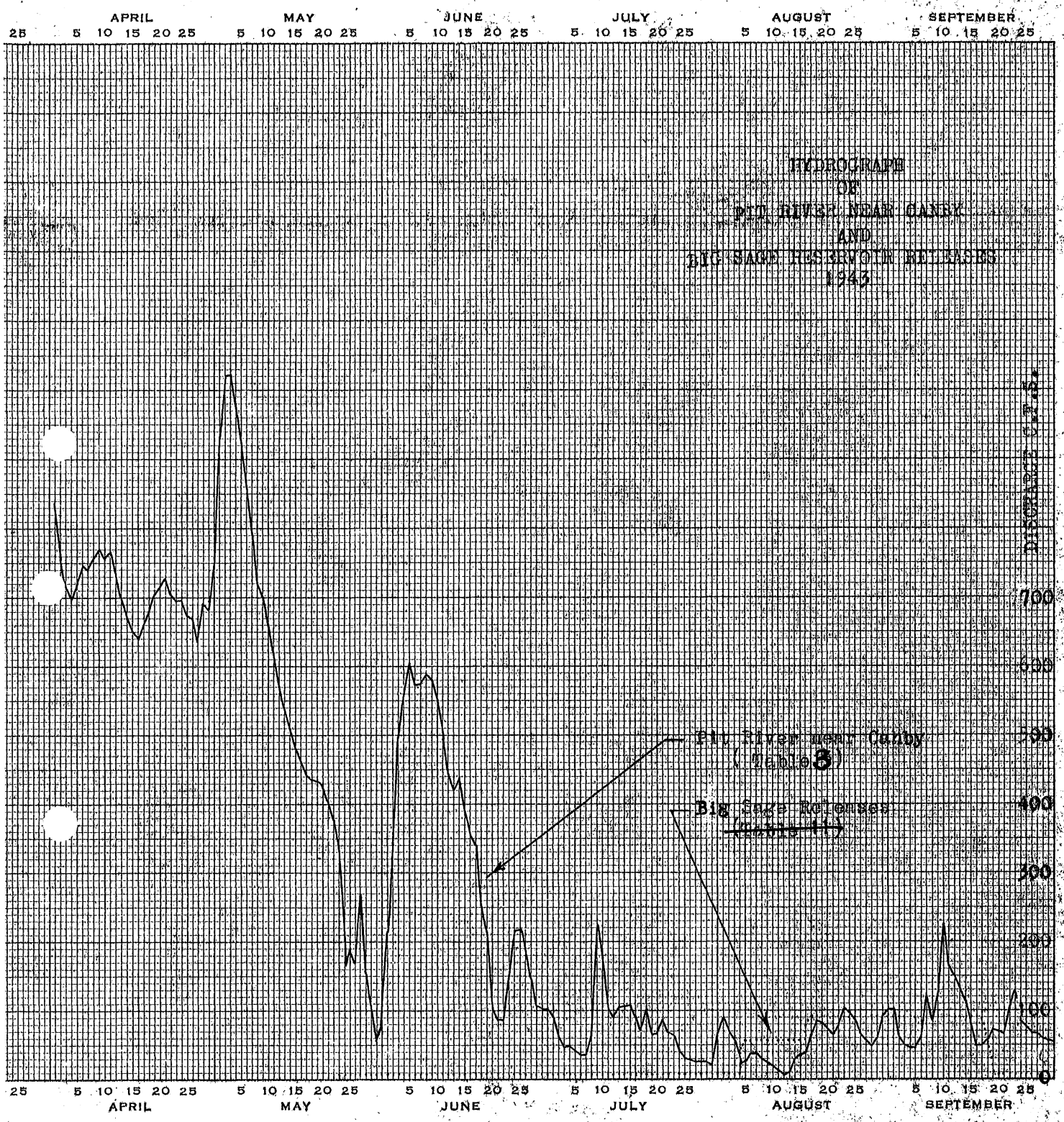
TABLE 13

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PIT RIVER NEAR CANBY
For Year Ending September 30, 1943

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29.0	29	151	758	360	1300	836	932	214	95	90	101
2	27	22	162	686	305	1190	758	1020	340	62	69	62
3	32	21	151	504	300	1130	716	1020	499	47	56	51
4	24	21	144	355	305	1140	698	980	554	49	22	45
5	17	42	132	260	345	1230	722	914	604	42	25	44
6	38	69	113	205	375	1360	746	854	576	37	37	60
7	33	98	98	151	428	1580	740	788	576	38	38	122
8	21	98	95	140	444	1930	758	728	587	65	30	85
9	32	119	98	155	428	2370	770	790	582	223	26	129
10	33	107	101	162	375	2640	758	660	548	184	20	223
11	32	87	107	158	355	2670	764	620	494	101	12	166
12	30	95	110	155	310	2370	734	570	444	92	9.5	151
13	27	90	113	144	300	2240	698	540	422	104	11	136
14	27	104	116	119	330	2130	668	510	438	104	29	116
15	27	116	129	116	365	1960	650	480	385	107	35	82
16	18	98	136	113	395	1820	644	460	355	92	37	49
17	15	110	129	105	543	1600	662	440	340	72	65	49
18	12	125	116	100	758	1340	680	433	250	101	85	58
19	12	144	110	101	932	1170	704	433	210	67	82	62
20	33	184	101	85	1010	980	716	428	101	67	74	60
21	87	151	92	1020	1140	818	728	406	85	85	65	65
22	44	125	95	2820	1840	710	728	375	85	99	79	104
23	21	110	101	1740	2300	626	704	335	144	62	101	129
24	15	110	132	1550	2130	576	698	166	214	40	98	85
25	10	110	192	1230	1970	532	698	188	218	30	85	79
26	7.5	113	265	1320	1790	538	674	171	179	30	65	67
27	6.5	113	310	1030	1630	576	638	270	144	25	56	67
28	6	110	416	848	1470	626	692	155	104	26	49	60
29	89	116	538	656		746	686	98	101	25	60	56
30	132	132	728	538		866	758	60	101	20	92	54
31	60		812	450		878		78		67	101	
Total	997.0	2969	6093	17774	23233	41642	21426	15812	9894	2228	1703.5	2617
Mean	32.2	99.0	197	573	830	1343	714	510	930	71.9	55.0	87.2
Acre-Feet	1980	5890	12090	35250	46080	82600	42500	31360	19620	4420	3380	5190

Year Mean 401
Acre-Feet 290,400

PLATE 1


HYDROGRAPH
OF
PIT RIVER NEAR CANBY
AND
BIG SAGE RESERVOIR RELEASES
1943
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
25 5 10 15 20 25
DISCHARGE C.F.S.
700
600
500
400
300
200
100
0
Pit River near Canby
(Table 3)
Big Sage Releases
(Table 1)