STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

O

EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

A. D. EDMONSTON, State Engineer

REPORT ON WATERMASTER SERVICE

IN

SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA
Modoc and Lassen Counties, California

1949 SEASON

Sacramento, California
March, 1951

SUBMISSION TO, AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, L. C. Jopson, Supervising Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California hereby submit the within contained report entitled "Report on Watermaster Service in South Fork Pit River Watermaster Service Area, Modoc and Lassen Counties, California, 1949 Season".

/s/ L. C. JOPSON
Supervising Hydraulic Engineer

I, Gordon Zander, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby approve the within contained report entitled "Report on Watermaster Service in South Fork Pit River Watermaster Service Area, Modoc and Lassen Counties, California, 1949 Season".

/s/ GORDON ZANDER
Principal Hydraulic Engineer

I, A. D. Edmonston, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, hereby approve and adopt the within contained report entitled "Report on Watermaster Service in South Fork Pit River Watermaster Service Area, Modoc and Lassen Counties, California, 1949 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 25th day of May, 1951 .

DEPARTMENT OF PUBLIC WORKS

By /s/ A. D. EDMONSTON
A. D. EDMONSTON
State Engineer

ORGANIZATION

C. H. Purcell . . . . . Director of Public Works

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

W. H. Van Etten . . . . . Assistant State Engineer

Gordon Zander . . . Principal Hydraulic Engineer

This report was prepared under the direction of

L. C. JOPSON
Supervising Hydraulic Engineer

By

J. VICTOR SCAMMON
Associate Hydrographer

T. R. Merryweather
Administrative Assistant

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REPORT ON
WATERMASTER SERVICE
IN
SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA
MODOC AND LASSEN COUNTIES, CALIFORNIA
1949 SEASON

INTRODUCTION

The South Fork Pit River Watermaster District, now Watermaster Service Area, Counties of Modoc and Lassen, California, was created by the order of the Division of Water Resources, entered December 31, 1934. As created the service area embraced the water rights determined by a decree entered October 30, 1934, by the Superior Court, Modoc County, in the case of W. E. Armstrong vs. Frank McArthur, et al. No. 3273, with the exception of certain rights defined in the paragraphs of said decree enumerated in said order. Subsequent thereto, orders changing said service area have been entered by the Division of Water Resources on December 31, 1936, whereby certain water rights on springs and spring channels near Likely, California, were excluded; on April 19, 1937, whereby the water rights of the South Fork Irrigation District were included in the watermaster service area; and on January 30, 1940, whereby the said service area was enlarged by incorporating therein the Pine Creek and Hot Springs Valley Watermaster Districts, theretofore created by orders entered by the Division of Water Resources on January 12, 1935.

Watermaster service in the South Fork Pit River Watermaster Service Area for the 1949 season covered the regulation of diversions from the South Fork of Pit River and its tributaries, Pit River and Rattlesnake Creek in Hot Springs Valley, and Pine Creek near Alturas; all included within

the scope of the service area as enlarged by said order of January 30, 1940. Watermaster service was carried on throughout the 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. J. Victor Scammon, Watermaster, South Fork Pit River Watermaster Service Area, administered the distribution of water from the various streams within the ~~district~~ service area during the period April 1 to September 30. Leslie C. Jopson was Supervising Watermaster.

WATER SUPPLY

small a

Precipitation

small a

The monthly, seasonal and average amounts of precipitation for stations in the Upper Pit River Area are given in Table 1. Each of the stations listed has a common 20 year record and comparisons are made using the 20 year averages. For precipitation data prior to 1940-41 reference is made to the watermaster report for the 1940 season, and for 1940-41 to 1944-45 reference is made to the watermaster report for the 1945 season.

small a

The results of the annual snow surveys made on the four courses in the Upper Pit River watershed are shown in Table 2 of this report. The table is arranged to show the water content of the snow at the beginning of the runoff period, April 1 to July 31, inclusive, as compared with the average water content over years of actual measurements. This information is used to forecast the probable April 1 - July 31 flow of the South Fork of Pit River above Likely and enables the watermaster to rough out a schedule of operation for the irrigation season. The forecast of the probable runoff is especially valuable in the operation of West Valley Reservoir.

Stream Flow

South Fork Pit River: The record of the daily discharge of the South Fork of Pit River above Likely is given in Table 3. These data were compiled from records of the United States Geological Survey. The station is below the junction of West Valley Creek and about four miles upstream from Likely. The irrigation use in Jess Valley and storage in West Valley Reservoir occur above the station. Water released from storage in the reservoir is included in the record.

A record of the daily releases in cubic feet per second from West Valley Reservoir during the irrigation season is given in Table 4.

The monthly full natural flow of the South Fork of Pit River above Likely for the irrigation season from April 1 to September 30 is shown in Table 5.

A comparison of the runoff in acre-feet of the South Fork of Pit River above Likely for the period from 1929 to 1949 is shown in Table 6.

The water content of the snow as measured at the Eagle Peak snow survey course on April 1 compared with the natural flow from April 1 to July 31 of South Fork of Pit River and Pine Creek is set forth in Table 7. The April 1 forecase of runoff made by the California Cooperative Snow Surveys for the South For, of Pit River above Likely was 50,000 acre-feet for the period April 1 to July 31, 1949, which indicated 125 per cent of normal. The measured flow for that period was 41,020 acre-feet.

The data presented in Tables 3 and 4 is shown graphically on Plate 1. The solid line represents the total discharge of the South Fork of Pit River and the dotted line the storage releases from West Valley Reservoir.

Fitzhugh Creek: A record of the available water supply of Fitzhugh Creek above the Clark Ranch is given in Table 8. The daily discharge data were computed from current meter measurements and a continuous record of the water stage throughout the entire season. This creek flows in a westerly direction entering the South Fork Valley at a point about 10 miles south of Alturas.

Pine Creek near Alturas: A record of the flow of Pine Creek near Alturas at the C.O.P.Co. Power House is given in Table 9. A continuous water stage recorder is maintained by the Division of Water Resources at a point above all irrigation diversions. A hydrograph of the flow of Pine Creek near Alturas has been prepared from the data in Table 9 and is presented on Plate 2.

The basic data for a comparison of the runoff in the Pine Creek Basin to the results of the annual snow surveys is given in Table 10. No forecast is made for this creek in the annual snow survey bulletins issued by the Division of Water Resources.

Pit River and Rattlesnake Creek in Hot Springs Valley and Big Sage Reservoir: The principal sources of water for irrigation in the Hot Springs Valley are the North and South Forks of Pit River, Big Sage Reservoir, and Rattlesnake Creek. Water from the latter source enters Pit River about four miles west of Alturas and is principally in the form of water stored in Big Sage Reservoir which is released down Rattlesnake Creek to meet irrigation demands.

Prior to 1940, the flow entering at the head of Hot Springs Valley was measured at the gauging Station on Pit River below the junction of the North and

South Forks. Channel improvements made on the North Fork of Pit River in the winter of 1939 now causes the water from that source to by-pass the station so that measurements there are of no value. Furthermore, due to backwater conditions from river dams it has not been feasible to establish a new measuring station below the new junction of the North Fork and South Fork of Pit River. Therefore, no record of the flow entering Hot Springs Valley from these sources is presented in this report.

A record of water released from storage in Big Sage Reservoir is given in Table 11. A comparison of the seasonal operations for the years 1934 to 1949, inclusive, is shown in Table 12.

Below Rattlesnake Creek there are other small streams tributary to Pit River in Hot Springs Valley which contribute to the water supply during the early part of each season. In 1949 the flow from these sources failed about June 15.

A stream flow measuring station is maintained by the U.S. Geological Survey on Pit River near Canby. This station is located at the outlet of Hot Springs Valley, and in the absence of other records, the flow at this station is indicative of water supply conditions in the Hot Springs Valley area. The record of this station, also covers the measurement of return flow from irrigation in the area. Table 13 is a record of the flow of Pit River near Canby, as taken from records compiled by the U. S. Geological Survey.

A hydrograph prepared from the data in Table 13 is presented on Plate 3. Superimposed thereon is a hydrograph of the flow released from Big Sage Reservoir.

DISTRIBUTION OF WATER

South Fork of Pit River

The regulation of diversions of the natural flow from the South Fork of Pit River, including Fitzhugh Creek and other upstream tributaries, was made in accordance with Schedules 2 and 3 of the South Fork of Pit River Judgment and Decree No. 3273, which set forth the several rights and priorities. The natural flow of West Valley Creek, less the amounts of the allotments of the Van Loan West Valley Ranch, was permitted to pass through the West Valley Reservoir without charge as regulated storage release.

The regulation of West Valley Reservoir storage was performed in accordance with the by-laws adopted by the South Fork Irrigation District. Water released from the reservoir flows down the natural channels and commingles with the natural runoff, but is separated again by the watermaster at the points of diversion of each member of the district requesting reservoir water. The amount of water to which each person was entitled was determined by multiplying the amount of the total storage at the beginning of the season by the percentage factor of each owner listed below:

Name	Per Cent
W. E. Armstrong (Now Arthur H. Burmister)	2.18
V. F. Christensen (Now Christensen Bros.)	20.46
A. T. Coffman (Now Kenneth Flournoy)	0.73
J. D. Flournoy (Now Arthur Flournoy)	3.98
W. H. Flournoy (Now Kenneth D. and Bernardine Van Loan)	2.51
R. O. Gaustad (Now Jacob F. Berner)	1.79
R. J. Gaustad (Now Peter and John McGarva)	1.95
Jesse Hughes (Now Maston Ramsey)	2.23
Frank McArthur (Now N.H. Monroe & Son ½; and Shuck Bros. ½)	45.62
Douglas McGarva	0.24
John and Peter McGarva	2.63
K. Nelson	2.74
Ray Stepp (Now Arthur H. Burmister)	1.07
A. L. Stinson (Now Arthur Flournoy)	0.03
D. E. Van Loan	8.53
Gary Williams	2.51
Roy Williams (Now Somer and Georgia Beeson)	0.80
	100.0

On June 17, West Valley Reservoir was opened for the first time of the 1949 season for the purpose of completing the irrigation of meadow hay lands. A small amount was withdrawn throughout the haying season for stock water and irrigation of upper pasture lands. Releases after haying for the irrigation of fall pasture, were made in the customary manner, with all users diverting their share of stored water as each user finished their haying operations.

The mean daily release for the 1949 season from West Valley Reservoir is given in Table 4.

Pine Creek near Alturas

Distribution of Pine Creek water was made in accordance with the allotments set forth in Schedule 2 of the Pine Creek Agreement. The irrigation season discharge for 1949 was 13,020 acre-feet. The April 1 - July 31 flow amounted to 11,670 acre-feet as compared with the 31 year mean of 7,920 acre-feet. For other comparisons see Table 10.

Water was stored in Dorris Reservoir after March 31, the agreement date, as the available water supply on Pine Creek was more than ample for other uses during the period from May 10 to June 2.

Hot Springs Valley

Distribution of Pit River water was made in accordance with the allotments set forth in Schedules 2 and 3 of the Hot Springs Valley Agreement. The distribution of Big Sage reservoir water was made in accordance with the by-laws of the Hot Springs Valley Irrigation District. As the major part of the water from both these sources is used by the same parties through the same irrigation systems and devices, the method of distribution is similar for both stored water and natural flow. The Godfrey Dam, the use which is regulated by agreement among parties affected by its operation, was not used in 1949.

Hot Spring Valley Irrigation District sold 70 acre-feet of stored water from Big Sage Reservoir to the Ralph Smith Lumber Company for their log pond at Canby.

The average percentages of allotments delivered from South Fork of Pit River, Fitzhugh Creek and Pine Creek are presented in the following tabulations:

SOUTH FORK PIT RIVER

Priority	Average percentages of allotments delivered					
	April	May	June	July	August	September
1st	100	100	100	100	90	100
2nd	85	100	82	20	5	4

FITZHUGH CREEK

Priority	Average percentages of allotments delivered					
	April	May	June	July	August	September
1st	100	100	100	100	100	100
2nd	100	100	100	95	7	10

PINE CREEK

Priority	Average percentages of allotments delivered					
	April	May	June	July	August	September
1st	100	100	100	75	60	48
2nd	40	100	80	3	0	0

CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS

The changes in ownerships of lands and water rights, which have occurred subsequent to filing "Statement for South Fork Pit River Watermaster Service Area, Counties of Modoc and Lassen, State of California, for 1949", and which have been included in the 1950 statement for said service area, are listed in the following tabulation:

Tract No.	Name of Water Right Owner Appearing in 1949 Statement	Name of Water Right Owner as Changed in 1950 Statement	Amount of Water c.f.s.
7-11	Blevins, Cecil	Walsh, Patrick H.	1.04
7-13	Blevins, Cecil	Weber, P. C.; Weber, Herman C. and Weber, John D.	.82
7-35	McArthur, Frank	(Monroe, N. H. and Son (Shuck Bros.	37.75 37.50
7-36	Bell, Herbert E., Jr.	Fitzhugh Creek Ranch Inc.	5.00
7-38	McArthur, Frank	Shuck Bros.	.25
7-27 (540 acres)	Van Loan, Dolph E. and Van Loan, Eva	Flournoy, Robert L. and Flournoy, Donald	7.01
7-27 (80 acres)	Van Loan, Dolph E. and Van Loan, Eva	Van Loan, Dolph E. and Van Loan, Eva	1.04
7-81	Geaney, Mike and Geaney, Jerry	Every, R. R. and Every, Dorothy	6.25
7-82	Kramer, Carrie E. and Craig, Robert	Albaugh, James I. and Albaugh, Orma K.	4.49
7-88	Hot Spring Valley Irrigation District and Anklin, Ray	Anklin, Ray	Stockwater
7-89	Hot Spring Valley Irrigation District and Mohr, Klaus	Mohr, Klaus	Stockwater

TABLE 1

PRECIPITATION - UPPER PIT RIVER STATIONS - 1946-1949
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. 5400 Ft.													
16 Yr. Total	19.36	23.59	28.62	33.22	34.48	28.53	29.42	27.47	21.49	6.00	3.22	11.22	266.62
1945-1946	1.36	3.25	2.29	1.44	1.28	2.53	0.59	1.32	0.98	0.79	0.20	0.41	16.44
1946-1947	1.61	1.10	1.77	0.67	0.45	1.56	0.93	3.08	2.13	0	0.05	0.27	13.62
1947-1948	1.71	1.88	1.63	0.61	1.12	2.30	2.31	2.36	3.83	0.25	0.30	0.90	19.20
1948-1949	1.18	1.28	2.89	1.36	1.90	1.37	0.85	5.37	0.71	T	0.52	0.30	17.73
20 Yr. Total	25.22	31.10	37.20	37.30	39.23	36.29	34.10	39.60	29.14	7.04	4.29	13.10	333.61
20 Yr. Rec. Mean	1.26	1.56	1.86	1.86	1.96	1.82	1.70	1.98	1.45	0.35	0.22	0.65	16.68
Alturas, Modoc County, California, Elev. 4,460 Ft.													
16 Yr. Total	16.16	19.39	26.61	30.19	25.30	19.60	17.17	16.69	11.84	3.47	2.94	5.79	195.15
1945-46	2.09	2.08	1.47	0.72	0.58	1.49	0.48	0.72	0.48	0.67	T	0.12	10.90
1946-47	0.83	1.67	1.08	0.31	0.88	0.83	0.69	1.20	1.08	0	0.47	0.26	9.30
1947-48	1.58	1.38	0.48	0.84	0.51	1.57	2.47	2.12	2.34	0.20	0	0.81	14.30
1948-49	0.88	0.88	2.28	0.63	1.60	1.30	0.31	4.48	0.49	0.09	0.34	0.09	13.37
20 Yr. Total	21.54	25.40	31.92	32.69	28.87	24.79	21.12	25.27	16.23	4.43	3.75	7.07	243.02
20 Yr. Rec. Mean	1.07	1.27	1.60	1.63	1.44	1.24	1.05	1.26	0.81	0.22	0.17	0.35	12.15
Lakeview, Lake County, Oregon, Elev. 4,750 Ft.													
16 Yr. Total	17.92	20.61	29.07	27.81	29.56	22.50	20.63	21.68	18.19	2.42	2.95	8.45	221.79
1945-46	1.19	1.60	1.81	1.19	0.90	1.27	0.21	0.32	0.38	0.42	T	0.25	9.54
1946-47	1.45	1.81	1.55	0.29	0.67	1.97	0.74	1.80	2.96	0	0.06	0.32	13.62
1947-48	2.39	1.17	0.49	1.88	0.93	1.86	1.88	1.24	2.81	0.26	0.01	0.91	15.83
1948-49	0.34	0.98	1.88	0.48	1.42	1.69	0.56	2.64	0.94	0.37	0.02	0.38	11.70
20 Yr. Total	23.29	26.17	34.80	31.65	33.48	29.29	24.02	27.68	25.28	3.47	3.04	10.31	272.48
20 Yr. Rec. Mean	11.64	1.31	1.74	1.58	1.67	1.46	1.20	1.38	1.26	0.17	0.15	0.51	13.62
Bieber, Lassen County, California, Elev. 4,200 Ft.													
16 Yr. Total	21.63	25.65	41.95	40.52	43.24	31.50	22.85	21.40	11.13	2.71	0.99	6.66	270.23
1945-46	2.43	2.97	2.93	1.80	2.32	1.70	1.27	0.82	0.27	0.50	0	0.22	17.23
1946-47	0.54	1.98	2.74	0.60	1.56	1.91	0.79	2.25	1.17	0	0.35	0.28	14.17
1947-48	3.52	1.22	0.69	2.68	0.86	4.16	4.03	2.71	2.27	0.42	0.16	0.75	23.47
1948-49	0.79	1.23	3.48	0.67	1.72	1.23	0.86	2.18	0.37	0	0.07	0.08	12.68
20 Yr. Total	28.91	33.05	51.79	46.27	49.70	40.50	29.80	29.36	15.21	3.63	1.57	7.99	337.78
20 Yr. Rec. Mean	1.44	1.63	2.59	2.31	2.48	2.02	1.49	1.47	0.76	0.18	0.08	0.40	16.89

For records prior to 1940-1941, see 1940 Report
For records prior to 1945-1946, see 1945 Report

TABLE 2

SNOW SURVEY DATA—UPPER PIT RIVER

	1945	1956	1947	1948	1949	1950
Eagle Peak Course Elev. 7500 Ft.						
Date of Survey	3/30	4/5	4/2	3/29	3/29	
Depth of Snow—Inches	63.5	53.3	22.2	42.9	54.2	
Water Content—Inches	22.2	21.2	6.4	14.4	19.1	
Density—Percent	35.0	39.8	28.8	33.6	35.2	
Record Average—Inches	15.8	16.1	15.5	15.5	15.7	
% of Record Aver.	140.5	131.7	41.0	92.9	121.7	
Cedar Pass Course Elev. 7200 Ft.						
Date of Survey	3/29	3/28	3/31	3/31	3/30	
Depth of Snow Inches	67.5	55.4	26.0	49.1	63.7	
Water Content Inches	22.4	22.9	10.3	15.7	22.0	
Density—Percent	33.2	41.3	39.6	31.9	34.5	
Record Average—Inches	17.2	17.5	17.1	17.1	17.3	
% of Record Average	130.2	130.8	60.0	91.8	127.2	

	1945	1946	1947	1948	1949	1950
Adin Mountain Course— Elev. 6500 Ft.						
Date of Survey	4/3	3/26	3/31	3/31	4/4	
Depth of Snow—In.	41.2	44.0	13.4	28.4	43.4	
Water Content—In.	15.8	16.2	4.4	9.9	16.9	
Density—Percent	38.4	37.0	32.8	34.9	39.0	
Record Average—In	12.2	12.5	12.0	11.9	12.2	
% of Record Aver.	129.5	129.6	36.6	83.2	138.5	
Blue Lake Ranch Course Elev. 7300 Ft.			New Course 1940			
Date of Survey	4/3	4/3	4/1	4/1	4/1	
Depth of Snow—Inches	44.0	44.9	17.5	27.3	46.1	
Water Content—Inches	15.8	16.2	5.3	10.1	16.7	
Density—Percent	35.9	36.1	30.4	37.0	36.2	
Record Average—Inches			11.0	10.9	11.2	
% of Record Average			48.0	92.7	149.1	

For records prior to 1945, see 1946 report.

TABLE 3

DAILY DISCHARGE IN CUBIC FEET PER SECOND
SOUTH FORK PIT RIVER NEAR LIKELY
For Year Ending September 30, 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	33	)	)	)	36	78	178	276	60	92	57
2	47	34	20	)	)	44	83	195	238	56	102	57
3	46	40	)	)	)	45	79	178	200	52	110	52
4	49	33	)	)	)	40	79	158	178	52	108	46
5	57	31	)	)	)	40	86	148	164	48	106	46
6	43	34	)	)	)	43	89	146	162	45	102	46
7	34	30	)	)	)	47	124	142	154	40	106	47
8	32	31	20	)	)	45	162	162	148	39	108	49
9	31	30	)	)	)	43	133	290	140	40	108	50
10	30	30	)	)	)	45	128	307	129	40	108	49
11	30	31	)	)	)	60	131	273	122	39	110	50
12	30	30	)	)	)	60	128	263	114	37	108	41
13	30	30	20	)	)	56	128	315	108	34	102	34
14	43	31	)	)	)	74	128	422	102	33	100	32
15	43	33	)	20	)	129	122	534	87	32	83	31
16	34	32	)	)	20	129	142	473	79	36	73	30
17	32	31	)	)	21	116	162	382	89	36	68	30
18	30	29	15	)	22	162	168	350	124	40	62	34
19	30	32	)	)	24	128	193	319	146	48	62	33
20	30	30	)	)	26	96	195	470	128	56	59	31
21	30	28	)	)	28	87	195	405	114	50	60	31
22	28	29	)	)	35	69	211	328	108	49	60	30
23	28	30	15	)	34	60	231	276	104	49	59	32
24	29	32	)	)	36	69	284	248	92	49	59	31
25	28	28	)	)	35	66	271	222	93	90	67	31
26	29	27	)	)	33	67	258	211	93	108	77	32
27	28	26	)	)	33	106	260	197	80	108	75	37
28	27	25	15	)	35	89	238	191	65	110	66	24
29	30	24	)	)		72	222	213	63	108	60	19
30	29	22	)	)		78	191	245	63	90	63	19
31	31		)	)		78		248		92	59	
Total	1,066	906	540	620	682	2,279	4,899	8,489	3,763	1,766	2,582	1,131
Mean	34.4	30.2	17.4	20	24.4	73.5	163	274	125	57.0	83.3	37.7
Acre-Feet	2,110	1,800	1,070	1,230	1,350	4,520	9,720	16,840	7,460	3,500	5,120	2,240

Mean - 78.7
Acre-feet - 56,960

TABLE 4

MEAN DAILY RELEASE IN CUBIC FEET PER SECOND
WEST VALLEY RESERVOIR

For Season Ending September 30, 1949

Day	April	May	June	July	August	September
1	Reservoir started spilling April 22	Spilling approximately 20.0 c.f.s.	Reservoir stopped spilling June 10	15.0	51	46
2				15.0	73	46
3				15.0	73	26
4				15.0	73	26
5				15.0	73	26
6				.0	73	26
7				4.0	73	26
8				4.0	73	26
9				4.0	73	26
10				4.0	73	26
11				4.0	73	26
12				4.0	73	17
13				4.0	73	17
14				4.0	73	17
15				12.0	53	17
16				12.0	53	17
17			* 15.0	12.0	53	17
18			34	12.0	53	17
19			34	22.0	53	17
20			34	12.0	53	17
21			34	12.0	50	17
22			36	12.0	50	17
23			40	12.0	50	17
24			40	12.0	50	17
25			40	68	50	17
26			40	68	56	17
27			36	68	56	17
28			20	68	56	** 17
29			20	51	46	
30			15.0	51	46	
31				51	46	
Total			404	662	1,874	615
Total Ac. Ft.			801	1,313	3,717	1,220

Total release for season - 7,050 acre-feet.
*Reservoir first opened - storage 17,700 acre-feet
**Reservoir last closed - storage 10,100 acre-feet

TAB 4A

WEST VALLEY RESERVOIR
SEASONAL OPERATION RECORD 1936 to 1949

Year	STORAGE ON HAND AS OF						Irrigation Release	Total * Storage Differential
	Date First Obs.	Acre-feet	Date First-Opened	Acre-Feet	Date Last Closed	Acre-Feet	Acre-Feet	Open and Close
1935	Work was started on construction of dam in August 1935 and was completed late in 1936							
1936								
1937	May	8,000				0	7,000	
1938	Spilling		Aug. 3		Sept. 9		7,950	
1939			May 7		Aug. 22		11,680	
1940	May 30	16,620	May 30	16,620	Sept. 18	3,820	11,780	- 12,800
1941	April 13	17,840	July 11	17,490	Sept. 10	10,700	7,050	- 6,790
1942	April 11	17,950	June 24	17,700	Sept. 18	8,050	9,490	- 9,650
1943	April 15	18,230	July 17	17,400	Nov. 23	7,510	9,500	- 9,890
1944	April 6	12,640	May 27	14,400	Sept. 29	6,700	10,200	- 8,100
1945	March 31	13,205	June 22	17,400	Sept. 25	7,980	8,360	- 9,420
1946	April 1	16,590	June 10	17,590	Oct. 9	7,470	10,000	- 10,120
1947	March 1	12,390	April 5	12,470	Oct. 13	3,710	9,370	- 8,760
1948	March 13	8,850	March 13	8,850	Nov. 1	10,330	5,560	+ 1,480
1949	April 1	16,000	June 17	17,700	Sept. 28	10,100	7,051	- 7,600

* Includes all losses and accretions.

TABLE 5

TOTAL SEASONAL IRRIGATION WATER SUPPLY IN ACRE-FEET
OF THE SOUTH FORK OF PIT RIVER AT U.S.G.S. STATION ABOVE LIKELY
APRIL 1 TO SEPTEMBER 30, 1949

	April	May	June	July	Aug.	Sept.	Total
U.S.G.S. Record #693	9,720	16,840	7,460	3,500	5,120	2,240	44,880
Operation West Valley Reservoir (Storage Differential)	+ 1,200	+ 680	- 880	- 1,400	-4,200	-1,300	-5,900
Consumption in Jess Valley	0	900	1,800	1,200	500	500	4,900
Full Natural Flow	10,920	18,420	8,300	3,300	1,420	1,440	43,880

41,020 acre-feet natural flow, April 1 to July 31

WEST VALLEY RESERVOIR

Reservoir started spilling April 22 and stopped spilling June 10.

No diversion was made through the intake ditch from the South Fork of Pit River into West Valley Reservoir during 1949.

No consideration is given to consumptive use above West Valley dam or diversion from Cedar Creek into Tule Lake Reservoir in the above table. Cedar Creek and Tule Lake Reservoir will not contribute to the flow of South Fork of Pit River as in previous years because construction of a large dam across Cedar Creek and Tule Lake outlet has raised the spillway level to such a height that water may never spill again from Cedar Creek into West Valley.

TABLE 6

COMPARISON OF RUNOFF IN ACRE-FEET DURING IRRIGATION SEASON
SOUTH FORK OF PIT RIVER ABOVE LIKELY
FROM 1929 TO 1949

Year	April	May	June	July	August	September	Seasonal Total
			Acre-Feet				
1929	3,930	7,480	4,180	1,160	664	714	18,128
1930	6,410	7,750	2,950	956	830	1,160	20,056
1931	2,200	1,580	721	474	638	626	6,239
1932	7,440	19,600	9,160	2,370	1,390	1,040	41,000
1933	3,370	5,260	4,290	898	910	857	15,585
1934	3,250	2,020	2,210	658	613	649	9,400
1935	8,020	17,920	9,790	2,050	1,470	966	40,216
1936	11,700	12,640	6,360	1,640	1,360	1,280	34,980
1937	2,840	8,380	4,500	3,000	5,830	920	25,470
1938	10,960	29,700	11,840	3,020	7,950	3,100	66,570
1939	5,600	5,790	4,630	3,410	5,570	855	25,855
1940	3,260	8,610	5,000	4,150	6,540	1,680	31,240
1941	4,100	13,630	6,220	3,520	6,990	1,660	36,140
1942	9,400	17,640	12,400	3,410	8,490	2,320	53,660
1943	16,210	16,400	11,960	4,650	9,400	3,110	61,730
1944	3,470	9,110	9,210	3,570	6,500	4,550	36,410
1945	5,110	20,870	15,310	3,470	7,970	3,910	56,660
1946	9,920	13,460	6,590	2,690	7,290	1,690	41,640
1947	4,550	5,400	4,110	2,600	5,680	1,350	23,690
1948	3,140	8,850	15,530	3,450	5,380	2,570	38,920
1949	9,720	16,840	7,460	3,500	5,120	2,240	44,880

Above data taken from the U.S.G.S. records of flow of the South Fork Pit River above Likely, California

Irrigation diversions above station were not regulated by watermaster prior to 1933.

Storage releases from West Valley Reservoir began in 1937.

TABLE 7

FULL NATURAL FLOW, APRIL 1 TO JULY 31
SOUTH FORK OF PIT RIVER ABOVE LIKELY AND PINE CREEK NEAR ALTURAS
AS COMPARED WITH SNOW WATER CONTENT ON EAGLE PEAK APRIL 1

Year	Natural Flow Pine Creek Acre-Feet	Natural Flow So. Fk. Pit River Acre-Feet	Water Content Eagle Peak Inches
1919	5,953		
1920	6,675		
1921	10,260		
1922	7,780		
1923	5,110		
1924	5,100		
1925	7,920		
1926	6,199		
1927	10,080		
1928	7,640		
1929	5,495		
1930	5,894	24,000	11.0
1931	2,615	11,000	5.2
1932	10,300	44,500	18.7
1933	5,665	19,800	14.3
1934	3,453	13,400	3.3
1935	9,293	45,300	22.6
1936	9,300	38,300	22.1
1937	5,510	25,800	17.5
1938	12,890	64,800	23.6
1939	4,[illegible]04	19,320	10.4
1940	6,796	23,500	15.6
1941	7,180	31,480	13.8
1942	9,450	45,780	14.7
1943	13,700	52,580	23.7
1944	8,710	31,610	13.3
1945	14,800	51,630	22.2
1946	8,190	34,320	21.2
1947	5,870	20,630	6.4
1948	11,560	41,870	14.4
1949	11,670	41,020	19.1
Total 20 Yr.	167,450	680,640	313.3
Total 31 Yr.	245,660		
20 Yr. Mean	8,370	34,320	15.7
31 Yr. Mean	7,920	32,500*	14.9*

* Computed

TABLE 8

DAILY DISCHARGE IN CUBIC FEET PER SECOND
FITZHUGH CREEK ABOVE CLARK RANCH
APRIL 20 TO SEPTEMBER 30, 1949

Day	April	May	June	July	August	September
1		47	63	31	4.0	1.5
2		46	62	30	4.0	1.5
3		45	59	30	3.0	1.5
4		42	53	28	2.0	1.5
5		37	52	26	2.0	1.5
6		36	49	25	2.0	2.0
7		35	49	24	1.5	2.0
8		37	45	22	1.5	2.0
9		49	40	22	1.5	2.0
10		59	37	21	2.0	2.0
11		73	35	20	2.0	2.0
12		75	34	18.0	2.0	2.0
13		75	32	16.0	2.0	2.0
14		77	30	15.0	1.5	2.0
15		78	29	14.0	1.5	2.0
16		77	31	13.0	1.5	2.0
17		75	33	12.0	1.5	2.0
18		75	36	10.0	1.5	2.0
19		75	36	8.0	1.5	2.0
20	67	75	36	8.0	1.5	2.0
21	63	75	36	7.0	1.5	2.4
22	71	73	36	7.0	1.5	2.4
23	69	73	36	7.0	1.5	2.4
24	62	73	35	7.0	1.5	2.4
25	60	67	35	7.0	1.5	2.4
26	59	60	34	7.0	1.5	2.4
27	55	56	33	6.0	1.0	2.4
28	53	55	32	6.0	1.0	2.4
29	53	59	32	6.0	1.0	2.4
30	51	62	32	6.0	1.5	2.4
31		65		5.0	1.5	
Total	*663	1,906	1,182	464	55	62
Mean	* 60	61	39	15	1.7	2.1
Runoff in Ac.Ft.	*1,315	3,780	2,344	920	109	123

* 11-day period
Total Acre-Feet for 164 days above - 8,591

TABLE 9

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PINE CREEK NEAR ALTURAS BELOW POWER HOUSE
APRIL 1 TO SEPTEMBER 30, 1949

Day	April	May	June	July	August	September
1	18.0	50	125	28	14.0	11.0
2	18.0	60	83	28	13.5	11.0
3	18.0	51	71	28	12.0	10.5
4	18.0	47.5	60	27.5	13.0	10.0
5	19.0	46.5	60	27.5	12.0	10.0
6	19.5	44	60	26	12.0	10.5
7	67	41	52	22	10.5	10.0
8	82	48	62	22	12.0	10.0
9	33	82.5	57.5	18.0	13.0	13.0
10	36	83	53	14.5	13.0	10.5
11	36	83	53	23.5	13.0	9.0
12	35	83	46.	23	13.0	10.5
13	35	83	38	22	12.0	13.0
14	35	125	53	14.5	11.0	8.5
15	35	190	52	13.0	12.0	9.3
16	36	148	47.5	13.0	13.0	8.5
17	39.5	125	46	14.0	13.0	8.5
18	42.5	115	44	17.0	13.0	8.5
19	46	125	48	16.5	12.5	9.0
20	40	148	44	16.0	12.0	9.3
21	42.5	103	39.5	14.5	11.0	9.5
22	44	82.5	34.5	14.5	10.5	10.0
23	48	80	34	13.0	12.0	10.0
24	48	70	33	13.0	11.0	10.0
25	44	66	30	14.0	12.5	10.0
26	34	62	30	14.5	13.0	10.0
27	48	67.5	30	14.0	12.0	10.0
28	53	70	33	13.5	12.0	10.0
29	51	87.5	29	13.5	13.0	10.0
30	47.5	92	28	13.0	12.5	10.0
31		92		11.0	12.0	
Total	1,169	2,651	1,476	562	380	300
Mean	39	86	49	18	123	10
Runoff in Ac.Ft.	2,319	5,258	2,978	1,115	754	595

Total - 11,670 acre-feet for period April 1 to July 31.
Total - 13,020 acre-feet for season

TABLE 10

COMPARISON OF AVERAGE SNOW WATER CONTENT ON CEDAR PASS AND EAGLE PEAK, WITH APRIL 1 TO JULY 31 PINE CREEK RUNOFF

Year	Runoff Acre-Feet	Average Water Content - Inches		
		Cedar Pass	Eagle Peak	Average
1919	5,953			
1920	6,675			
1921	10,260			
1922	7,780			
1923	5,110			
1924	5,100			
1925	7,920			
1926	6,199			
1927	10,080			
1928	7,640			
1929	5,495			
1930	5,894	13.0	11.0	12.0
1931	2,615	8.0	5.2	6.6
1932	10,300	19.8	18.7	19.2
1933	5,665	16.3	14.3	15.3
1934	3,453	0.9	3.3	2.1
1935	9,293	21.1	22.6	21.8
1936	9,300	26.2	22.1	24.1
1937	5,510	21.6	17.5	19.6
1938	12,890	25.2	23.6	24.4
1939	4,604	10.5	10.4	10.4
1940	6,796	14.6	15.6	15.1
1941	7,180	17.9	13.8	15.8
1942	9,450	19.3	14.7	17.0
1943	13,700	25.8	23.7	24.7
1944	8,710	12.3	13.5	12.9
1945	14,800	22.4	22.2	22.3
1946	8,190	22.9	21.2	22.0
1947	5,870	10.3	6.4	8.4
1948	11,560	15.7	14.4	15.0
1949	11,670	22.0	19.1	20.6
20 Year Total	167,450	345.8	313.3	329.6
31 Year Total	245,660			
20 Year Mean	8,370	17.3	15.6	16.5
31 Year Mean	7,920	16.4*	14.8*	15.6*

* Computed

TABLE 11

DAILY RELEASES IN CUBIC FEET PER SECOND
BIG SAGE RESERVOIR

May 27 to September 30, 1949

Day	April	May	June	July	August	September
1			19	24	33	22
2			19	24	33	22
3			19	24	33	22
4			19	24	33	22
5			19	24	33	22
6			19	24	33	22
7			19	24	33	22
8			19	24	33	22
9			19	24	75	22
10			19	24	82	22
11			19	24	82	22
12			24	8	82	22
13			24	8	82	22
14			24	8	82	15
15			24	8	82	5
16			24	8	82	5
17			24	3	82	5
18			24	8	75	5
19			24	8	22	5
20			24	8	22	5
21			24	8	22	5
22			24	8	22	5
23			24	8	22	5
24			24	8	22	5
25			24	8	22	5
26			24	8	22	5
27		*19	24	8	22	5
28		19	24	8	22	**3
29		19	24	8	22	0
30		19	24	8	22	0
31		19	—	8	22	—
Total		95	665	424	1,356	369
Total Ac.Ft.		188	1,320	841	2,690	732

Total release for season - 5,770 acre-feet
*Reservoir opened - 41,500
**Reservoir closed - 29,200

TABLE 12

BIG SAGE RESERVOIR
SEASONAL OPERATION RECORD - 1935 - 1949

	Storage on Hand as of				Total Decrease	Irrigation Release	Net Losses
Year	Date	Ac. Ft.	Date	Ac. Ft.	Ac. Ft.	Ac. Ft.	Ac. Ft.
1934	Apr. 24	6,400	July 7	500	5,900	4,325	1,025
1935	May 12	15,400	Sept. 15	6,300	9,100	3,750	5,350
1936	May 8	25,200	Sept. 6	12,900	12,300	6,850	5,450
1937	May 24	23,300	Sept. 30	9,600	13,900	8,270	5,630
1938	May 31	58,000	Sept. 30	43,000	15,000	6,860	8,140
1939	Apr. 2	53,000	Sept. 12	31,750	21,250	13,100	8,150
*1940	May 9	51,700	Sept. 22	32,600	19,100	10,700	8,400
*1941	Apr. 14	51,000	Sept. 7	39,000	12,000	7,270	4,730
*1942	Apr. 20	64,500	Sept. 5	51,000	13,500	6,190	7,310
*1943	May 23	77,000	Sept. 30	59,600	18,400	8,900	9,500
*1944	May 11	61,200	Sept. 30	45,400	15,800	7,410	8,390
*1945	Apr. 1	57,800	Sept. 30	47,200	10,600	9,120	1,480
*1946	Apr. 11	61,800	Oct. 8	41,900	19,900	10,700	9,200
1947	Apr. 25	47,400	Oct. 11	28,000	19,400	10,750	8,650
1948	June 23	41,300	Oct. 1	29,300	12,000	4,660	7,340
1949	May 27	41,500	Sept. 28	29,200	12,300	5,770	6,530

* Includes sale of water to Big Valley users.

1940	1,100 Acre-Feet
1941	800 Acre-Feet
1942	300 Acre-Feet
1943	300 Acre-Feet
1944	400 Acre-Feet
1945	500 Acre-Feet
1946	400 Acre-Feet
1947	No Sale
1948	No Sale
1949	No Sale

TABLE 13

DAILY DISCHARGE IN CUBIC FEET PER SECOND

PIT RIVER NEAR CANBY

Year Mean - 242 For Year Ending September 30, 1949 Acre-Feet - 175,100

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	79	60	60	70	968	411	416	494	51	7.7	23
2	72	82	60	60	70	920	390	390	565	47	6.7	22
3	79	90	60	60	70	836	370	422	620	47	12	28
4	67	101	60	60	70	866	365	438	662	49	28	40
5	47	98	60	60	70	848	365	438	638	45	45	17
6	85	101	60	60	70	710	375	375	521	26	47	9.5
7	85	92	60	60	70	570	416	305	400	13	69	6.2
8	74	85	60	60	70	526	472	184	325	6.7	35	6.2
9	69	82	60	60	70	516	543	305	265	5.8	32	6.2
10	62	72	60	60	70	466	662	395	205	27	30	5.8
11	58	67	60	60	70	450	746	526	155	122	12	26
12	58	67	60	60	70	538	764	656	107	144	5.4	104
13	47	65	60	60	70	674	740	710	87	82	4.6	74
14	54	65	60	60	70	722	644	770	87	65	5.0	62
15	45	67	60	60	70	824	656	908	101	47	4.6	60
16	56	72	60	60	65	1,050	598	1,010	69	22	4.3	67
17	62	74	60	60	69	1,170	592	1,360	67	19	6.7	67
18	65	104	60	60	79	1,160	592	1,770	40	18	19	65
19	65	101	60	60	87	1,160	592	1,860	32	19	44	65
20	65	85	60	60	95	1,180	592	1,750	35	16	129	62
21	62	82	70	60	98	1,080	592	1,560	11	14	92	62
22	69	95	70	60	158	956	592	1,440	9.5	15	65	62
23	62	79	70	60	250	818	565	1,360	16	12	60	72
24	62	77	70	60	350	620	548	1,270	27	14	60	56
25	62	79	70	60	500	494	548	1,180	47	23	56	58
26	69	79	70	60	600	477	548	1,060	158	26	49	58
27	60	74	70	60	700	460	548	938	175	22	49	56
28	60	67	70	60	850	472	543	764	144	17	45	74
29	69	60	70	60	———	504	499	560	125	11	40	77
30	74	60	70	60	———	477	460	428	62	7.7	33	62
31	79	———	70	60	———	400	———	428	———	5.8	28	———
Total	2,022	2,401	1,970	1,860	4,951	22,912	16,328	25,976	6,249.5	1,039.0	1,124.0	2,452.9
Mean	65.2	80.0	63.5	60	177	739	544	838	208	33.5	36.3	48.4
Acre-Feet	4,010	4,760	3,910	3,690	9,820	45,450	32,390	51,520	12,400	2,060	2,230	2,880

PLATE I.

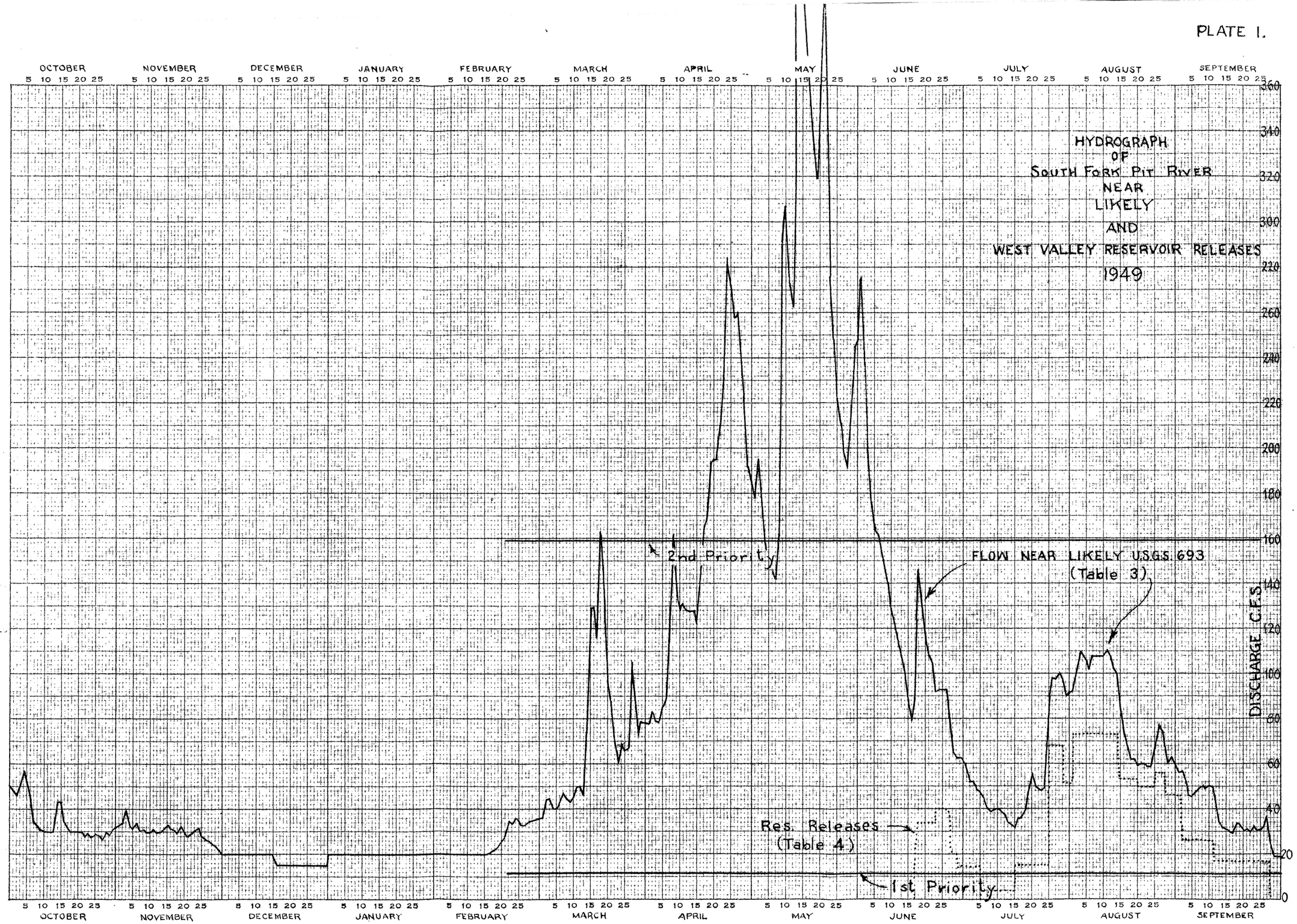
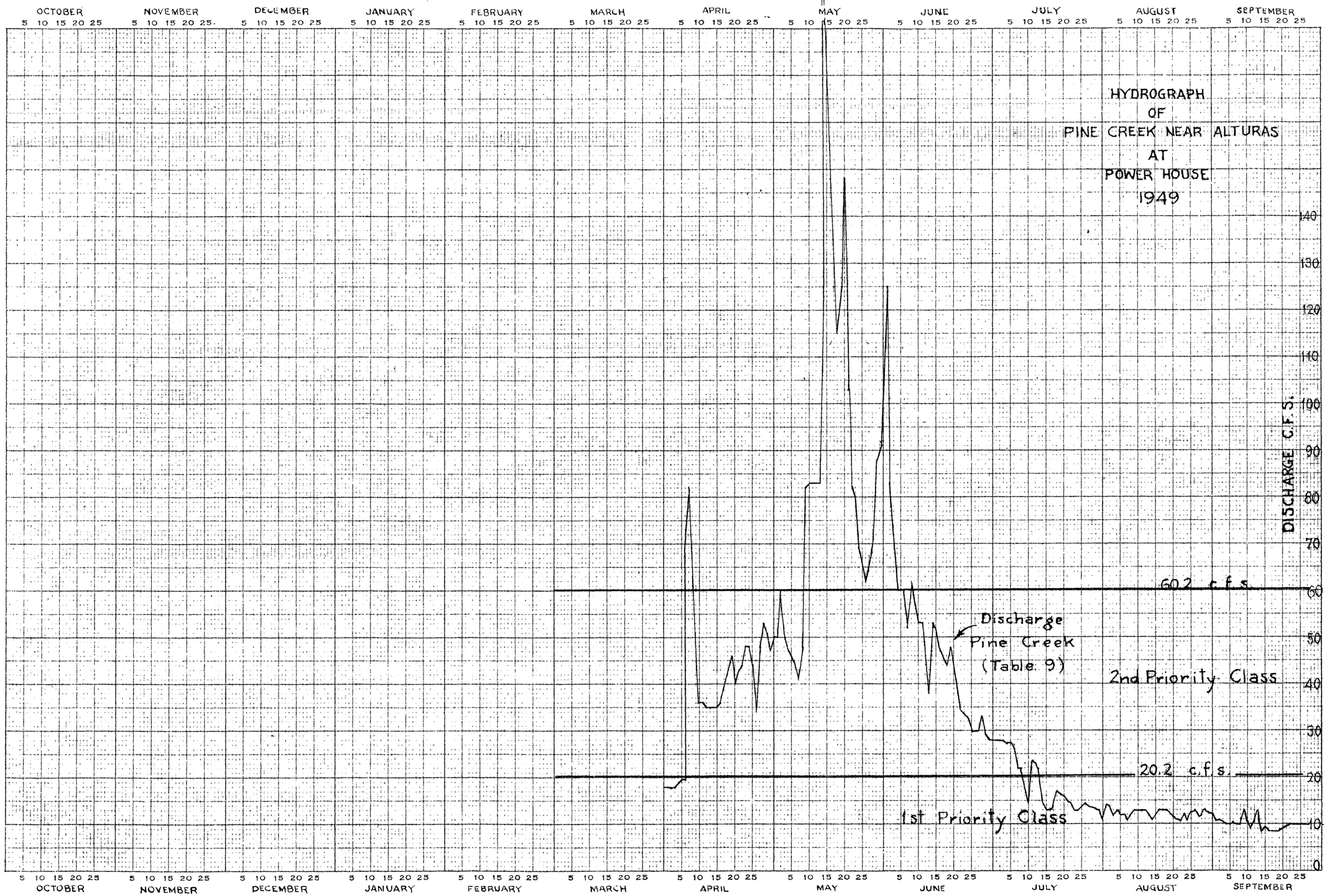
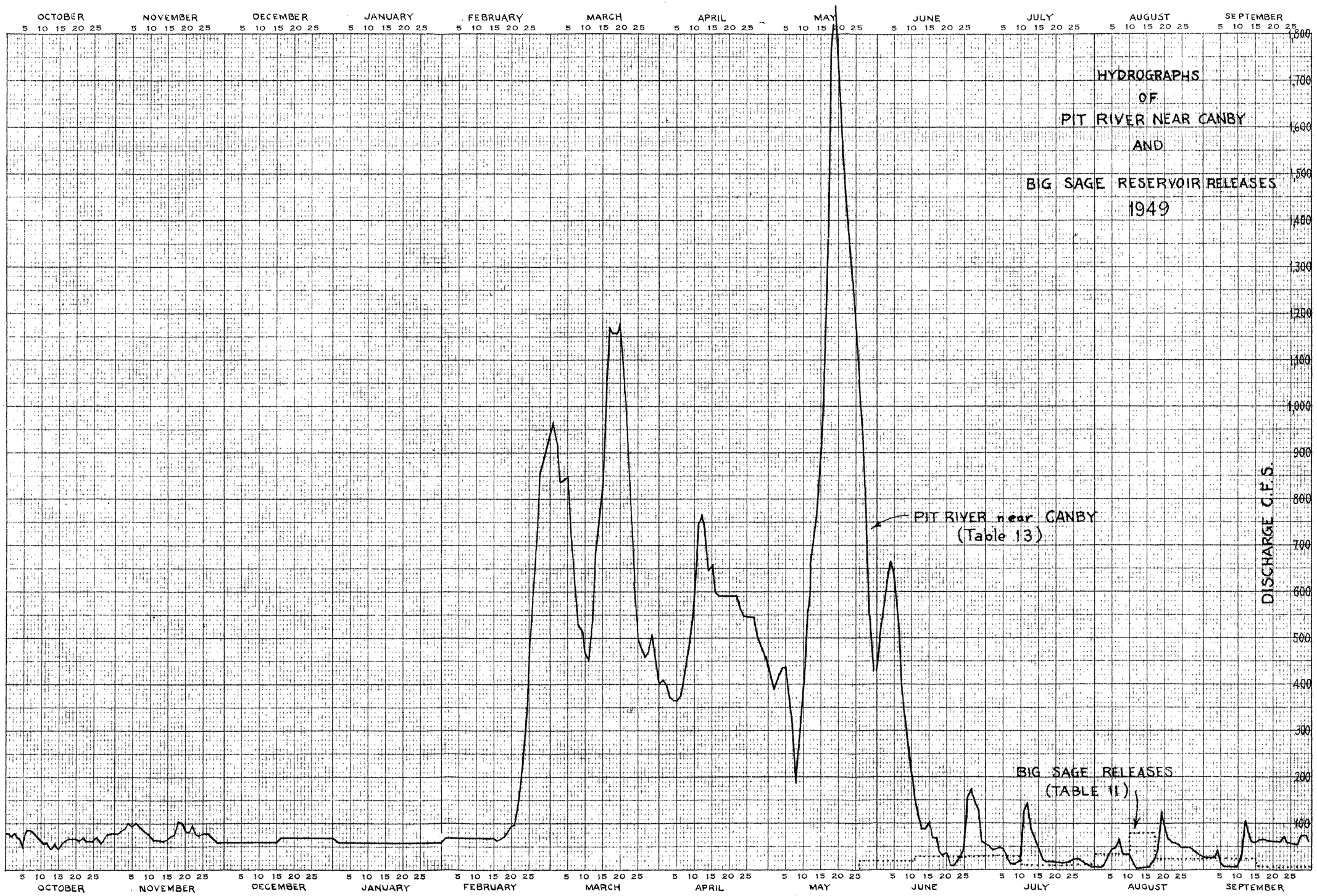

HYDROGRAPH
OF
SOUTH FORK PIT RIVER
NEAR
LIKELY
AND
WEST VALLEY RESERVOIR RELEASES
1949
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
DISCHARGE C.F.S.
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
2nd Priority
FLOW NEAR LIKELY U.S.G.S. 693
(Table 3)
Res. Releases
(Table 4)
1st Priority

PLATE 2.


HYDROGRAPH
OF
PINE CREEK NEAR ALTURAS
AT
POWER HOUSE
1949
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
DISCHARGE C.F.S.
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
60.2 c.f.s.
20.2 c.f.s.
Discharge
Pine Creek
(Table 9)
2nd Priority Class
1st Priority Class


HYDROGRAPHS
OF
PIT RIVER NEAR CANBY
AND
BIG SAGE RESERVOIR RELEASES
1949
PIT RIVER near CANBY
(Table 13)
BIG SAGE RELEASES
(TABLE 11)
DISCHARGE C.F.S.
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25