STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

EDWARD HYATT, State Engineer

REPORT ON WATERMASTER SERVICE IN

SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA
Modoc County, California
1948 SEASON

Sacramento, California

January 18, 1949

Mr. Gordon Zander
Principal Hydraulic Engineer
Sacramento, California

Dear Sir:

Herewith is submitted the annual report covering watermaster service within the South Fork Pit River Watermaster Service Area, Modoc and Lassen Counties, California, during the 1948 season.

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

Respectfully submitted,

/s/ L. C. JOPSON
L. C. Jopson
Senior Hydraulic Engineer

TABLE OF CONTENTS

	Page
INTRODUCTION	1
WATER SUPPLY	2
Precipitation	2
Stream Flow	2
DISTRIBUTION OF WATER	5
South Fork Pit River	5
Pine Creek near Alturas	7
Hot Springs Valley	7
SUMMARY	8
CONTROVERSIES	8
OWNERSHIP OF LANDS AND WATER RIGHTS WITHIN SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA	
Changes of Ownership	8

TABLES

1. Precipitation Data - Upper Pit River
2. Snow Survey Data - Upper Pit River
3. Daily Discharge in Cubic Feet Per Second - South Fork Pit River Above Likely
4. Daily Release in Cubic Feet Per Second - West Valley Reservoir
4A. Seasonal Operation Record - West Valley Reservoir 1936-1948
5. Total Seasonal Irrigation Water Supply of the South Fork Pit River
6. Comparison of Runoff During Irrigation Season - South Fork Pit River Above Likely
7. Snow Survey Deductions - South Fork Pit River Above Likely and Pine Creek Near Alturas at Power House
8. Daily Discharge in Cubic Feet Per Second - Fitzhugh Creek Above Clark Ranch
9. Daily Discharge in Cubic Feet Per Second - Pine Creek Near Alturas at Power House
10. Comparison of Average Snow Water Content on Cedar Pass and Eagle Peak with Pine Creek Runoff
11. Daily Release in Cubic Feet Per Second - Big Sage Reservoir
12. Seasonal Operation Record, 1935-1948 - Big Sage Reservoir
13. Daily Discharge in Cubic Feet Per Second - Pit River Near Canby

TABLE OF CONTENTS (Continued)

Page

PLATES

1. Hydrograph of South Fork Pit River Above Likely and West Valley Reservoir Releases
2. Hydrograph of Pine Creek Near Alturas At Power House
3. Hydrograph of Pit River Near Canby and Big Sage Reservoir Releases

REPORT ON
WATERMASTER SERVICE
IN
SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA
MODOC AND LASSEN COUNTIES, CALIFORNIA
1948 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 the 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 1948 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 during the period April 1 to September 30. Leslie C. Jopson was Supervising Watermaster.

WATER SUPPLY

Precipitation

The monthly, seasonal and average amounts of precipitation for stations in the Upper Pit River Area is given in Table 1. Each of the stations listed has a common 19 year record and comparisons are made using the 19 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.

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 data do not include any record of use in Jess Valley and storage in West Valley Reservoir, but do include the record of storage releases from that reservoir.

Table 4 is a record of the daily releases, in cubic feet per second, for West Valley Reservoir during the irrigation season.

The total net available water supply of the South Fork of Pit River for the irrigation season from April 1 to September 30 is shown in Table 5.

A comparison of the seasonal irrigation water supply to the South Fork area over a 20 year period is given in Table 6.

The basic data for a comparison of the runoff in the South Fork of Pit River above Likely to the results of the annual snow surveys is given in Table 7. In the May 1st Division of Water Resources snow survey bulletin, in which a revised forecast of flow for the April 1 - July 31 period was made, the forecast was for a flow of 105 per cent of normal or 42,000 acre-feet. The actual flow of that period was 41,870 acre-feet.

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

Fitzhugh Creek: Table 8 is a record of the available water supply of Fitzhugh Creek above the Clark Ranch. 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: Table 9 is a record of the flow of Pine Creek near Alturas at the Power House. A continuous water stage recorder is maintained by the Division of Water Resources at a point above all irrigation diversions. Plate 2 shows the daily hydrograph of flow prepared from the data in Table 9.

Table 10 gives the basic data for a comparison of the runoff in the Pine Creek Basin to the results of the annual snow surveys. 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 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.

Table 11 is a record of water released from storage in Big Sage Reservoir. Table 12 presents a comparison of the seasonal operations for the years 1935 to 1948, inclusive.

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 1948 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 12 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. Christenson	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. Derner)	1.79
R. J. Gaustad (Now Peter and John McGarva)	1.95
Jesse Hughes (Now Maston Ramsey)	2.23
Frank McArthur (Now N. H. and Mabel M. Monroe; and Clifford J. and Claude Shuck)	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

The outlook for the supply of irrigation water appeared far below normal before the start of the 1948 irrigation season.

On March 13, West Valley Reservoir was opened for a period of eleven days and again on April 19 for a period of six days in order to finish the pre-irrigation of grain lands before spring planting of barley. Pre-irrigation of grain land has in normal years been accomplished, by using early runoff prior to the beginning of meadow irrigations. However, the very limited early runoff in 1948 necessitated release of reservoir water earlier than usual. Water from West Valley Reservoir was not again necessary until after haying due to heavy rains during May and June. These rains caused floods which retarded the planting of grain. Water from West Valley Reservoir was used after the haying season for the irrigation of fall pasture in the customary manner with all users taking their percentage allotments.

The mean daily release for the 1948 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 season's flow for 1948 was 13,270 acre-feet. The April 1 - July 31 flow amounted to 11,560 acre-feet as compared with the 30 year mean of 7,800 acre-feet. For other comparisons see Table 10.

Water was allowed to be stored in Dorris Reservoir after March 31, as the available water supply on Pine Creek was more than ample for other uses until after the haying season.

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 water was made in accordance with the by-laws of the Hot Springs Valley Irrigation District. However, the major part of the water from both sources is used by the same parties through the same irrigation system and devices. The same method of distributing the water also applies to both stored water and natural flow. The Godfrey Dam was used to back water over H.M. and A.D. Dorris' lands for the second season since the dam was rebuilt in 1939. The regulation of this dam has been agreed upon by the interested parties and the agreement dated June 12, 1919, is recorded in the office of the Recorder of Modoc County.

SUMMARY

At the commencement of the 1948 irrigation season a critical shortage of water was expected. Rain during May and the first of June eased the situation materially and resulted in good to excellent crops in the area.

No water was sold to Big Valley users in 1948 as Hot Springs Valley users had to rely almost entirely on carry over storage in Big Sage Reservoir for their own use after about August 1.

CONTROVERSIES

There were no controversies over the distribution of water in the area during the 1948 season.

OWNERSHIP OF LANDS AND WATER RIGHTS WITHIN SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA

Changes in Ownership

On September 15, 1948, a search was made through the official records of Modoc County for recent changes in ownership in lands and water

rights embraced in the South Fork Pit River Watermaster Service Area. Further assistance came from various persons living within the area who furnished additional information concerning transfers of ownership.

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, California, for 1948", are listed in the following tabulation. The new names should appear in the 1949 statement.

Tract No.	Name of Water Right Owner Appearing in 1948 Statement	Name of Water Right Owner to Appear in 1949 Statement	Amount of Water c.f.s
7-25	W. H. and Gladys Flournoy	Kenneth D. and Bernardine Van Loan	4.65
7-36	George M. Clark, J. W. Clark; J.E., F.W. and Eileen A. Hignell	Herbert E. Bell, Jr.	5.00
7-39	Frank McArthur	J. C. Morgan	1.90
7-52	C. A. Bell	C. L. Stancliff	3.35
7-53	Felice Leoni	George G. Galpin	3.00
7-57	Estate of Addie F. McDowell	L. Gayle McDowell	0.70
7-79	Estate of Jesse Carl Essex	Dot L. Ranch	3.82

TABLE 1

PRECIPITATION - UPPER PIT RIVER STATIONS - 1929-1948
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
19 Yr. Total	24.04	29.82	34.31	35.94	37.33	34.92	33.25	34.23	28.43	7.04	3.77	12.80	315.88
19 Yr. Rec. Mean	1.26	1.57	1.80	1.89	1.96	1.84	1.75	1.80	1.50	0.37	0.20	0.67	16.62
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
19 Yr. Total	20.66	24.52	29.64	32.06	27.27	23.49	20.81	20.73	15.74	4.34	3.41	6.98	229.65
19 Yr. Rec. Mean	1.08	1.29	1.56	1.69	1.44	1.24	1.10	1.09	0.83	0.23	0.18	0.37	12.09
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
19 Yr. Total	22.95	25.19	32.92	31.17	32.06	27.60	23.46	25.04	24.34	3.10	3.02	9.93	260.78
19 Yr. Rec. Mean	1.21	1.33	1.73	1.64	1.69	1.45	1.23	1.32	1.28	0.16	0.16	0.52	13.72
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
19 Yr. Total	28.12	31.82	48.31	45.60	47.98	39.27	28.94	27.18	14.84	3.63	1.50	7.91	325.10
19 Yr. Rec. Mean	1.48	1.67	2.54	2.40	2.53	2.07	1.52	1.43	0.78	0.19	0.08	0.41	17.10

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

TABLE 2

SNOW SURVEY DATE--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		
Depth of Snow—Inches	63.5	53.3	22.2	42.9		
Water Content—Inches	22.2	21.2	6.4	14.4		
Density—Percent	35.0	39.8	28.8	33.6		
Record Average—Inches	15.8	16.1	15.5	15.5		
% of Record Aver.	140.5	131.7	41.0	92.9		
Cedar Pass Course Elev. 7200 Ft. Date of Survey	3/29	3/28	3/31	3/31		
Depth of Snow Inches	67.5	55.4	26.0	49.1		
Water Content Inches	22.4	22.9	10.3	15.7		
Density—Percent	33.2	41.3	39.6	31.9		
Record Average—Inches	17.2	17.5	17.1	17.1		
% of Record Average	130.2	130.8	60.0	91.8		

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

For records prior to 1945, see 1946 report.

TABLE 3

DAILY DISCHARGE IN CUBIC FEET PER SECOND
SOUTH FORK PIT RIVER ABOVE LIKELY
For Year Ending September 30, 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	12	32	50	30	21	15	52	231	108	48	44
2	13	14	27	48	30	21	19	45	243	104	48	42
3	14	18	28	38	30	21	16	45	325	83	56	42
4	12	40	28	48	30	21	14	49	432	73	64	43
5	12	36	29	50	30	21	13	65	574	79	72	44
6	12	32	26	52	30	24	18	93	574	74	83	44
7	13	33	26	49	30	24	41	126	456	65	92	45
8	14	31	28	48	35	25	50	98	385	53	114	46
9	15	30	26	34	35	25	52	69	432	42	129	47
10	19	26	28	32	35	21	56	65	405	33	135	47
11	22	29	28	27	20	21	69	59	334	54	137	46
12	20	25	28	27	25	28	63	73	293	62	135	44
13	22	22	28	26	25	28	41	102	260	56	133	45
14	22	25	26	25	35	58	49	113	236	52	131	45
15	21	29	26	25	60	58	72	140	200	50	128	44
16	30	35	24	25	38	59	78	158	184	47	118	42
17	29	34	26	25	25	60	82	204	189	43	110	39
18	22	31	26	25	30	60	86	211	186	41	110	37
19	23	27	27	25	27	59	86	162	191	40	93	37
20	17	24	27	25	27	58	89	142	213	42	77	36
21	27	27	27	25	27	56	93	142	284	49	75	35
22	24	26	28	21	30	40	83	158	206	47	75	35
23	24	26	27	21	26	35	79	146	178	46	75	39
24	23	26	23	22	25	35	49	170	154	43	73	40
25	23	30	23	24	24	19	40	217	138	45	72	41
26	23	30	22	25	26	17	42	248	128	50	71	50
27	23	33	24	25	24	16	50	290	110	54	69	48
28	24	33	31	25	23	16	48	279	102	54	56	50
29	29	30	29	25	23	14	45	243	94	53	41	50
30	20	30	30	25		15	45	226	94	48	44	49
31	12		40	30		12		271		48	45	
Total	616	844	848	972	855	988	1,583	4,461	7,831	1,738	2,712	1,296
Mean	19.9	28.1	27.4	31.4	29.5	31.9	52.8	144	261	56.1	87.5	43.2
Acre-Feet	1,220	1,670	1,680	1,930	1,700	1,960	3,140	8,850	15,530	3,450	5,380	2,570

Mean 67.6
Acre-Feet 49,080

TABLE 4

MEAN DAILY RELEASE IN CUBIC FEET PER SECOND
WEST VALLEY RESERVOIR
For Season Ending September 30, 1948

Day	March	April	May	June	July	Aug	Sept.
1						10	27
2						10	27
3						25	27
4						25	27
5						41	27
6						41	27
7						68	27
8						68	27
9						87	27
10						87	27
11						87	27
12						87	27
13	*15					87	27
14	15					87	27
15	15					87	27
16	15					73	27
17	15					73	20
18	15					73	20
19	15	32	NO RELEASE	NO RELEASE		48	20
20	15	32				48	20
21	15	28			10	48	20
22	15	28			10	48	20
23		28			10	48	20
24		28			10	48	20
25					10	48	20
26					10	48	20
27					10	48	20
28					10	27	20
29					10	27	20
30					10	27	** 20
31					10	27	
Total	150	176			110	1,656	712
Total Acre-Feet	300	350			220	3,280	1,410

Total acre-feet for season - 5,560

* Reservoir first opened - Storage 8,850 acre-feet

** Reservoir last closed - Storage 10,330 acre-feet

TABLE 4A
WEST VALLEY RESERVOIR
SEASONAL OPERATION RECORD 1936 to 1948

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

* Includes all losses and accretions

TABLE 5

TOTAL SEASONAL IRRIGATION WATER SUPPLY OF THE
SOUTH FORK OF PIT RIVER ABOVE LIKELY
APRIL 1 TO SEPTEMBER 30, 1948

	April	May	June	July	Aug.	Sept.	Total
U.S.G.S. Record #693	3,140	8,850	15,530	3,450	5,380	2,570	38,920
Operation West Valley Reservoir	+ 500	+4,000	+2,000	+ 500	-1,700	- 700	+4,600
Consumption in Jess Valley	0	900	1,800	1,200	500	500	4,900
Full Natural Flow	3,640	13,750	19,330	5,150	4,180	2,370	48,420

41,870 acre-feet natural flow, April 1 to July 31

WEST VALLEY RESERVOIR

Reservoir did not spill during the 1948 season.

An average diversion of 30 c.f.s. was made through the intake ditch from the South Fork of Pit River into West Valley Reservoir from March 25 to April 15 and from May 1 to July 11, 1948.

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 1948

Year	April	May	June	July	Aug.	Sept.	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	3,490	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

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 watermater prior to 1933.

Storage releases from West Valley Reservoir began in 1937.

TABLE 7

SNOW SURVEY DEDUCTIONS

COMPARING FULL NATURAL RUNOFF, APRIL 1 TO JULY 31
SOUTH FORK OF PIT RIVER ABOVE LIKELY, TO PINE CREEK NEAR ALTURAS
IN RELATION TO 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	4,604	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
Total 19 Yr.	155,780	639,620	294.2
Total 30 Yr.	233,990		
19 Yr. Mean	8,190	33,660	15.5
30 Yr. Mean	7,800	32,100 *	14.9 *

* Computed

TABLE 8

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PITTSBURGH CREEK ABOVE CLARK RANCH
APRIL 1 TO SEPTEMBER 30, 1948

Day	Apr.	May	June	July	Aug.	Sept.
2						
1	7.0	10.0	60.0	33.0	6.0	2.5
2	7.0	10.0	60.0	31.0	6.0	2.5
3	7.0	10.0	68.0	29.0	6.0	2.5
4	7.0	10.0	68.0	29.0	6.0	2.5
5	8.0	10.0	70.0	27.0	6.0	2.5
6	8.0	10.0	75.0	27.0	5.0	2.0
7	8.0	10.0	75.0	25.0	4.0	2.0
8	8.0	10.0	70.0	25.0	4.0	2.0
9	8.0	10.0	70.0	25.0	4.0	2.0
10	10.0	11.0	70.0	24.5	4.0	2.0
11	10.0	12.0	65.0	24.0	3.0	2.0
12	10.0	12.0	65.0	20.0	3.0	2.0
13	10.0	12.0	65.0	20.0	3.0	1.8
14	10.0	14.0	60.0	18.0	3.0	1.8
15	12.0	18.0	60.0	17.5	3.0	2.0
16	12.0	18.0	60.0	17.0	3.0	2.0
17	12.0	18.0	55.0	16.0	3.0	2.0
18	12.0	18.0	55.0	15.5	3.0	2.5
19	12.0	18.0	55.0	15.0	3.0	2.5
20	15.0	20.0	55.0	14.5	3.0	2.5
21	15.0	20.0	48.0	13.0	2.5	2.5
22	10.0	20.0	48.0	12.0	2.5	2.5
23	10.0	20.0	48.0	11.0	2.5	2.5
24	10.0	30.0	46.0	11.0	2.5	2.4
25	10.0	40.0	45.0	11.0	2.5	2.4
26	10.0	40.0	41.0	10.0	2.5	2.4
27	10.0	40.0	37.0	8.0	2.5	2.4
28	10.0	40.0	35.0	8.0	2.5	2.4
29	12.0	40.0	35.0	8.0	2.5	2.4
30	12.0	50.0	35.0	8.0	2.5	2.4
31		50.0		8.0	2.5	
Total	302	651	1699	561	108	68
Mean	10.1	21.0	56.6	18.1	3.5	2.3
Total Ac-Ft	600	1,290	3,370	1,110	214	135

Total Acre-Feet for Season - 6,719

TABLE 9

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PINE CREEK NEAR ALTURAS BELOW POWER HOUSE
APRIL 1 TO SEPTEMBER 30, 1948

Day	April	May	June	July	Aug.	Sept.
1	16.0	15.0	75.0	58.0	18.0	14.0
2	16.0	14.5	76.0	54.0	20.0	13.0
3	16.0	13.2	85.0	52.0	19.0	13.0
4	16.0	13.2	150	52.0	19.0	13.0
5	16.0	14.0	200	51.0	19.5	13.0
6	16.0	18.0	170	48.0	19.0	12.7
7	16.0	20.0	158	46.0	15.5	12.0
8	16.0	19.0	155	44.0	14.5	13.0
9	16.0	16.0	150	43.0	15.0	10.5
10	16.0	15.0	150	39.0	15.5	11.5
11	16.0	19.0	142	31.0	15.0	12.0
12	16.0	21.0	132	38.0	15.0	12.0
13	16.0	23.0	120	41.0	15.5	12.7
14	16.0	27.5	115	31.0	15.5	12.7
15	16.0	30.0	104	23.0	15.5	12.0
16	16.0	36.5	98.0	32.0	15.5	11.4
17	17.0	41.0	87.1	27.5	15.5	11.4
18	17.0	42.0	88.0	29.0	15.5	12.7
19	17.5	47.0	78.0	32.0	15.5	12.0
20	18.0	38.0	84.0	30.0	15.5	12.0
21	21.0	48.0	84.0	30.0	15.5	12.0
22	18.5	67.5	81.0	27.0	15.5	12.0
23	17.5	48.0	87.0	21.0	15.5	12.0
24	15.5	51.0	81.0	22.0	15.5	12.0
25	14.5	55.0	75.0	23.0	15.5	12.0
26	14.5	59.0	70.0	23.0	15.0	12.0
27	15.5	62.0	66.0	23.0	15.0	12.0
28	17.5	62.0	64.0	23.0	14.5	12.0
29	15.5	64.0	61.0	23.0	14.5	12.0
30	15.0	66.0	61.0	20.0	14.0	12.0
31		72.0		18.0	14.0	
Total	490	1,137	3,147	1,054	494	367
Mean	16.3	36.7	104.9	34.0	15.9	12.2
Runoff in Ac-Ft	970	2,260	6,240	2,090	980	730

Total - 11,560 acre-feet for period April 1 to July 31
Total - 13,270 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
19 Year Total	155,780	323.8	294.2	309.0
30 Year Total	233,990			
19 Year Mean	8,190	17.0	15.5	16.3
30 Year Mean	7,800	16.4 *	14.9 *	15.7 *

* Computed

TABLE 11

DAILY RELEASE IN CUBIC FEET PER SECOND
BIG SAGE RESERVOIR
JUNE 23 TO SEPTEMBER 30, 1946

Day	April	May	June	July	Aug.	Sept.
1				6	6	85
2				6	6	85
3				6	6	85
4				6	6	85
5				6	37	85
6				6	37	85
7				6	37	85
8				6	37	85
9				6	37	5
10				6	52	5
11				6	52	5
12				6	52	5
13				6	52	5
14				6	82	5
15				6	82	5
16				6	82	5
17				6	82	5
18				6	82	5
19				6	82	5
20				6	82	5
21				6	82	5
22				6	82	5
23			* 7	6	7	5
24			7	6	7	5
25			23	6	7	5
26			23	6	7	5
27			23	6	7	5
28			23	6	7	5
29			23	6	7	5
30			23	6	7	** 5
31				6	7	
Total			152	186	1,220	790
Total Ac.-Ft.			300	370	2,420	1,570

* Reservoir opened
** Reservoir closed.

Total release for season = 4,660 acre-feet

TABLE 12
BIG SAGE RESERVOIR
SEASONAL OPERATION RECORD - 1935-1948

Year	Storage on Hand as of Date	Ac.-Ft.	Date	Ac.-Ft.	Total Decrease Ac.-Ft	Irrigation Release Ac.-Ft.	Net Losses Ac.-Ft.
1934	Apr. 24	6,400	July 7	500	5,900	4,325	1,075
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	58,600	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

* Includes sale of water to Big Valley users.

1940	1100 Ac.-Ft.
1941	800 Ac.-Ft.
1942	300 Ac.-Ft.
1943	300 Ac.-Ft.
1944	400 Ac.-Ft.
1945	500 Ac.-Ft.
1946	400 Ac.-Ft.
1947	No Sale
1948	No Sale

TABLE 13

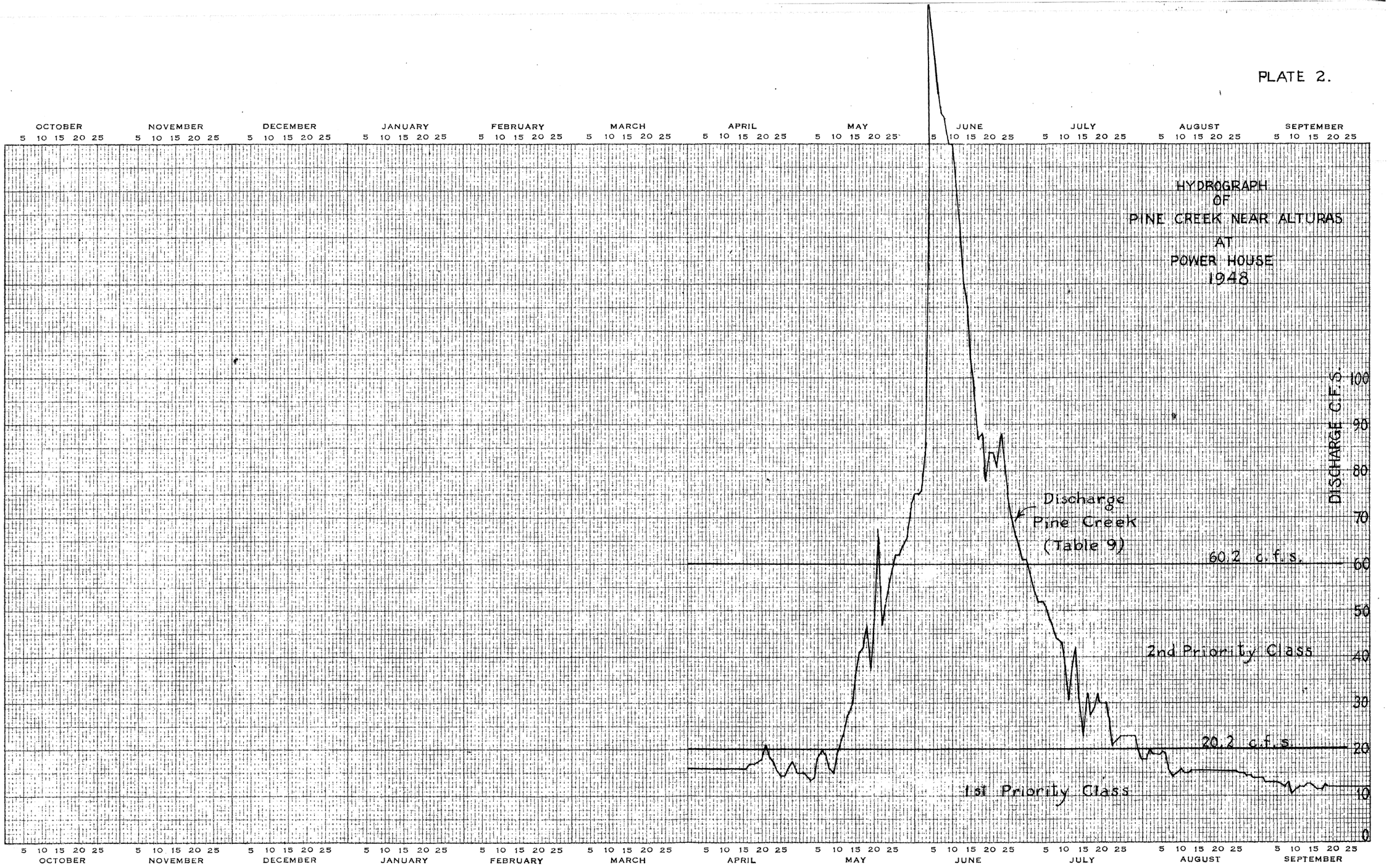
DAILY DISCHARGE IN CUBIC FEET PER SECOND

PIT RIVER NEAR CANBY

Year Mean - 198 | For Year Ending September 30, 1948 | Acre-Feet - 143,900

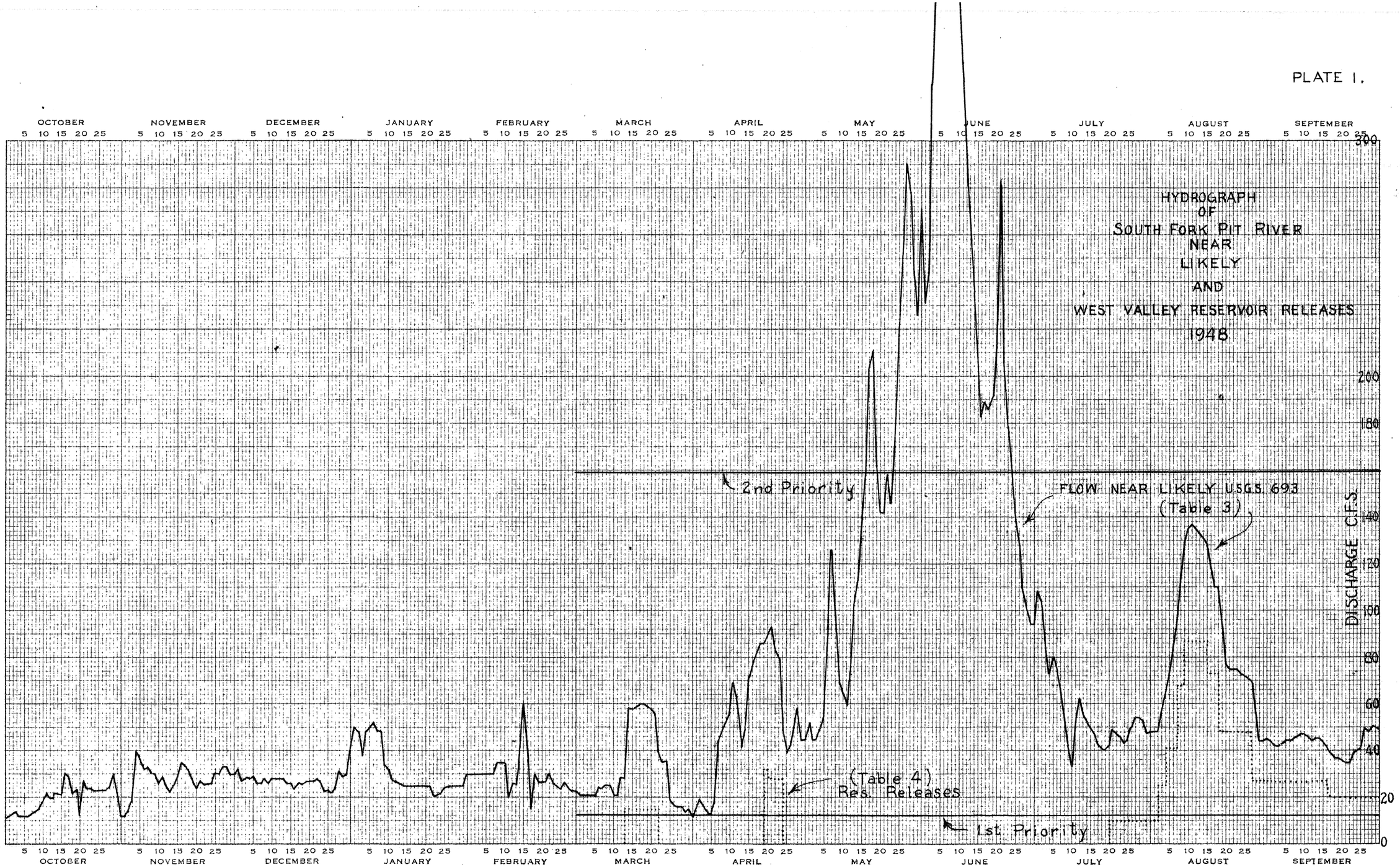
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	60	90	72	50	82	116	395	632	125	28	69
2	13	60	101	74	50	69	79	335	614	82	27	51
3	14	56	87	79	45	62	77	285	582	38	26	38
4	15	65	85	104	40	51	85	250	543	19	21	28
5	17	70	85	158	50	32	113	241	554	16	17	14
6	19	65	82	395	50	44	184	250	592	22	11	14
7	21	65	77	609	50	40	300	295	740	79	6.7	32
8	28	65	72	782	49	40	488	375	860	250	8.9	113
9	38	60	65	668	51	37	543	406	1050	214	11	175
10	30	55	50	570	45	32	614	380	1230	92	10	132
11	30	55	60	340	45	22	866	345	1290	82	9.5	98
12	54	60	60	175	40	26	1120	265	1240	104	8.9	98
13	40	55	65	125	50	27	1030	205	1150	90	7.2	82
14	33	50	65	110	49	27	866	158	1050	77	7.2	42
15	32	55	67	85	67	24	782	214	944	62	8.9	40
16	40	60	51	85	104	26	668	236	830	101	7.2	47
17	54	65	74	85	132	37	614	210	692	79	6.7	44
18	45	65	67	80	122	49	609	155	532	67	7.7	47
19	27	60	74	70	110	49	592	494	385	62	14	47
20	18	55	74	80	132	42	510	1060	395	60	42	47
21	23	55	69	70	101	44	444	1130	438	56	49	47
22	92	55	72	70	90	45	428	1110	455	44	110	47
23	110	60	72	70	82	125	438	1100	477	30	107	45
24	77	60	70	65	82	315	406	1170	482	22	92	60
25	74	60	70	60	79	466	375	1120	444	26	90	69
26	67	62	70	60	74	521	325	1020	360	33	92	65
27	62	54	74	60	77	472	315	860	290	32	90	77
28	65	65	77	60	74	380	330	764	223	30	74	92
29	58	77	70	60	82	330	380	710	162	32	62	79
30	62	82	65	55	____	340	428	686	147	32	90	79
31	69	____	60	60	____	175	____	656	____	30	98	____
Total	1339	*1831	*2220	*5436	*2072	*4031	*14125	*16880	*19383	*2088	*1239.9	*1918
Mean	43.2	61.0	71.6	175	71.4	130	471	545	646	67.4	40.0	63.9
Acre-Feet	2,660	3,630	4,400	10,780	4,110	8,000	28,020	33,480	38,450	4,140	2,460	3,800

PLATE 2.



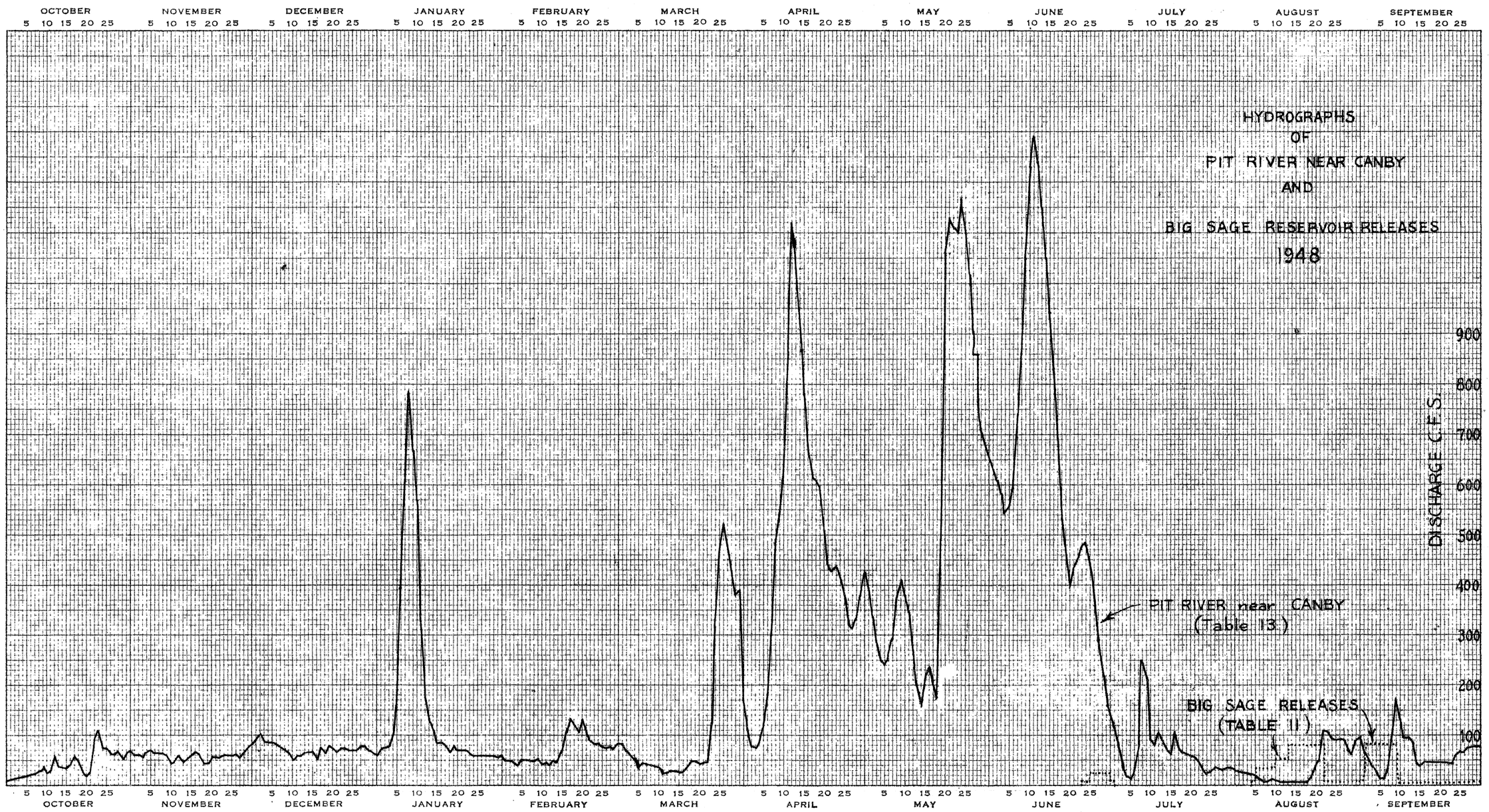
K & E CO., N. Y.
36573

PLATE I.



K & F CO., N. Y.
38573

PLATE 3.



K & E CO., N. Y.
38573

45 - 47

$81\overset{7}{1}0$

Ev. 3.47 in

annual yield

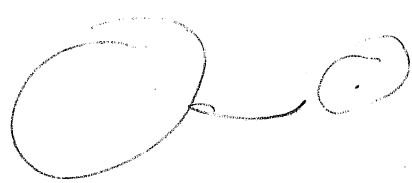
Precip

% annual flow

$7 \times 81\cancel{1}0 - \left(\frac{3.47}{12} \times 900\right) + \left(\frac{1.61}{12} \times 900\right)$

Ev.

leases + diversion from S.F = Change in Storage

3430

1030