STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

CULBERT L. OLSON, Governor
FRANK W. CLARK, Director of Public Works
EDWARD HYATT, State Engineer

REPORT OF

SACRAMENTO-SAN JOAQUIN
WATER SUPERVISION

FOR YEAR

1941

JUNE, 1942

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DEPARTMENT OF PUBLIC WORKS
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SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

FOR
1941

Sacramento
June, 1942

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ACKNOWLEDGMENT

In the conduct of the activities and investigations under the heading of "Sacramento-San Joaquin Water Supervision", valuable assistance has been rendered by many individuals and public and private agencies.

Land owners and water users and the executives, engineers, managers, and water superintendents of the various water organizations throughout the territory covered by this work have cooperated fully in furnishing the many and varied data requested.

For the compilation of pumped diversions the Pacific Gas and Electric Company, and Merced, Modesto and Turlock Irrigation Districts have furnished a large number of power consumption records.

Valuable cooperation has been extended by the Water Resources Branch of the United States Geological Survey, Department of the Interior in gathering and assembling stream flow data.

The State Division of Highways has cooperated in the expeditious and efficient testing of salinity samples in its testing laboratory. The Maintenance Department has cooperated in taking water samples from the Sacramento and San Joaquin valley stream flow channels.

In the San Joaquin Valley the City of San Francisco Public Utilities Commission, Hetch Hetchy Water Supply and the United States Bureau of Reclamation make available a large amount of stream flow data.

The Merced, Modesto, Oakdale, South San Joaquin and Turlock Irrigation Districts and Miller and Lux, Incorporated, have assisted in observing and maintaining recording and staff gages in the San Joaquin Valley as has the United States Bureau of Reclamation.

ORGANIZATION

Culbert L. Olson - - - - - - - - - - - - - - - - Governor
Frank W. Clark - - - - - - - - Director of Public Works
Edward Hyatt - - - - - - - - - - - - - - - State Engineer

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Harold Conkling - - Deputy in Charge of Water Rights

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Part and full time gage and salinity observers

-O-

ADVISORY COMMITTEE

PERMANENT COMMITTEE OF THE SACRAMENTO-SAN JOAQUIN RIVER PROBLEMS CONFERENCE

This Committee, representing the water users and other interests involved, was appointed by the First Sacramento-San Joaquin River Problems Conference in January 1924. Its continued interest and cooperation and particular activity in the promulgation of effective conservation measures in the seasons of critical water supply have contributed in large measure to the successful prosecution of the Water Supervision Work.

Herbert E. White, Chairman, Sacramento

E. L. Adams, Chico
A. E. Anderson, San Francisco
Alden Anderson, Sacramento
G. A. Atherton, Stockton
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R. V. Meikle, Turlock
Jesse Poundstone, Grimes
F. T. Robson, Vina

CHAPTER 1

INTRODUCTION

The purpose of this report is to make of record the measurements made and data collected in connection with Water Supervision in the Sacramento-San Joaquin Valley area during 1941.

Origin and History of Work

Water Supervision was inaugurated in 1924 through the efforts of the first Sacramento-San Joaquin River Problems Conference and its Permanent Committee working with the former Division of Water Rights. A complete description of the origin, history and conduct of this work will be found in the 1924 and 1926 Biennial Reports of the former Division of Water Rights, in Bulletin Number 4 of the same Division, and in Bulletin Number 23 of the Division of Water Resources. The latter Bulletin brings together all data and measurements obtained in the five-year period, 1924 to 1928, inclusive. The Water Supervision report for subsequent years are mimeographed as is the present report. In this report is presented a summary of data relative to stream and return flow for previous years.

Objectives

The work of supervision is a measure of relief in the difficulties attendant upon water supply conditions and the use of water throughout the Sacramento-San Joaquin territory, partieularly on the Sacramento River and in the Delta region. The situation involves the major problem of satisfying the water requirements for irrigation in both the upriver areas and the Delta, for the control of salinity in the Delta and Upper Bay areas, and for navigation above Sacramento as demanded by the U. S. War Department. In nearly every season of the last eighteen

years, each one of those requirements has exceeded the available summer flow in the rivers. Pending ultimate relief through the development of reservoir storage this situation has been met by mutual agreement through a provisional administration of stream flow and diversions. There has been no agreement, though, under which a water master might definitely and equitably distribute the existing water supply to those entitled to receive it, but it seems inevitable that such an agreement or a definite schedule of water priorities must be developed. Its realization will require, however, that there shall be available reliable and accurate data over a long period of years covering all of the actual diversions and uses of water, the stream flow, return flow, salinity, and all pertinent hydrographic data. Looking to this requirement, the Division of Water Resources is, concurrently with the provisional stream administration, continuing the investigations and all measurements necessary to complete the record of basic data.

Investigational Work

During 1941 as in the past years, the investigational work comprised: Measurements and record of the diversions of water from Sacramento, Feather, Yuba, American, Merced, Tuolumne, Stanislaus and San Joaquin rivers on the valley floor and above the Delta; stream flow measurements throughout the territory partially in cooperation with the Water Resources branch of the U. S. Geological Survey, measurements and records of waters returned to the Sacramento and San Joaquin rivers; an annual census of irrigated acreages and crops under all diversions recorded; and at intervals a complete survey of irrigated acreage in the Sacramento-San Joaquin Delta; maintenance and operation of recording tide gages in the Delta area. The salinity sampling in the Delta, by which the rate of advance and retreat of salinity was studied, was discontinued on

July 15, 1941. Prior to this date samples were taken at four-day intervals at key stations throughout the Delta area and upper bays.

History of State and Water Users' Cooperative Financing

The complete history of the State and water users' cooperative financing for previous years has been published in prior reports.

Conservation Features

A comparison of the run-off and water supply conditions of the 1941 season with those of previous seasons is indicated in Tables 1 and 2. Tables 1A and 2A show for streams in Sacramento and San Joaquin Valley a summary of the average minimum 10-day flow occurring during the years 1924-1941 for period March 1 to September 30. It will be noted in Tables 1 and 2 that under the column "Run-off in Per Cent of Normal", the 40-year and 50-year mean percentages are given. The 50-year figure is based on a recent recalculation of mean full natural flow of the Sierra streams. Table 3 gives a comparison between the 40-year and 50-year mean full natural flow for all major streams entering the Great Central Valley.

TABLE 1

COMPARATIVE SACRAMENTO VALLEY WATER SUPPLY 1920 - 1941

Year	Run-off in per cent of Normal*		Minimum Mean Daily Flow in Second Feet (1)									Rice Acreage Served By Sacramento River & Tributaries
			Sacramento River at			Feather River at		Yuba River at		American River at		
	Sacto.-San Joaquin to Delta	Sacramento at Red Bluff	Red Bluff	Colusa	Sacramento	Oroville	Nicolaus	Smartville	Mouth	Fairoaks	Sacramento	
	40: 50	40 :50										
	Yr.:Yr.	Yr.:Yr.										
1920	50: 52	45: 48	3240	660	(2)540	905	(3)19	106		100	(2)114	
1924	28: 28	35: 38	2810	1470	705	720	Zero	71		5	Zero	88500
1925	83: 86	86: 92	3240	1870	2760	1330	334	150		219	203	94700
1926	57: 60	61: 65	2980	1030	1330	1400	264	114		109	161	128600
1927	114:121	117:125	3580	1960	3420	1460	565	240		274	334	123300
1928	80: 84	82: 87	3400	1960	2510	1210	310	180		109	178	101100
1929	42: 44	47: 50	3060	1550	2300	1640	520	119		59	50	73700
1930	63: 65	65: 70	2980	1680	2350	1560	586	220		105	130	88000
1931	28: 30	35: 38	2480	820	-131	950	Zero	130		30	28	126500
1932	74: 78	54: 58	2620	1530	1900	685	284	181		178	159	90700
1933	45: 48	49: 52	2620	1350	1340	1050	200	165		32	30	87400
1934	40: 43	48: 51	2400	1320	1050	1180	208	144		77	75	91800
1935	86: 91	80: 86	2860	1780	2700	1470	690	250		178	185	78100
1936	91: 96	76: 81	2700	1540	2150	1560	603	266		356	415	104400
1937	75: 80	64: 68	2780	1370	1640	1420	230	219		234	230	109400
1938	160:170	157:168	3880	3000	4950	1690	772	295		455	439	94800
1939	41: 43	47: 50	2700	1320	556	1360	68	168	38	37	44	103800
1940	108:115	112:120	3220	2040	2430	1600	438	177	118	279	274	94200
1941	130:138	143:164	4180	2700	4020	1680	575	230	106	255	261	119800

(1) Minimum flow that occurred prior to September 30th.
(2) No continuous record. Lowest measured discharge.
(3) Lowest measured discharge at mouth of river, August 19th.

* (40-year normal taken as 40-year mean (1889-1929) of natural run-off at foothill stations of major tributaries.
(50-year normal taken as 50-year mean (1889-1939) of natural run-off at foothill stations of major tributaries.

TABLE 1A

AVERAGE MINIMUM 10-DAY FLOW FOR SACRAMENTO VALLEY STREAMS
FOR PERIOD MARCH 1 TO SEPTEMBER 30, 1924-1941

Year	SACRAMENTO RIVER																	
	At Kennett		Near Red Bluff		At Butte City		At Colusa		At Wilkins Slu		At Knights Ldg.		At Verona		At Sacramento	
	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.
1924	No record		8/8	2840	7/21	1580	7/23	1540			7/20	1060	No record		7/14	858
1925	No record		8/9	3400	9/1	2150	8/7	2030	No record		8/8	1990	No record		8/7	2860
1926	8/8	2710	9/20	3030	8/10	1350	8/11	1060	prior		8/1	1120	8/1	1620	7/28	1460
1927	8/20	3240	9/9	3680	8/20	2330	8/22	1990	to		8/20	2220	8/13	3420	8/23	3560
1928	9/6	3120	9/7	3490	8/19	2150	8/14	2000	1931		8/15	1920	8/14	2760	8/15	2660
1929	9/1	2820	9/11	3060	8/19	1680	8/19	1570			8/20	1400	7/18	2440	7/18	2460
1930	9/1	2800	8/27	2980	8/20	1880	8/19	1690			8/20	1460	8/22	2640	8/5	2500
1931	8/22	2510	8/10	2550	7/28	1080	7/26	860	7/27	797	7/21	279	7/21	327	7/20	-80
1932	9/25	2570	9/7	2680	9/30	1530	8/27	1550	8/8	958	8/11	1030	8/11	1890	8/11	1980
1933	9/1	2580	8/24	2640	8/19	1370	8/23	1360	8/20	714	8/15	964	8/6	1470	8/21	1450
1934	9/21	2430	9/13	2480	8/20	1320	8/22	1330	8/19	658	8/6	773	8/10	1300	7/20	1150
1935	9/6	2780	9/6	2940	9/28	1820	8/27	1820	8/29	1130	8/10	1610	8/30 ?	2980	8/12	2920
1936	9/30	2580	9/26	2880	8/18	1630	8/19	1580	8/18	1100	8/8	1370	8/20	2420	8/20	2540
1937	9/26	2640	8/25	2900	8/25	1450	8/27	1410	8/28	870	8/16	1120	8/16	1810	8/16	1720
1938	9/22	3680	9/19	3940	9/5	3060	8/23	3130	8/22	2690	8/10	2980	8/12	4920	8/12	5190
1939	8/25	2830	8/25	2850	8/10	1400	8/8	1370	8/5	683	7/30	785	8/5	1030	8/5	630
1940	8/29	3200	8/23	3410	8/25	2040	8/18	2140	8/18	1370	8/18	1670	8/12	2510	8/12	2550
1941	9/25	3950	9/10	4380	8/22	2830	8/24	2980	8/23	2270	8/23	2680	8/25	4010	8/24	4190

NOTE: For minimum flow see Table 1.

TABLE 1A (CONTINUED)

AVERAGE MINIMUM 10-DAY FLOW FOR SACRAMENTO VALLEY STREAMS
FOR PERIOD MARCH 1 TO SEPTEMBER 30, 1924-1941

Year	FEATHER RIVER				YUBA RIVER				AMERICAN RIVER				MOKELUMNE RIVER		CALAVERAS RIVER	
	Near Oroville		At Nicolaus		At Smartville		Near Marysville		At Fairoaks		At Sacramento		At Woodbridge		At Jenny Lind	
	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.
1924	7/8	823	8/10	0	7/31	84			8/5	5	8/4	5	9/1	1	No record	
1925	9/3	1600	8/22	460	8/31	158			8/26	237	8/27	240	8/23	33	8/15	0
1926	7/1	1720	8/15	470	9/16	126			8/25	157	8/27	180	8/11	3	8/15	0
1927	9/20	1780	8/27	670	9/25	261			9/21	309	8/27	370	9/20	2	9/15	0
1928	9/20	1330	8/13	330	9/25	212			8/23	188	8/22	230	8/30	2	9/15	0
1929	7/8	1770	7/16	583	9/25	124			9/25	94	9/30	69	7/17	33	9/10	0
1930	7/16	1040	7/18	694	9/22	235			8/20	166	8/21	162	7/1	4	9/10	1
1931	9/23	1060	7/15	0	8/31	133	No Record		8/15	53	8/17	43	9/25	3	9/10	0
1932	9/23	820	9/5	293	9/10	186	prior		9/10	202	9/14	193	8/11	249	9/10	0
1933	9/20	1120	9/5	222	9/20	169	to		9/9	72	9/9	70	6/23	140	8/15	0
1934	9/12	1300	9/7	308	9/7	150	1939		9/1	93	9/6	110	6/25	8	8/15	0
1935	9/12	1580	9/17	975	9/16	266			9/6	204	9/6	199	8/16	206	9/10	0
1936	9/9	1880	8/30	835	9/22	278			8/28	410	8/30	438	7/17	162	9/15	0
1937	9/9	1440	8/11	265	8/20	230			9/17	264	9/16	287	7/31	140	9/15	0
1938	9/7	2070	9/7	1020	9/8	324			9/20	462	9/16	448	9/10	212	9/15	2
1939	8/5	1380	8/6	87	9/25	182	8/15	42	9/9	47	8/8	49	4/25	44	9/10	0
1940	8/7	1650	8/10	490	8/17	280	9/1	120	8/26	340	8/26	330	8/16	122	9/15	0
1941	9/17	1820	8/23	640	9/12	260	9/14	120	9/17	320	9/19	340	7/20	146	9/25	1

NOTE: For minimum flow see Table 1.

TABLE 2

COMPARATIVE SAN JOAQUIN VALLEY WATER SUPPLY 1920-1941

Year	Run-off in per cent of normal*				Minimum Flow in Second-feet (1)																			
	Sacramento and San Joaquin to Delta		San Joaquin at Vernalis		San Joaquin River			Merced River		Tuolumne River		Stanislaus River			Calaveras River at Jenny Lind	Moke-lumne River at Wood-bridge	Cosumnes River at Michigan Bar						
					near Vernalis	near Newman	at (3) Fremont Ford Br.	at Yosemite Val. R.R.	near Mouth	at La Grange Br. (4)	at Tu-olumne City	at Orange Blossom Bridge	at Hatmark Ranch (5)											
	40 Yr	50 Yr	40 Yr	50 Yr																				
1920	50	52	63	66	(2)450	62																		
1924	20	28	24	24	391	15	0	0	(2) 2	(2) 29	(2) 245	(2) 14	(2) 95		0		1							
1925	83	86	86	88	660	114	0	(2) 4	(2) 73	(2) 35	(2) 299	(2) 19	(2)161		0	1	0							
1926	57	60	55	56	565	62	0	(2) 5	(2) 53	(2) 32	(2) 286	(2) 15	(2)116		0	3	6							
1927	114	121	100	104	1290	305	0	(2)12	(2) 204	(2)204	(2) 391	(2) 29	(2)275		0	3	0							
1928	80	84	67	70	840	205	0	6	53	38	292	31	194		0	1	6							
1929	42	44	44	46	565	105	0	4	65	32	287	30	205		0	2	2							
1930	63	65	50	53	645	170	0	7	92	60	344	32	216		0	3	1							
1931	28	30	26	27	200	22	0	1	17	25	243	25	81		0	3	1							
1932	74	78	101	106	965	251	0	27	165	37	348	35	223		0	150	0							
1933	45	48	51	54	569	187	0	7	127	36	280	19	185		0	81	1							
1934	40	43	35	37	315	62	(2) 5	7	36	26	270	20	104		0	6	0							
1935	86	91	98	103	850	306	(2) 97	46	206	34	345	28	199		0	84	2							
1936	91	96	100	104	980	360	150	25	190	33	375	28	194		0	65	4							
1937	75	80	100	105	950	333	115	12	211	3	355	17	212		0	106	2							
1938	160	170	172	180	2030	702	280	66	335	8	460	22	270		1	143	14							
1939	41	43	44	46	545	202	32	2	155	3	310	13	140		0	36	0							
1940	108	115	101	105	996	340	99	7	200	3	365	17	217		0	71	1							
1941	130	138	121	127	1300	412	187	18	238	19	300	13	252		0	55	5							

*40-year normal taken as 40-year mean (1889-1929) of natural run-off at foothill stations of major tributaries.
*50-year normal taken as 50-year mean (1889-1939) of natural run-off at foothill stations of major tributaries.

(1) Minimum flow that occurred prior to September 30th.
(2) No continuous record. Lowest discharge measured.
(3) Prior to 1934 station maintained at Delta Bridge.
(4) Prior to 1937 station maintained at Roberts Ferry Bridge. Minimum flow at Roberts Ferry for 1937, 1938 and 1939 was 18, 20, and 34 cubic feet per second, respectively.
(5) Station at Hatmark abandoned Sept. 30, 1940. New station established at Bret Harte pump Sept. 30, 1940.

TABLE 2A

AVERAGE MINIMUM 10-DAY FLOW FOR SAN JOAQUIN VALLEY STREAMS
FOR PERIOD MARCH 1 TO SEPTEMBER 30, 1924-1941

Year	SAN JOAQUIN RIVER													
	Near Friant		At Fremont Ford Br		Near Newman		At Grayson		At Hetch Hetchy Cross.		Near Vernalis	
	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.
1924	9/17	185			8/9	17					9/2	410
1925	9/23	596			9/25	122					9/29	740
1926	9/16	578	No continuous record prior to 1936		9/19	77	No continuous record prior to 1930		No continuous record prior to 1936		8/21	590
1927	9/25	787			9/2	326					8/23	1300
1928	9/25	813			8/20	234					8/22	870
1929	9/25	477			7/21	116					8/13	591
1930	9/25	678			7/20	184	8/8	230			8/4	740
1931	9/22	111			8/23	33	8/26	24			7/20	211
1932	9/21	1040			9/5	267	9/7	410			9/6	1020
1933	9/21	1090			8/15	196	8/15	270			8/14	607
1934	9/14	360			9/3	706	8/12	123			8/14	347
1935	9/25	1210			8/27	333	9/11	449			8/13	922
1936	9/24	1200	8/18	161	8/12	387	8/17	557	8/16	835	8/11	1040
1937	9/22	1130	8/21	122	8/23	364	9/24	517	8/23	744	8/23	1022
1938	9/21	1200	9/25	306	9/24	725	9/14	941	8/26	1800	8/27	2130
1939	*9/20	727	8/10	36	8/20	219	7/25	235	7/26	443	7/25	610
1940	9/23	896	8/23	101	8/20	345	8/24	520	8/13	875	8/10	1070
1941	9/11	1220	9/12	220	9/25	470	9/15	720	9/15	1360	9/14	1480

* New station started "Below Friant".

NOTE: For minimum flows see Table 2.

TABLE 2A (CONTINUED)

AVERAGE MINIMUM 10-DAY FLOW FOR SAN JOAQUIN VALLEY STREAMS
FOR PERIOD MARCH 1 TO SEPTEMBER 30, 1924-1941

Year	STANISLAUS RIVER								MERCED RIVER							
	At Orange Blossom Br.		At Burneyville Br.		At Ripon		At Bret Harte		At Hatmark Ranch		At Yosemite Valley R. R.		At Cressey Br.		Near Livingston		Near Mouth	
	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.
1924															8/1	26		
1925	No record		No record		No record		No record		No record		No record		No record		No record		No record	
1926	prior		prior		prior		prior		prior		prior		prior		9/24	53	prior	
1927	to 1930		to 1940		to 1940		to 1941		to 1930		to 1930		to 1941		8/28	121	to 1930	
1928															8/15	118		
1929															9/25	89		
1930	9/15	32							8/11	241	9/25	3			6/9	97	8/16	126
1931	9/15	25							8/17	96	9/18	1			9/20	55	8/23	258
1932	9/25	35							8/11	241	8/6	18			8/7	140	8/8	190
1933	9/22	19							9/5	215	9/25	11			8/21	121	8/13	141
1934	9/20	20							8/15	137	9/25	2			9/3	82	8/18	68
1935	9/1	28							9/22	230	9/9	48			9/22	159	9/16	220
1936	8/25	28							9/26	230	8/8	37			8/10	178	9/24	216
1937	9/21	17					Station		9/10	226	9/25	21			9/20	199	8/16	228
1938	9/11	20					established		9/16	280	8/10	76			9/12	258	9/18	342
1939	9/11	14					10/1/40		8/20	144	9/21	7			8/8	124	8/8	174
1940	9/24	19	9/25	98	9/24	212			8/13	248	9/14	7			9/16	160	9/17	218
1941	9/15	18	9/25	86	9/15	209	9/22	262	Station discontinued 9/30/40		7/21	24	9/15	108	9/10	164	9/14	257

NOTE: For minimum flows see Table 2.

TABLE 2A (CONTINUED)

AVERAGE MINIMUM 10-DAY FLOW FOR SAN JOAQUIN VALLEY STREAMS
FOR PERIOD MARCH 1 TO SEPTEMBER 30, 1924-1941

Year	TUOLUMNE RIVER										DRY CREEK	
	At La Grange Br.		At Roberts Ferry Br.		At Hickman Br.		At Modesto Br.		At Tuolumne City		Near Modesto	
	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.	Date	c.f.s.
1924												
1925												
1926												
1927	No record		No record		No record		No record		No record		No record	
1928	prior to 1936		prior to 1930		prior to 1932		prior to 1940		prior to 1930		prior to 1930	
1929												
1930			8/1	78					8/3	366	7/7	41
1931			9/25	25					7/28	249	9/16	19
1932			8/27	40	8/26	105			8/28	358	8/18	50
1933			8/19	37	8/11	102			8/3	310	7/18	41
1934			9/7	28	7/1	94			9/17	284	9/25	38
1935			8/31	35	9/6	100			8/10	370	8/15	48
1936			8/28	36	8/14	123			9/13	385	9/30	62
1937	8/15	3	8/17	19	8/21	123			8/15	363	9/18	51
1938	8/21	10	8/20	29	8/24	155			8/25	468	7/31	69
1939	6/10	3	6/15	36	4/20	138			6/18	326	9/4	38
1940	8/3	4	7/21	40	7/25	110	8/14	290	8/7	380	9/9	45
1941	8/5	137	8/6	190	8/6	211	9/13	480	9/13	595	7/25	55

NOTE: For minimum flows see Table 2.

TABLE 3

COMPARISONS BETWEEN 40 AND 50 YEAR MEAN FULL NATURAL FLOWS*

River and Station	40-Year Mean Full Natural Flow 1889-90 to 1928-29 (Acre-feet)	50-Year Mean Full Natural Flow 1889-90 to 1938-39 (Acre-feet)	Changes in Mean
Sacramento at Red Bluff	9,354,000	8,747,000	-7%
Feather at Oroville	5,201,000	4,853,000	-7%
Yuba at Smartville	2,653,000	2,490,000	-6%
Bear at Wheatland	402,000	373,000	-7%
American at Fairoaks	3,069,000	2,879,000	-6%
Sacramento at Sacramento	20,679,000	19,342,000	-6%
Cosumnes at Michigan Bar	407,000	382,000	-6%
Mokelumne at Mokelumne Hill	853,000	802,000	-6%
Calaveras at Jenny Lind	227,000	210,000	-7%
Stanislaus below Melones	1,350,000	1,273,000	-6%
Tuolumne at La Grange	2,070,000	1,985,000	-4%
Merced at Exchequer	1,115,000	1,069,000	-4%
San Joaquin at Friant	1,995,000	1,914,000	-4%
San Joaquin at Vernalis	6,530,000	6,241,000	-4%
Combined flow to Delta	28,695,000	26,977,000	-6%
Kings at Piedra	1,889,000	1,818,000	-4%
Kaweah at Three Rivers	443,000	433,000	-2%
Kern at Bakersfield	725,000	710,000	-2%

(40-year normal taken as 40-year mean (1889-1929) of natural run-off
(at foothill stations of major tributaries.

*

(50-year normal taken as 50-year mean (1889-1939) of natural run-off
at foothill stations of major tributaries.

CHAPTER II

MEASUREMENTS OF STREAM FLOW

During the season of 1941, annual stream flow measurements and records were obtained through cooperation with the Water Resources Branch of the U. S. Geological Survey for stations on the Sacramento River at Kennett, Red Bluff, Butte City, Colusa, Wilkins Slough, Knights Landing and Verona; on the Feather River at Oroville and Nicolaus; on the Yuba River at Smartville and Marysville; on the American River at Fairoaks and Sacramento; on the Mokelumne River at Woodbridge; on the San Joaquin River below Friant, at Fremont Ford Bridge near Newman, and near Vernalis; on the Merced River near Livingston, on the Tuolumne River at Tuolumne City; Stanislaus River near Ripon and Bret Harte Pump.

The above cooperative stations were supplemented by stations maintained by the Division of Water Resources in connection with the San Joaquin return water measurements (See Chapter IV), and in cooperation with the Merced, Modesto, Oakdale, South San Joaquin and Turlock Irrigation Districts, the City and County of San Francisco through the Hetch Hetchy Water Supply Division and the U. S. Bureau of Reclamation, at the following places: San Joaquin River at Delta Bridge, Fremont Ford Bridge, Mud Slough, Grayson (Laird Slough) and Hetch Hetchy Aqueduct Crossing; Merced River at Yosemite Valley Railroad Crossing, Cressey Bridge, and near the mouth, Tuolumne River at La Grange Bridge; Roberts Ferry Bridge, Hickman-Waterford Bridge, Modesto and Tuolumne City; Stanislaus River at Orange Blossom Bridge, Riverbank (Burneyville Bridge), Ripon and Bret Harte Pump. For a majority of the stations maintained by the Division of Water Resources in cooperation with various irrigation districts, et al., the records have been compiled on an annual basis.

Sacramento River at Sacramento

The record of the flow of the Sacramento River at Sacramento for the periods of low flow as given in this and previous reports, does not represent actual measurements at a station below the City of Sacramento intake. Because of tidal action during periods of low flow, a gaging station at this point is not maintained. The daily discharge record as given has been computed for the periods of low flow by using the Verona record and making due allowance for the measured inflow and draft between that station and Sacramento. When the flow is above 25,000 cubic feet per second at a staff gage reading of about 10.0 (13.1 U.S.E.D. datum) the effect of the tidal influence is lost and a direct ratio between gage height and discharge is used to determine the daily flow. In this computation it is not practicable and no attempt has been made to allow for the time required for the flow to travel from Verona to Sacramento and to make the various deductions and additions enroute at the exact time that the given Verona flow would have passed the respective points of inflow or draft. During the summer period velocities between Verona and Sacramento are low and a given flow may require a day's time or more to travel this distance. Under these conditions the computed flow at Sacramento may differ somewhat from that which would have been found if the actual flow could have been measured. Contributing to this difference also, there are the accretions or losses which cannot be measured. In the upper sections of the river the invisible accretions or losses between two points are susceptible of computation as the remaining quantity required to satisfy the equation when the flow at the upper and lower points and all definite intermediate inflows and drafts are known. With no actual measurement of the flow at Sacramento, the invisible accretions or losses between Verona and Sacramento cannot be thus defined and hence they are

unaccounted for in the computed flow at Sacramento. From the data presented subsequently in Chapter IV, it appears that some return flow might be expected in the Verona-Sacramento section, but as indicated in the tabulation of return water (Table 80) no figure for it has been given (except for the measured drains - Table 79), because it could not be derived without a record of the actual flow at Sacramento.

Table 4 is given to show the water surface elevation which could be expected to occur at various points on the Sacramento River for stream flows from 1000 to 10,000 cubic feet per second. These elevations are based on data obtained during 1941, and are subject to changes from year to year should the channel show any scour or fill at the control points. Table 5 gives, for the period March to October 1941, the average water surface elevations at various points on the Sacramento River for 15-day periods. This is the information used to determine the seasonal pumping heads for the various Sacramento River pumping plants. Tables 6 to 20, inclusive, list in downstream order discharge records for the Sacramento Valley stream flow stations while similar data for the San Joaquin Valley stations are given in Tables 21 to 42.

TABLE 4

ELEVATION OF WATER SURFACE AT VARIOUS POINTS ALONG SACRAMENTO RIVER FOR DIFFERENT DISCHARGES

Station	Elevation of Zero of Staff Gage U.S.E.D.	July 1939 Av.W.L. U.S.E.D	July 1939 Av. Disch. c.f.s.	July 1941 Av.W.L. U.S.E.D	July 1941 Av. Disc. c.f.s.	U.S.E.D. Elevation of Water Surface* 1000 c.f.s.	2000 c.f.s.	3000 c.f.s.	4000 c.f.s.	5000 c.f.s.	6000 c.f.s.	7000 c.f.s.	8000 c.f.s.	9000 c.f.s.	10000 c.f.s.
Sacramento	3.10	5.3	982	7.4	8910	Flows under 10000 c.f.s. will have no appreciable effect on average gage heights due to tidal action. Tidal effect lost at elevation 13.0. Flow 25000 c.f.s.									
Verona	0.0	7.6	1281	12.6	7860	7.5	8.0	9.0	9.9	10.8	11.5	12.4	12.8	13.6	14.1
Knights Landing	0.0(1)	9.4	997	16.1	4400	10.0	12.0	14.0	15.8	17.0	17.7	18.7	(4)20.1	(4) 21.4	(4) 23.5
Wilkins Slough	0.0	19.0	920	23.9	4130	19.4	21.5	23.1	24.8	26.2	27.6	29.0	30.3	31.6	33.0
Colusa	0.0(2)	36.5	1660	41.2	5020	36.0	37.4	39.2	40.2	41.2	42.1	42.9	43.8	44.7	45.6
Butte City	0.0	68.9	1620	72.4	4970	67.5	69.9	71.0	71.8	72.5	73.0	73.4	73.9	74.3	74.7
Red Bluff (Iron Canyon)	252.0	252.4	(3)3150	253.8	6110	-	-	252.3	252.9	253.4	253.8	254.2	254.6	254.9	255.3
Kennett	623.0	624.1	3096	625.6	5180	-	-	624.0	624.8	625.5	626.1	626.6	627.1	627.6	628.1

* Elevations are subject to variation because of channel changes due to scour or fill. Figures given are based upon data obtained in 1941.

(1) Weather Bureau gage 0^{o}_{o} = 7.6 U.S.E.D.

(2) Weather Bureau gage 0^{o}_{o} = 40.4 U.S.E.D.

(3) Average flow during August 2926 c.f.s.

(4) When discharge at Knights Landing exceeds 5000 c.f.s. there is usually some backwater effect. Elevations as given take backwater into account.

TABLE 5

1941 (MARCH TO OCTOBER) AVERAGE WATER SURFACE ELEVATIONS AT VARIOUS POINTS ON SACRAMENTO RIVER
FOR BI-MONTHLY PERIODS
ELEVATIONS ARE U.S.E.D. DATUM

Station	Miles above Sacramento	Month and Period																Of Staff Gage U.S.E.D. Datum
		March		April		May		June		July		August		September		October		
		1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	
Sacramento	0	26.8	20.4	25.5	22.3	23.8	21.7	14.6	10.2	8.1	6.8	6.0	5.8	5.9	6.1	6.1	6.5	3.10
Conaway Ranch	12.0			NO RECORD				19.1	15.1	12.5	10.8	9.4	9.1	9.4	N.R.	NO RECORD		0.0
Verona	19.6	35.2	28.8	34.3	30.6	31.3	28.9	21.4	16.5	13.7	11.6	10.3	9.9	10.1	11.1	11.6	12.0	0.0
Knights Landing	34.0	37.6	33.2	37.0	34.5	34.7	32.1	25.1	20.6	17.3	14.9	13.6	13.4	13.6	15.0	15.6	16.2	0.0
State Ranch Bend	40.6	39.9	35.9	39.4	37.1	37.0	34.0	27.0	22.3	18.7	15.9	14.5	14.2	14.5	16.1	16.9	17.6	0.0
Rough and Ready	44.0	41.2	37.3	40.7	38.4	38.3	35.0	28.1	23.3	19.6	16.8	15.4	14.9	15.4	16.9	17.9	18.6	0.0
Wilkins Slough	62.9	47.8	45.1	47.8	45.9	45.8	41.3	34.8	30.1	26.2	23.6	22.4	22.0	22.4	23.6	24.9	25.9	0.0
R. D. 70 Drain	68.8	51.9	47.2	52.0	48.6	48.5	43.8	37.3	32.5	28.4	25.9	24.6	24.3	24.9	25.5	26.9	27.9	0.0
Meridian	79.8	58.4	52.0	58.7	53.4	53.0	47.7	42.6	38.6	36.4	34.7	33.4	32.6	32.9	33.3	33.7	34.9	0.0
Colusa	89.4	63.7	55.9	64.1	57.3	57.3	51.8	47.1	44.1	42.0	40.3	39.5	39.3	39.3	39.7	40.0	40.8	0.0
Butte City	115.8	87.0	79.5	88.1	80.1	79.5	77.5	75.2	73.8	72.8	72.0	71.4	71.0	71.1	71.4	71.5	72.0	0.0
M. & T. Inc.	141.5	127.5	121.3	128.1	121.6	121.8	119.9	118.7	117.7	116.9	116.3	115.6	115.3	115.1	115.1	NO RECORD		4.2
Gianella Br.	150.0	139.9	133.7	140.4	133.8	134.3	132.4	NO RECORDS										127.9
Glenn Colusa I.D.	154.8	149.1	143.3	149.8	143.3	143.5	144.4	142.9	143.1	141.8	142.4	141.8	141.6	141.8	142.4	142.8	143.5	3.1
Red Bluff	193.4	255.4	249.2	256.1	249.2	249.8	248.2	246.7	245.9	244.9	244.3	243.9	243.7	243.6	243.3	243.2	243.6	240.6
Iron Canyon	198.6	263.8	258.0	264.4	257.8	258.3	256.9	255.7	254.8	254.1	253.6	253.3	253.2	253.1	253.1	253.1	253.3	252.0

TABLE 6

DISCHARGE OF SACRAMENTO RIVER AT KENNETT - 1941

Day	Daily Discharge in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	12400	14400	62600	30400	12000	9780	6180	4650	4070	4120	4140	5190
2	10400	12700	50900	30400	12100	9380	6090	4420	4320	4020	4240	14400
3	10400	12200	41200	34400	14100	9340	5990	4200	4270	3950	4340	20000
4	9680	11800	34100	66400	15700	9300	5930	4230	4240	3750	4670	9870
5	9460	11300	28300	48800	17800	9270	5780	4580	4210	3630	4530	7860
6	11900	14900	23800	32400	16900	8920	5740	4560	3980	3720	4420	6730
7	18400	15400	20800	26300	15100	8820	5620	4470	3800	4010	4240	6090
8	22800	20900	18600	22100	14800	8400	5530	4470	3880	4020	3940	5620
9	18400	32800	17100	21900	14200	8160	5650	4210	4140	4020	3920	5530
10	15400	37600	16100	22300	13400	8060	5800	4040	4140	4060	4110	5580
11	13600	53000	15200	20100	13900	8160	5420	4060	4160	3860	4370	5410
12	12200	45900	14400	18300	15100	8140	5100	4400	4150	3810	4250	5280
13	15400	36100	13900	17000	14400	8180	5030	4460	4070	3880	4210	8010
14	30000	28400	13500	16100	13300	7940	5130	4440	3850	4110	4850	21100
15	26000	23300	12800	15700	12500	7520	5360	4360	3880	4080	4920	40600
16	23300	20000	12200	14900	12200	7300	5160	4040	3880	4070	4750	63600
17	19100	18100	12000	14000	12400	7000	5060	3950	4140	4060	4440	33600
18	16100	17100	12000	13100	11800	7290	4920	4200	4180	3920	4460	40100
19	17900	16300	11500	12400	10700	7300	4840	4440	4290	3750	4370	36200
20	18900	15200	11100	11800	10400	6930	4750	4370	4010	3920	4320	32700
21	21000	14500	10700	12300	10500	6670	4820	4340	3750	4150	4290	23500
22	33900	13900	10400	12200	11100	6510	4910	4250	3930	4140	4080	18700
23	40600	14600	10200	11800	11500	7020	4910	4060	4180	4060	3900	16000
24	42500	19800	9960	11700	11600	7660	4850	3970	4140	4110	3930	13900
25	59100	19100	9780	11400	11000	7630	4720	3890	4030	3850	4160	12100
26	55700	17500	9650	11400	10800	6890	4450	4270	4020	3840	4180	11200
27	34100	20400	9580	11400	10300	6620	4290	4240	3860	4540	4180	10700
28	25200	45700	9820	11400	9850	6440	4500	4190	3760	4540	4200	10800
29	20200		11700	12300	10500	6330	4750	4330	3810	4370	4460	11500
30	17400		23300	12900	10200	6220	4640	4270	4080	4290	6040	11200
31	15600		39100		10100		4600	4060		4290		10300
Mean	22490	22250	19240	20250	12590	7773	5178	4272	4041	4030	4364	16380
Ac.Ft. for Month	1383000	1236000	1183000	1205000	774000	462500	318400	262700	240400	247800	259700	1038000

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey.

TABLE 7

DISCHARGE OF SACRAMENTO RIVER NEAR RED BLUFF - 1941

Day	Daily Discharge in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	20600	23400	129000	57100	17300	13500	7560	5210	4500	4480	5260	7940
2	17700	21900	101000	58000	16600	12700	7480	5210	4640	4460	5590	14300
3	15500	18600	84900	52900	19700	12300	7320	4890	4810	4430	5800	43000
4	15600	17900	77600	114000	20900	12100	7210	4760	4680	4340	6200	18900
5	20400	16800	55400	102000	23500	12000	7080	4870	4660	4130	5890	12200
6	28500	23400	44000	59800	23900	11700	6930	5080	4600	4110	5590	9840
7	44600	28100	37700	44800	21300	11400	6880	5040	4260	4240	5340	8590
8	45600	37300	32800	37300	20300	11000	6640	5000	4200	4460	5120	7640
9	35100	64400	29300	35500	20000	10500	6520	4950	4300	4460	4850	7140
10	26600	89800	26900	39000	18800	10300	6720	4700	4480	4480	4870	7060
11	22000	114000	25200	36400	18400	10200	6600	4600	4520	4540	5080	6980
12	19200	90700	23600	30300	19600	10300	6270	4660	4520	4380	5210	6720
13	22300	63400	22300	27400	20600	10300	5960	4930	4520	4440	5120	7080
14	67000	49000	21300	25400	19800	10200	5910	4930	4420	4500	5260	28900
15	47200	40400	20200	24100	18000	9810	5890	4830	4260	4660	6150	45400
16	42800	35800	19100	23000	17000	9350	6200	4740	4320	4660	6170	80000
17	32900	32100	18400	21600	16700	9090	5980	4440	4460	4660	5980	63700
18	26700	36000	18100	20100	16500	8900	5860	4480	4480	4620	5540	61600
19	35600	31700	17600	19000	15200	9320	5750	4680	4700	4400	5430	60600
20	44300	27400	17000	18000	14200	8980	5520	4810	4720	4340	5300	53400
21	43000	25700	16200	17400	14000	8540	5540	4720	4380	4540	5260	39300
22	52900	25300	15500	17800	14300	8270	5590	4700	4200	4720	5150	29600
23	74000	28600	15100	17000	14900	8400	5640	4600	4440	4760	4870	28300
24	80700	40000	14700	16800	15200	8760	5640	4380	4640	4660	4810	23100
25	76600	33000	14300	16400	15000	9950	5500	4320	4560	4660	4910	19900
26	109000	29300	14100	16200	14600	9260	5370	4380	4480	4600	5040	18200
27	65400	36800	13900	16200	14300	8590	5080	4640	4460	5300	5040	17700
28	45000	85300	13900	16100	13500	8210	5020	4600	4240	5770	5080	25300
29	35300		16500	16300	13800	7920	5230	4600	4180	5610	5820	32800
30	29400		24400	18700	14100	7700	5280	4720	4280	5370	8540	24600
31	25400		71800		13800		5260	4620		5210		19200
Mean	40870	41650	33930	33820	17280	9985	6111	4745	4464	4645	5476	26740
Ac. Ft. for Month	2513000	2313000	2086000	2012000	1063000	594100	375700	291700	265600	285600	325800	1644000

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located near the Iron Canyon damsite, Mile 198.6 above Sacramento.

TABLE 8

DISCHARGE OF SACRAMENTO RIVER AT BUTTE CITY - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1	33600	36600	129000	102000	25400	14300	6710	3880	3120	3560	5330	9200
2	28500	33400	147000	102000	24700	13700	6490	3780	3040	3840	5330	8720
3	24700	30800	134000	94000	24300	13400	6490	3690	3040	3840	5540	23100
4	22600	27700	126000	95000	25400	12500	6270	3780	3120	3930	5540	39600
5	22900	25800	122000	133000	26200	12200	6270	3320	3120	3740	5750	19400
6	28100	25800	100000	135000	27700	11900	6050	3500	3120	3650	5970	12800
7	64800	35600	73100	105000	28100	11600	5830	3320	3040	3560	5750	10300
8	85000	40100	58300	76000	26600	11300	5830	3320	2800	3560	5540	9040
9	76000	66400	49600	59800	25800	11100	5620	3320	2800	3930	5330	8090
10	51400	104000	43300	58300	25400	10800	5410	3240	2660	3930	5220	7400
11	36600	132000	38100	63100	24700	10500	5290	3060	2800	3930	5220	7170
12	29600	147000	36100	56900	24300	10300	5180	2900	3040	4120	5220	6940
13	26900	131000	33800	47200	24700	9780	5080	2820	3040	3930	5330	6710
14	59100	109000	32100	42200	25400	9530	4980	3060	3040	4120	5330	12300
15	99000	84000	30800	39100	24300	9280	4660	3150	3040	4120	5330	38100
16	84000	66400	29200	37100	22900	9040	4760	3150	3040	4310	5750	65600
17	63100	58300	28100	35200	22200	8800	4870	2980	3040	4310	6190	96100
18	47200	55500	26900	33400	21800	8560	4660	2740	3040	4310	6190	92000
19	38600	63100	26600	31200	21200	8320	4560	2740	3120	4310	5750	87000
20	67500	52000	25800	29600	19800	8090	4360	2820	3380	4120	5750	87000
21	75000	44900	24300	28100	18800	7860	4360	2980	3560	4120	5540	71100
22	86000	43300	23600	26900	18400	7630	4260	2960	3300	4220	5540	49600
23	89000	42800	22900	26200	18400	7400	4260	2960	3210	4310	5540	35600
24	105000	44900	21800	25400	18400	7400	4160	2960	3380	4310	5220	33000
25	110000	56900	21500	24700	18400	7170	4160	2800	3560	4310	5020	27300
26	107000	49000	20800	24300	18100	8090	4160	2660	3740	4310	5330	24000
27	123000	44900	20400	24300	17100	8090	4070	2660	3740	4700	5540	21800
28	109000	82700	20400	24000	16500	7630	3880	2880	3840	5120	5750	25800
29	76000		21200	23200	15200	7400	3780	2880	3650	5540	5970	50200
30	56900		25800	23600	14900	6940	3780	2880	3560	5540	6850	52000
31	44400		34800		14900		3880	3120		5330		34700
Mean	63570	61920	49910	54190	21940	9687	4972	3107	3202	4224	5589	34700
Ac.Ft. for Month	3909000	3439000	3069000	3225000	1349000	576400	305700	191000	190500	259700	332500	2125600

NOTE: Station is maintained jointly by the Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. Station is near Butte City bridge and is at mile 115.8 above Sacramento.

TABLE 9

DISCHARGE OF SACRAMENTO RIVER AT COLUSA - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	30800	30600	40700	36200	22600	14500	7100	3700	3300	3800	5390	8250
2	28300	29400	44100	38900	22500	14300	6870	3700	3200	3900	5610	9170
3	25500	28700	44100	37600	21700	13800	6760	3600	3100	4010	5950	12600
4	22900	26800	42800	37400	22900	13200	6520	3500	3300	4010	6300	27800
5	21800	25200	42300	40400	24400	12700	6410	3300	3300	3900	6760	26400
6	25800	24100	39900	43300	26200	12400	6300	3200	3200	3800	6520	18800
7	31600	28200	36600	41000	27300	12200	6060	3300	3200	3700	6180	14300
8	36900	31200	34400	36900	26100	11700	5950	3400	3100	3700	5840	11800
9	36600	34400	32700	34400	24500	11400	5720	3300	2800	3900	5720	10400
10	34800	37800	31200	33500	24000	10800	5500	3300	2700	4010	5500	9400
11	32000	41500	30200	34600	22800	10400	5500	3200	2900	4010	5280	8940
12	29600	44600	29400	34200	22000	10200	5500	3100	3000	4110	5390	8600
13	27600	44300	28700	32400	22600	10200	5280	3000	3100	4110	5500	8250
14	30400	41700	28000	31000	23500	10100	4950	3100	3100	4110	5500	8820
15	38100	38100	27300	30000	23700	9980	4740	3200	3100	4110	5390	21600
16	38400	35500	26600	29400	22200	9740	4740	3200	3100	4320	5840	32900
17	36200	33900	25500	28900	20800	9280	4840	3200	3100	4420	6520	36200
18	33900	33300	24500	28000	20100	8940	4630	3100	3100	4420	6520	37800
19	31800	34200	23800	27000	19500	8710	4530	2900	3200	4420	6060	36600
20	33700	33700	23100	25800	18400	8710	4420	2900	3400	4420	5840	37100
21	37100	31800	22400	24200	16900	8600	4320	3000	3600	4220	5720	36200
22	37100	31200	21600	23000	16100	8140	4110	3100	3500	4320	5610	34400
23	38600	31000	20900	22800	15800	7900	4110	3100	3300	4530	5500	31600
24	39400	31400	20300	22200	16200	7790	4110	3100	3400	4530	5390	30600
25	41200	33500	19800	21800	16500	8020	4010	3000	3600	4530	5170	29000
26	40700	33300	19300	21600	16500	8480	3900	2900	3800	4530	5170	26600
27	42000	31800	18800	21600	16200	8600	3900	2800	3800	4740	5280	24500
28	41500	34400	18500	21500	15800	8140	3800	3000	3800	4950	5280	24400
29	37600		18400	21100	15000	7680	3600	3100	3800	5500	5390	31600
30	34400		21200	20900	14500	7330	3600	3100	3700	5610	5950	34800
31	32200		28300		14700		3700	3200		5500		32000
Mean	33820	33410	28560	30050	20390	10130	5015	3181	3287	4327	5736	23272
Ac.Ft. for Month	2080000	1856000	1756000	1788000	1254000	602900	308400	195600	195600	266100	341300	1430900

NOTE: Station is maintained jointly by the Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. Station is at Colusa Bridge and is at mile 89.4 above Sacramento.

TABLE 10

DISCHARGE OF SACRAMENTO RIVER BELOW WILKINS SLOUGH - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	21400	21200	22000	21400	19700	13800	6260	2870	2690	4060	5830	6990
2	21000	21000	22400	21800	19900	13700	6040	2810	2750	4120	5830	8920
3	20700	21000	23100	21900	19700	13200	5750	2930	2620	4190	6110	9820
4	20300	20800	23300	21900	19900	12700	5610	2870	2690	4190	6550	18300
5	20000	20600	23000	22000	20100	12300	5470	2620	2750	4190	6840	21000
6	20400	20300	22500	22500	20400	11900	5330	2500	2750	4060	6990	19500
7	21100	20500	22000	22600	20600	11700	5180	2440	2750	3930	6700	15600
8	21800	21000	21700	22100	20500	11400	4970	2620	2620	3930	6400	13200
9	21800	21400	21400	21700	20300	11100	4760	2560	2380	4060	6190	11600
10	21700	21800	21300	21500	20200	10600	4620	2500	2260	4190	5970	10500
11	21400	22000	21100	21600	19900	10200	4470	2560	2260	4190	5680	9750
12	21100	22700	21000	21600	19800	9750	4470	2440	2440	4190	5610	9220
13	21000	23700	20900	21400	19900	9600	4330	2320	2560	4190	5680	8850
14	21000	23300	20900	21200	20100	9520	4060	2260	2620	4190	5750	8780
15	21800	22400	20800	21100	20000	9450	3860	2440	2620	4190	5680	15200
16	22000	21900	20700	21000	19900	9220	3740	2500	2690	4260	5830	21200
17	21800	21600	20500	21000	19400	8920	3800	2440	2690	4400	6330	21700
18	21600	21500	20400	20900	19200	8550	3800	2380	2690	4470	6700	22000
19	21300	21500	20300	20700	18900	8320	3670	2200	2810	4540	6480	22000
20	21400	21500	20100	20500	18000	8250	3550	2080	2930	4620	6190	22000
21	21800	21300	19900	20400	16900	8250	3490	2140	3180	4470	5970	22000
22	21800	21200	19800	20100	15900	7880	3360	2320	3360	4400	5830	21800
23	22000	21200	19500	19900	15300	7580	3300	2380	3240	4540	5750	21500
24	22000	21200	19300	19900	15500	7280	3240	2440	3180	4760	5680	21300
25	22100	21300	18900	19700	15700	7210	3180	2380	3430	4760	5540	21100
26	22100	21400	18500	19700	15800	7360	3120	2320	3740	4690	5470	20900
27	22300	21300	18100	19600	15500	7800	3120	2200	3930	4970	5470	20500
28	22400	21400	17700	19500	15200	7500	2990	2200	3990	5180	5540	20400
29	22000		17700	19400	14700	6990	2810	2440	4060	5540	5610	21100
30	21700		18800	19400	14000	6620	2750	2500	4060	5970	5830	21700
31	21400		20400		14000		2810	2560		5970		21500
Mean	21490	21500	20580	20930	18220	9622	4126	2459	2958	4497	6001	17095
Ac. Ft. for Month	1321000	1194000	1265000	1246000	1120000	572500	253700	151200	176000	276500	357100	1051100

NOTE: Station is maintained jointly by the Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. Station is located at mile 62.9 above Sacramento, a short distance below Wilkins Slough pumping plant of Reclamation District 108.

TABLE 11

DISCHARGE OF SACRAMENTO RIVER AT KNIGHTS LANDING - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	22500	22200	21700	22600	19800	13800	7030	3030	2970	4480	6260	6750
2	22100	22300	22100	22700	20200	13400	6620	3000	3090	4500	6120	8990
3	21900	22300	23800	21800	20000	13100	6360	2980	3070	4610	6270	9570
4	21700	22200	24900	22000	19700	12500	6150	3030	2980	4600	6680	17200
5	21400	22200	24400	21300	20100	12200	6010	2990	3030	4630	7050	22600
6	22000	22100	23600	22700	20500	11800	5711	2770	3040	4320	7480	21100
7	21800	22300	22800	23400	20700	11800	5520	2660	3010	3980	7200	17700
8	22000	23300	22600	22800	20900	11500	5280	2730	2920	3910	6630	14600
9	22700	23200	22400	22500	20500	11300	5100	2800	2780	3970	6440	13100
10	22700	22200	22000	22000	20300	11100	4880	2740	2590	4080	6180	12000
11	22700	21300	21800	22000	20200	10400	4780	2740	2540	4170	5800	10800
12	22500	21500	21700	22100	19800	9930	4740	2730	2640	4140	5580	10100
13	22400	24800	21600	22000	19700	9790	4640	2640	2920	4180	5620	9390
14	21200	25300	21600	21700	19400	9890	4350	2570	3120	4140	5720	9190
15	22300	23700	21400	21600	19800	9770	4230	2710	3050	4180	5710	13400
16	22600	22500	21400	21400	19900	9670	3950	2850	3110	4200	5810	21400
17	22800	22400	21600	21400	19400	9380	3840	2770	3070	4300	6280	21700
18	22500	22200	21400	21400	19400	9110	3980	2710	3170	4370	6720	23300
19	22600	22100	21300	21400	19200	8840	3870	2690	3310	4460	6690	22500
20	22700	22000	21200	21500	18800	8690	3860	2570	3360	4460	6300	22700
21	23100	21700	21100	21400	17000	8660	3650	2510	3630	4490	6130	22900
22	22400	21300	20800	21200	15700	8390	3520	2640	3750	4360	5930	22900
23	22600	21500	20500	21000	14900	8080	3360	2710	3790	4450	5830	22700
24	22700	21500	20300	20500	14900	7880	3370	2790	3740	4580	5730	22700
25	22900	21500	20100	20500	15200	7810	3290	2770	3760	4680	5580	22700
26	22700	21900	19700	20200	15300	7990	3170	2780	4010	4770	5460	22500
27	22700	21800	19200	20300	15400	8610	3150	2700	4320	4950	5360	22300
28	23300	21900	18900	20100	15100	8420	3120	2630	4690	5230	5480	21800
29	23200		18500	20000	14600	7860	3020	2720	4630	5600	5550	21600
30	22900		19300	19700	14200	7290	2970	2890	4600	6330	5650	22600
31	22600		21300		14000		2950	2890		6330		22900
Mean	22458	22328	21452	21507	18213	9965	4402	2766	3356	4563	6108	17925
Ac. Ft. for Month	1380900	1240100	1319000	1279700	1119900	593000	270700	170100	199700	280600	363400	1102200

NOTE: Station is maintained jointly by the Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. It is located at the Knights Landing Railroad Bridge, mile 34.0 above Sacramento, below the point of discharge to the river of Colusa Basin drainage via the Back Borrow Pit of Reclamation Districts 108 and 787.

TABLE 12

DISCHARGE OF SACRAMENTO RIVER AT VERONA - 1941

Day	Daily Discharge in Second-foot											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	58800	56600	58000	43400	42300	31500	11100	5060	4460	6730	8410	9300
2	56600	55400	61400	50100	42800	30500	10700	4930	4420	6660	8770	11700
3	54800	54400	65500	57200	43800	29700	10100	5040	4440	6630	9570	13800
4	53300	53400	66500	58500	44600	28800	9910	4900	4460	6660	10200	30800
5	51900	52100	65500	60700	46200	27600	9730	4680	4570	6700	10500	38400
6	50700	50200	64300	62900	47600	26400	9040	4580	4620	6390	10200	36400
7	52500	49200	62500	63900	50100	25200	8540	4460	4720	6030	9800	31300
8	55200	48700	60400	62800	51400	24900	8540	4480	4340	5900	9220	25700
9	56400	50200	58800	60600	51200	23300	8970	4480	4320	5990	9210	21000
10	56800	54500	57500	58900	51200	22000	9570	4220	3840	6070	8650	18000
11	56300	58500	56500	58100	50900	21400	9690	4420	3720	6140	8170	16200
12	55300	65600	55700	57400	50400	21400	9600	4260	3720	6240	7960	14900
13	54300	68600	55000	56800	50900	21200	9660	4210	3840	6090	7800	15100
14	55200	67000	54400	55900	52800	20800	8900	4220	4080	5920	7910	16200
15	56000	64400	53900	55200	53900	20500	8400	4260	4200	6070	7930	24500
16	57600	62200	53300	54600	53500	19100	8120	4300	4370	6100	8120	39600
17	58200	60200	52400	54300	52200	17900	7770	4370	4510	6140	8340	52000
18	57700	58900	51400	53800	51300	17100	7670	4030	4700	6280	8950	57600
19	56600	57900	50500	53200	50400	16200	7660	4010	4800	6350	9060	59600
20	55800	57500	49400	52300	48500	15300	7590	3910	4920	6450	8810	59400
21	55700	56900	47900	51100	45600	15000	6830	3850	5340	6350	8330	59200
22	57200	56800	46000	49400	42700	14900	6300	3900	5320	6320	8070	58600
23	57900	56400	44000	47300	40900	13900	6210	4040	5570	6380	8070	57500
24	58700	56100	41900	45700	40000	13600	6070	4310	5650	6480	7880	56200
25	59300	56200	39800	44400	39800	13500	5730	4060	5900	6580	7510	55000
26	60900	56400	37800	43400	39700	13700	5540	4080	6280	6630	7400	53700
27	62600	56400	36300	42900	39000	13900	5600	4000	6460	6840	7370	52100
28	62600	56300	35100	42500	38000	13400	5150	3940	6840	7260	7420	51900
29	61800		34700	42200	36400	13100	4950	4000	6600	7910	7610	53900
30	60000		35800	42200	34300	11900	4960	4180	6660	8260	8090	55000
31	58200		39200		32400		5080	4550		8300		55000
Mean	56930	57040	51340	52720	45640	19920	7061	4314	4922	6544	8511	38700
Ac. Ft. for Month	3501000	3168000	3156000	3137000	2806000	1186000	483300	265200	292900	402300	506400	2379000

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Mile 19.6 above Sacramento at the mouth of "Cross Canal" main drain of Reclamation District 1001, and below the mouth of the Feather River.

TABLE 13

DISCHARGE OF SACRAMENTO RIVER AT SACRAMENTO - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	63200	60500	67000	45800	49400	36200	13100	5410	4580	7160	9050	10200
2	60500	58700	76000	52700	49400	36200	12700	5240	4530	7140	9680	12900
3	58100	57200	80000	59600	50000	35900	12100	5330	4580	7070	13600	22900
4	56000	56000	80000	64100	51500	35300	11900	5080	4720	7060	12900	38800
5	54200	54800	79500	75500	55400	34100	11600	4870	4850	7020	12300	39900
6	53600	53000	76000	73000	59600	33800	10800	4820	4870	6650	11600	38200
7	56600	51800	72000	72000	60200	32700	10200	4670	4970	6340	10900	33600
8	62000	50900	68200	70500	60500	31000	10200	4720	4480	6310	10200	28000
9	60800	55100	65400	67800	60800	29500	10500	4720	4470	6390	10100	23200
10	59900	60500	63800	66600	61400	27500	10900	4470	4090	6480	9470	20300
11	59000	75000	62600	65400	60800	26600	10900	4570	4040	6560	8940	18400
12	57800	83900	61400	63800	61400	26600	10700	4440	4020	6570	8670	16600
13	56900	82700	60500	62300	63500	26600	10800	4440	4070	6410	8600	16600
14	61400	80500	60200	61400	65000	26000	9910	4490	4260	6290	8700	18600
15	63500	76500	59300	60800	63500	25200	9410	4540	4320	6510	8690	25700
16	63200	72500	58100	60800	62300	24300	9060	4540	4530	6570	8910	46100
17	62300	67800	56900	60200	61700	22600	8640	4630	4770	6580	9270	60200
18	61100	66200	56300	59000	61700	21000	8460	4250	4960	6730	10100	62000
19	60200	65000	55400	57800	59300	19800	8410	4160	5170	6790	10200	62600
20	59300	63500	54500	56900	56600	19100	8210	4170	5290	6830	9780	62900
21	58100	64700	52400	55400	53900	18900	7360	4070	5530	6790	9210	62900
22	59600	65400	50300	54200	53000	18400	6830	4100	5600	6910	8860	62000
23	61400	63200	48200	52400	52100	16900	6780	4220	5730	7020	8860	60500
24	62600	62600	46100	51500	51200	16500	6570	4480	5890	7060	8670	59300
25	64400	62600	44000	50300	49400	16100	6180	4180	6270	7140	8260	57500
26	68200	62300	42000	50000	49100	15900	5990	4190	6660	7120	8190	56000
27	71500	61700	40500	49400	48500	16100	6090	4240	6820	7290	8180	54500
28	68600	62000	40200	49400	46400	16300	5520	4130	7160	7950	8240	54500
29	67000		39400	49100	44600	15300	5320	4230	6910	8680	8390	58400
30	64400		39900	49700	41700	13800	5440	4400	7070	8960	8900	59900
31	62300		42000		39100		5510	4780		8990		59600
Mean	61200	64200	58000	58900	54900	24500	8910	4530	5170	7010	9580	42000
Ac. Ft. for Month	3760000	3560000	3570000	3510000	3380000	1460000	548000	279000	308000	431000	570000	2580000

NOTE: This represents the flow of the Sacramento River past Sacramento (below the City of Sacramento intake) to the Delta. Additional water flows to the Delta via the East Borrow Pit of Yolo By-Pass. (see Tables 106 and 107). The discharges of this table have been computed as follows: January 1 to June 18 and December 3 to 31 by gage height discharge relation; balance of year based on flows at Verona and making due allowances for draft & measured return flow. A gaging station is not maintained at Sacramento during periods of low flow (below 8.0) because of tidal action.

TABLE 14

DISCHARGE OF FEATHER RIVER NEAR OROVILLE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	9880	9080	36900	14900	13100	11400	3600	2260	1850	1880	2180	3110
2	8100	8580	32000	15400	13600	11200	3570	2180	2100	1900	3890	10600
3	7380	8100	25900	15200	15500	10800	3330	2020	2070	1740	3060	26600
4	6900	7860	23300	28900	15100	10200	3030	2290	1960	1720	3010	9540
5	6700	7620	20500	21700	16200	8940	2790	2210	1960	1680	2470	5980
6	7700	8580	18100	16600	16100	7580	3180	2180	2020	1760	2330	4570
7	12000	8140	16500	15500	14700	7620	3360	2160	1770	1820	2340	3710
8	11400	9210	15300	14500	15300	6860	3180	2180	1950	1820	2260	3680
9	9660	15900	14800	14400	16100	6420	2940	2070	1920	1810	2050	3460
10	9030	43900	14700	14200	15700	6820	3090	1820	1890	1890	2520	3350
11	8500	70400	14300	13200	16400	7180	2940	2240	1880	1790	2120	3140
12	7820	43700	14100	12600	18700	6740	2760	2180	1840	1660	2300	3110
13	9210	28800	13800	12400	24400	6540	2620	2130	1770	2010	2070	3110
14	15500	22300	13000	12600	21900	6070	2680	2160	1790	1960	1820	12500
15	14200	19600	12100	12900	19200	5580	2730	2100	1910	1910	1950	33500
16	12600	18200	11500	13000	17800	5070	2650	1990	1830	1950	2420	50100
17	10800	16400	11500	12200	17200	5070	2700	1800	1840	1940	2280	28000
18	9660	16500	11900	11700	16700	4890	3060	2130	1830	1890	2210	23700
19	8850	15600	11800	11000	15200	4740	2700	2070	1860	1760	2150	20700
20	8670	16500	11400	10600	14600	4710	2290	1940	1770	1900	2060	17400
21	9340	16700	10600	10500	15000	4620	2540	2020	1810	1940	2010	14000
22	12600	16400	9930	10300	15000	4530	2480	2100	1850	1820	2170	12300
23	13100	15900	9680	10600	14900	4470	2400	1820	1900	1870	2000	11300
24	14100	17700	9370	11000	15000	4380	2380	1850	1950	1920	1960	9230
25	22500	16000	9200	11300	14300	4590	2350	1990	1880	1800	2030	7780
26	26100	14600	8970	11700	13900	4200	2380	1990	1930	1890	2040	6900
27	16900	15900	8960	12200	14000	3990	2130	1940	1740	2320	2020	7060
28	13900	24000	9260	12300	13300	4080	2380	1960	1680	2270	2200	9160
29	12000		11200	12400	12300	3780	2400	1910	1840	2110	2280	9300
30	11000		12800	12600	11800	3720	2380	1800	1930	1990	4270	8360
31	9930		15000		12000		2350	1910		1960		7440
Mean	11480	19010	14790	13610	15650	6226	2754	2045	1877	1893	2349	12020
Ac. Ft. for Month	706200	1056000	909200	810000	962000	370500	169300	125800	111700	116400	139800	739200

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey.

TABLE 15

DISCHARGE OF FEATHER RIVER AT NICOLAUS -- 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	28900	*19200	35000	20000	20200	15800	4050	1380	695	1560	2180	3570
2	*20700	*16800	49000	22800	20600	15100	3810	1300	722	1560	2400	3330
3	*15800	*15700	58000	*24400	21100	14900	3450	1260	722	1560	3500	7430
4	*14700	*14700	57000	*26600	23000	14500	3450	1140	840	1520	3570	20400
5	*14000	*13800	49000	46000	24000	14000	3330	1040	840	1470	3450	17700
6	*14900	*13600	42000	47000	25000	12900	3110	1140	780	1470	2780	*9700
7	*21200	*13700	40000	43000	26100	11800	3110	1110	780	1430	2720	*7500
8	28500	*13700	*34000	39000	25300	11800	3220	1070	750	1520	2620	6310
9	26000	*17100	*29200	*33000	24800	10800	4050	1040	645	1560	2500	5480
10	*20700	26000	*25500	*29500	25600	9890	4830	1000	670	1520	2400	5090
11	*17800	50000	*24000	*27600	25300	10100	4960	968	670	1470	2340	4960
12	*16200	81000	*22300	*24300	25900	10800	4830	810	670	1470	2340	4700
13	*15200	78000	*22000	*21600	28300	10800	4570	968	670	1470	2280	6030
14	*23300	61000	*21000	*20200	33500	10200	2310	968	695	1430	2280	7720
15	29500	47000	*20100	*19500	32700	9570	4050	870	645	1560	2230	16800
16	29200	38000	*19000	*19200	29500	8770	3810	750	620	1560	2230	29200
17	*26700	34000	*17400	*19800	27300	8020	3690	695	695	1520	2560	48000
18	*21900	31000	*18100	*18800	26400	7570	3450	670	750	1560	2620	42000
19	*19200	29200	*17900	*17700	25900	7010	3450	575	840	1560	2560	36500
20	*17500	27300	*18000	*16800	23500	6590	3000	620	902	1560	2450	33900
21	*16800	27300	*17700	*16200	21700	6310	2620	645	1000	1520	2230	*32000
22	*22000	29200	*16700	*16100	21500	6170	2230	620	968	1600	2180	*27200
23	*25200	28000	*16000	*16000	21900	6030	2180	670	1000	1560	2230	*22600
24	28800	27100	*16000	*16800	22300	5890	1980	722	1070	1520	2230	*19400
25	34000	28200	15600	*17700	22300	5750	1740	620	1380	1600	2080	*15800
26	41000	27300	15300	18300	21900	5750	1700	595	1470	1600	2180	*13000
27	49000	25700	14900	18500	21100	5350	1600	645	1520	1700	2180	*12100
28	41000	26200	14700	18800	20200	4960	1520	670	1520	2080	2130	*16200
29	35000		15300	19000	19000	4830	1340	670	1520	2340	2280	*24200
30	*28800		16900	19800	17500	4310	1520	695	1430	2180	2400	*24000
31	*22400		18500		16200		1470	695		2080		*17500
Mean	24706	30707	25681	23800	23858	9209	3111	859	916	1616	2471	17429
Ac. Ft. for Month	1519100	1705400	1579400	1416200	1467000	548000	191300	52800	54500	99400	147000	1071700
Diversions Below Nicolaus, Ac. Ft.	0	0	0	0	0	40	332	264	152	63	0	0
Discharge to Sacramento River, Ac. Ft.	1519100	1705400	1579400	1416200	1467000	548000	191000	52500	54300	99300	147000	1071700

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. Record from April 26 to Dec. 1 compiled by U.S.G.S. Balance of year by Water Supervisor. *indicates that gage heights were affected by back-water. Discharges were determined after making use of all available data.

TABLE 16

DISCHARGE OF YUBA RIVER AT SMARTVILLE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	5150	3820	14600	4680	6700	4600	1420	568	357	425	345	
2	4130	3550	13700	6320	6980	4740	1350	538	349	402	410	
3	3610	3270	11700	5620	8400	4660	1270	532	345	388	420	
4	3570	3070	11000	13400	8980	4420	1220	532	341	384	225	
5	3850	2900	9080	10600	9370	4350	1160	532	341	374	44	
6	3930	3340	7740	7450	10400	4330	1120	532	345	370	33	
7	8380	3320	6910	6850	9300	4630	1060	532	328	366	26	
8	6700	3670	6290	6160	8720	4120	1880	513	298	366	23	
9	5460	7320	5890	6350	10200	3700	2870	538	272	366	22	
10	4250	20800	5840	6530	9740	3680	3210	532	254	362	21	
11	3710	26600	5600	5780	10400	4410	3060	509	247	357	21	
12	3570	19200	5410	5340	12700	4540	2910	520	234	349	21	
13	4220	12300	5280	5170	17800	4400	2760	526	230	345	21	
14	7230	9300	5320	5380	14000	3920	2630	418	244	341	22	
15	6460	8220	4960	5500	10700	3790	2480	301	254	336	27	
16	5430	7700	4660	5680	9500	3150	2310	313	279	332	34	
17	4490	7110	4630	5260	9560	2760	2120	317	298	332	31	
18	3920	8300	4840	4840	10100	2370	1960	317	313	328	27	
19	3680	7200	4750	4560	7920	2160	1590	320	313	328	27	
20	3640	6480	4540	4330	6930	2060	1490	345	305	324	26	
21	3930	9670	4170	4310	7390	2040	1240	370	298	324	25	
22	4910	8600	3960	4350	8560	2060	1090	379	306	324	25	
23	6590	7450	3880	4560	9480	2010	933	397	400	309	23	
24	7360	8180	3740	4720	9430	1910	696	397	598	264	22	
25	10800	7340	3610	5060	9410	1930	785	397	520	298	6	
26	14700	6560	3610	5220	8880	1770	718	392	504	309	3	
27	9040	6370	3680	5350	7560	1840	675	392	482	341	3	
28	6690	8380	3740	5320	6700	1820	654	392	455	345	4	
29	5500		4230	6080	5900	1660	634	392	445	345	17	
30	4760		4570	6430	5200	1490	620	384	435	341	60	
31	4210		4280		5080		594	374		341		
Mean	5609	8215	6007	5907	9096	3177	1565	436	346	346	67	
Ac. Ft. for Month	344900	456200	369300	351500	559300	189100	96220	26780	20610	21250	3990	

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. This station discontinued as of November 30, 1941. Beginning December 1, 1941, for comparable record, add flow at Yuba River at Narrows Dam to flow at Deer Creek near Smartville. See Tables 16A and 16B.

TABLE 16A

DISCHARGE OF YUBA RIVER AT NARROWS DAM - 1941*

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1												0
2												0
3												4590
4												4750
5												2310
6												1630
7												1290
8												1120
9												992
10												992
11												956
12												2240
13												3400
14												1700
15												5970
16												24700
17												13000
18												8260
19												7730
20												7110
21												6010
22												4560
23												4150
24												3640
25												3400
26												3400
27												3400
28												3400
29												4390
30												4130
31												3520
Mean												4411
Ac. Ft. for Month												271200

*Combined flow, outlet works and spillway.

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. See footnote Table 16.

TABLE 16B

DISCHARGE OF DEER CREEK NEAR SMARTVILLE - 1941*

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1										1	16	23
2										1	73	130
3										1	48	711
4										1	43	102
5										1	33	60
6										1	27	74
7										2	23	77
8										4	23	78
9										5	21	78
10										4	21	58
11										4	21	84
12										5	21	83
13										8	21	98
14										4	21	994
15										3	23	1370
16										2	27	2130
17										3	26	464
18										4	25	406
19										3	24	278
20										2	24	280
21										4	24	234
22										6	24	187
23										5	23	304
24										3	20	199
25										3	6	183
26										6	4	183
27										15	4	535
28										15	6	1570
29										13	24	960
30										11	48	490
31										9		365
Mean										5	25	413
Ac. Ft. for Month										296	1480	25360

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the U. S. Geological Survey.

* See footnote Table 16.

TABLE 17

DISCHARGE OF YUBA RIVER AT MARYSVILLE (SIMPSON LANE BRIDGE) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1						4910	1350	383	210	310	294	
2						4790	1320	344	200	286	378	
3						4790	1180	332	190	278	405	
4						4550	1140	328	187	270	432	
5						4430	1080	324	190	266	194	
6						4550	1050	315	184	263	143	
7						4730	992	303	181	259	143	
8						4430	1210	299	159	266	123	
9						4070	2380	295	145	263	111	
10						3830	2990	311	131	259	105	
11						4310	2940	299	128	259	100	
12						4550	2770	311	124	256	96	
13						4490	2670	349	108	248	93	
14						4010	2520	340	108	245	88	
15						4010	2380	210	106	231	90	
16						3380	2190	178	108	228	88	
17						3040	2010	181	114	228	85	
18						2570	1800	174	137	228	84	
19						2280	1390	168	151	224	82	
20						2140	1320	178	151	221	78	
21						2010	1050	187	153	221	74	
22						2010	914	204	145	228	72	
23						1920	812	217	280	231	70	
24						1880	607	238	464	218	69	
25						1840	574	238	418	208	67	
26						1750	517	235	387	228	66	
27						1750	489	217	374	294	66	
28						1750	466	214	352	294	66	
29						1670	433	217	335	286	68	
30						1470	415	221	323	282	66	
31							392	217		278		
Mean						3264	1398	259	208	253	130	
Ac. Ft. for Month						194200	86000	15900	12400	15600	7730	

NOTE: Station is maintained jointly by the Division of Water Resources (Water Supervision) and the Water Resources Branch of the U. S. Geological Survey. Station is at 7th St. Bridge. Discharge record determined for low water season only. For balance of year see U.S.G.S. Station "Yuba River at Smartville" (Table 16).

TABLE 18

DISCHARGE OF AMERICAN RIVER AT FAIR OAKS - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	5620	4280	15000	5420	8690	6300	2380	596	309	475	618	1030
2	4420	4010	17100	7620	8850	6480	2390	564	297	447	1020	1140
3	3800	3830	14300	6020	10200	6640	2350	471	372	421	4180	22500
4	3460	3680	13200	12400	11400	6480	2320	439	491	368	2690	9790
5	3530	3550	11700	15200	12000	7110	2190	483	463	334	1770	4280
6	3780	3800	9760	9570	16600	7000	2090	499	404	282	1300	3090
7	9270	3880	8580	8320	13700	6050	1990	487	354	358	1070	2640
8	8630	3830	7800	7840	12000	5260	1980	547	279	396	948	2210
9	5840	5440	7400	7560	14200	4810	1800	491	315	400	872	1980
10	4620	13700	7300	8800	12900	4920	1680	447	435	404	801	1920
11	4080	26900	7320	7970	14100	5460	1510	428	447	379	812	1820
12	3750	22200	6840	7020	16900	5860	1370	439	390	309	725	1680
13	3880	14700	6810	6650	18000	5740	1310	507	334	306	828	1570
14	9980	10900	6880	6880	15400	5380	1270	503	270	393	801	2490
15	8520	9260	6220	7380	11500	4880	1240	531	261	475	770	6310
16	6960	8800	5780	7540	11000	4560	1180	414	303	515	823	17800
17	5400	7940	5820	6900	12300	4360	1110	503	390	463	954	12700
18	4450	9070	6390	6200	12400	4080	1030	400	475	471	1150	6840
19	4140	8270	6270	5660	9500	3860	960	418	337	424	1030	6860
20	3840	7360	5940	5130	8340	4270	828	487	344	379	930	6220
21	3580	12100	5260	5100	9260	4010	785	439	276	519	862	5780
22	3980	9720	4900	5600	11300	3610	785	414	270	650	801	4540
23	5070	8210	4770	6200	12400	3270	828	479	255	681	828	4200
24	6920	8780	4880	6640	11600	3020	755	358	344	564	780	4140
25	8160	8410	4800	7170	11200	2800	690	318	396	604	796	3570
26	12600	7460	4860	7600	10500	2530	686	421	379	520	834	3250
27	9620	6920	5210	8030	9140	2680	676	443	365	450	828	3300
28	7500	7480	5350	8160	8360	3040	618	447	324	660	790	5860
29	6000		5500	8740	7480	2440	676	463	330	725	801	7840
30	5100		5430	8410	6660	2280	710	410	421	672	856	7300
31	4690		5160		6340		690	390		609		5670
Mean	5845	8731	7501	7591	11430	4639	1319	459	354	473	1076	5494
Ac. Ft. for Month	359400	484900	461200	451700	702600	276100	81080	28240	21080	29060	64000	337800

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey.

TABLE 19

DISCHARGE OF AMERICAN RIVER AT SACRAMENTO - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1						6290	2250	632	325	455	666	
2						6400	2280	580	310	509	940	
3						6580	2210	520	350	482	4030	
4						6460	2230	450	487	440	2730	
5						6920	2070	487	509	360	1820	
6						6940	2010	520	465	288	1370	
7						6140	1910	509	405	325	1120	
8						5420	1900	538	310	405	972	
9						4880	1740	532	320	405	902	
10						4880	1630	498	400	410	842	
11						5380	1490	450	470	420	782	
12						5760	1360	455	445	330	730	
13						5700	1330	520	360	330	812	
14		(See footnote)				5370	1240	532	315	385	805	
15						4940	1250	532	284	470	775	
16						4600	1200	487	302	509	812	
17						4340	1120	509	405	487	940	
18						4060	1050	470	430	492	1120	
19						3820	996	395	425	476	1110	
20						4070	850	504	395	415	988	
21						4040	760	476	297	465	895	
22						3640	782	455	274	626	805	
23						3210	835	445	261	673	812	
24						3050	760	440	306	612	805	
25						2790	687	345	425	593	768	
26						2490	694	350	415	520	805	
27						2430	708	476	380	482	820	
28						3070	632	455	335	715	835	
29						2440	632	487	325	798	798	
30						2160	752	430	430	730	828	
31							701	435		645		
Mean						4610	1292	481	372	492	1080	
Ac. Ft. for Month						274300	79500	29600	22100	30200	64400	
Diversions Below Station						0	100	300	100	0	0	
Discharge to Sacramento River, Ac. Ft.						274300	79400	29300	22000	30200	64400	

NOTE: Station is maintained jointly by Division of Water Resources (Water Supervision) and the Water Resources Branch of the U.S. Geological Survey. Station is located at the "H" Street Bridge and is 6.0 miles above mouth of river. For period not covered by this record refer to station at Fairoaks (Table 18).

TABLE 20

DISCHARGE OF MOKELUMNE RIVER AT WOODBRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	569	730	1310	1190	446	3160	489	168	113	310	440	536
2	432	701	1920	1160	490	2620	682	311	124	293	470	574
3	574	695	2610	719	514	2400	808	204	189	327	416	545
4	607	693	3090	675	862	2060	784	82	180	428	476	528
5	624	693	3060	1770	1260	1210	750	74	228	416	512	583
6	596	697	2390	1500	1500	762	719	149	251	247	591	644
7	624	708	1790	1110	1760	1300	510	185	254	259	576	598
8	613	732	1630	899	1750	1760	524	200	175	291	550	336
9	574	800	1570	817	1560	1290	440	227	224	318	545	508
10	589	788	1440	803	1550	489	340	256	268	329	352	530
11	583	952	1370	827	1790	601	288	70	286	361	502	572
12	576	1590	1470	800	2000	1740	247	138	240	404	558	635
13	536	2100	1480	952	2260	2870	247	326	309	194	651	298
14	817	2400	1480	803	3420	3060	378	308	335	277	532	847
15	947	2650	1460	598	4180	2780	55	310	154	318	673	565
16	1280	2700	1450	798	4290	2820	67	331	226	350	583	539
17	1320	2110	1440	995	4160	2520	227	270	302	380	449	587
18	973	1870	1320	1030	4330	2500	194	77	284	432	524	633
19	884	1900	1290	1040	4420	2240	251	104	309	382	550	633
20	882	1800	1280	1040	4420	1940	265	244	418	169	602	638
21	752	1650	1240	1040	4440	2340	72	236	248	318	520	635
22	880	1540	1240	1030	4440	2040	79	263	107	390	602	635
23	954	1470	1240	701	3610	1680	120	287	190	361	618	644
24	983	1240	1220	554	2350	1420	138	263	262	464	434	640
25	901	1060	896	516	2240	1240	141	79	276	422	545	524
26	940	1160	750	504	2120	1000	180	116	345	382	520	341
27	964	1230	798	498	2230	816	260	236	388	253	530	607
28	959	1220	808	257	2650	802	114	205	398	372	615	642
29	949		812	80	2980	749	112	234	252	418	598	456
30	872		1080	384	3210	507	162	336	270	462	596	690
31	856		1160		3280		165	237		416		946
Mean	794	1353	1487	836	2597	1757	316	210	254	347	538	584
Ac. Ft. for Month	48810	75130	91430	49770	159700	104600	19450	12930	15080	21310	31990	35880

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located just below dam of Woodbridge Irrigation District.

TABLE 21

DISCHARGE OF SAN JOAQUIN RIVER BELOW FRIANT - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	1740	1580	6090	3060	5560	7280	6000	2080	1280	1170	754	1490
2	1510	1390	5640	3170	5740	8050	6980	1970	1190	1240	766	1490
3	1530	1500	4950	3020	6170	8900	7890	1970	1500	1180	778	2310
4	1650	1790	4560	3240	6890	9780	8560	1780	1470	1110	802	4110
5	1220	1740	4640	5530	7280	11100	7720	1880	1570	1230	820	2410
6	1260	2250	2590	3480	9050	13000	7580	1880	1470	992	834	1900
7	2570	2210	3380	3040	9800	12000	7180	1900	1230	1140	855	1640
8	2650	2060	3280	3100	10100	8880	8050	1910	1160	1200	869	1340
9	2090	3670	3020	3080	10900	7760	7450	2050	1380	1180	876	1300
10	1920	5690	2920	4660	11100	8420	7560	1930	1220	1180	883	1300
11	1850	6020	3220	4760	11700	9680	6990	1810	1430	1180	661	1290
12	1430	11300	3180	3750	12300	11400	6800	1800	1370	1100	466	1240
13	1460	5160	3400	3220	11700	12400	5920	1800	1220	808	932	1210
14	2400	4060	3220	3360	9240	12100	5020	1800	1070	1290	1260	1220
15	2180	4000	3160	3740	7580	11600	4760	1790	814	1260	1460	1290
16	1930	4150	2870	3950	7740	11300	5710	1820	1350	1460	1520	1500
17	1750	3910	2800	3790	9220	11700	4760	1800	1350	1350	1470	1710
18	1660	3650	3340	3580	9840	10700	3650	1900	1460	1340	1600	1750
19	1380	3290	3320	3070	7850	10100	3800	1870	1390	1170	1620	1590
20	1380	3120	3250	2840	7030	11600	3490	1840	1340	254	1460	1570
21	1660	3380	2940	2740	8010	11300	3650	1820	1000	724	1260	1520
22	1880	3560	2820	3240	9640	9990	3780	1770	855	939	1250	1380
23	1740	2980	2700	3580	10900	9170	3820	1670	1480	1050	834	1420
24	5430	4040	2940	3910	12100	8580	3920	1650	1380	1160	682	1540
25	3120	3570	3280	4280	11500	7870	3800	1640	1450	1220	1210	1430
26	2160	3320	3260	4490	10400	6960	3780	1550	1460	937	1570	1300
27	1840	3050	3420	4600	9930	6040	2780	1550	1440	585	1710	1450
28	2140	3310	3560	5100	9220	5180	2320	1590	1200	612	1720	1830
29	1920		3640	5960	8860	4760	2180	1620	1180	658	1720	3040
30	1820		2960	6030	7710	5540	2210	1550	1240	694	1730	4710
31	1790		2780		7250		1970	1580		724		4380
Mean	1970	3562	3456	3846	9107	9438	5164	1793	1298	1037	1146	1860
Ac. Ft. for Month	121100	197900	212500	228800	560000	561600	317500	110200	77250	63740	68180	114400

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey.

TABLE 22

DISCHARGE OF SAN JOAQUIN RIVER AT DELTA BRIDGE* - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	795	600	1160	835	785	1400	1420	14	0	0	0	0
2	820	550	1130	820	820	1400	1350	8				0
3	785	510	1120	785	870	1400	1230	6				9
4	690	459	1250	795	915	1390	1070	4				49
5	560	409	1370	820	930	1370	950	2				80
6	482	402	1430	825	945	1350	920	1				156
7	451	421	1420	875	965	1340	935	0				301
8	385	437	1390	1010	990	1340	975	1				339
9	395	535	1350	1070	1030	1350	995	1				328
10	530	605	1290	1090	1070	1370	1000	1				298
11	620	645	1230	1070	1120	1390	990	0				261
12	645	745	1150	1040	1160	1410	960	0				251
13	595	915	1060	1070	1210	1410	900		FLOW	FLOW	FLOW	245
14	530	1190	1000	1140	1260	1410	835					202
15	435	1340	975	1160	1300	1410	795					187
16	417	1390	955	1130	1330	1410	690					217
17	495	1410	940	1120	1350	1410	442					219
18	525	1390	915	1080	1350	1420	374		NO	NO	NO	220
19	510	1370	885	1060	1370	1440	386	FLOW				254
20	455	1350	855	1030	1370	1450	287					295
21	404	1320	860	995	1360	1460	146					317
22	346	1260	870	945	1350	1470	130					312
23	321	1180	865	860	1350	1480	122					301
24	353	1140	855	785	1340	1480	125	NO				288
25	388	1110	835	765	1330	1490	127					278
26	460	1100	810	735	1330	1490	129					275
27	640	1150	805	725	1330	1500	129					285
28	750	1190	815	740	1330	1500	126					287
29	765		815	755	1350	1480	117					278
30	720		800	765	1370	1460	68		0		0	317
31	665		840		1390		28	0		0		388
Mean	546	933	1034	930	1193	1423	605	1	0	0	0	233
Ac.Ft. for Month	33500	51020	63560	55330	73330	84660	37190	75	0	0	0	14360

* Also called Turner Island Bridge.

NOTE: Station maintained by U. S. Bureau of Reclamation; intermittent measurements of flow made by Water Supervisor. Station is located at county road bridge eight miles east and six miles north of Los Banos; Mile 158.7 above mouth of San Joaquin River. An undetermined amount of water by-passes this station through Pick Anderson Slough and other channels.

TABLE 23

DISCHARGE OF SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	3520	3180	4330	3440	3270	4330	4520	815	259	204	171	565
2	3540	3000	4330	3470	3330	4320	4500	695	253	169	147	650
3	3550	2820	4380	3470	3380	4330	4470	575	267	153	145	710
4	3530	2650	4520	3490	3450	4360	4380	493	273	167	141	780
5	3450	2480	4610	3530	3520	4390	4260	458	265	181	149	825
6	3210	2340	4780	3610	3590	4420	4090	408	261	189	147	860
7	2920	2260	4920	3740	3650	4420	3920	376	255	201	137	1110
8	2690	2340	4940	3870	3680	4400	3790	346	249	201	135	1660
9	2580	2530	4860	3940	3690	4390	3700	317	247	183	137	1900
10	2550	2780	4750	3960	3730	4350	3680	297	232	187	143	1960
11	2630	3080	4630	3980	3760	4320	3670	289	205	199	153	1920
12	2750	3390	4510	3980	3810	4300	3670	306	187	205	161	1820
13	2830	3680	4370	3980	3860	4310	3640	304	190	203	167	1830
14	2840	3970	4240	3960	3920	4340	3590	297	211	189	193	1830
15	2750	4240	4120	3940	3990	4380	3510	308	224	187	201	1820
16	2640	4410	4030	3930	4050	4410	3410	306	232	181	195	1900
17	2540	4510	3960	3940	4110	4440	3210	277	263	169	189	1920
18	2520	4570	3900	3970	4180	4440	2800	237	283	161	211	1850
19	2550	4600	3860	3940	4240	4440	2360	237	273	169	290	1830
20	2540	4610	3790	3880	4280	4420	2180	239	251	181	371	1890
21	2460	4580	3730	3830	4310	4420	1970	235	239	207	429	2000
22	2380	4530	3670	3770	4340	4440	1640	224	224	259	472	2060
23	2360	4450	3640	3710	4340	4470	1500	212	212	261	498	2060
24	2480	4380	3630	3630	4340	4450	1420	214	221	263	495	2030
25	2570	4320	3620	3520	4330	4470	1400	241	224	235	477	1980
26	2700	4290	3560	3390	4320	4490	1380	267	233	207	462	1940
27	2830	4350	3500	3280	4320	4490	1360	285	249	191	472	1940
28	2990	4350	3440	3210	4320	4490	1370	289	251	195	472	1990
29	3150		3400	3180	4300	4510	1350	299	247	199	477	2050
30	3250		3400	3190	4310	4510	1260	279	233	197	505	2170
31	3270		3410		4320		1030	275		191		2390
Mean	2857	3668	4091	3691	3969	4408	2872	335	240	196	278	1685
Ac.Ft. for Month	175700	203700	251600	219600	244000	262300	176600	20600	14310	12070	16550	103600

NOTE: This is a recording gage station at the county bridge on the road between Gustine and Stevinson, Mile 129.5 above mouth of San Joaquin River and 5.7 miles above the mouth of the Merced River. Recorder operated by United States Bureau of Reclamation. Measurements of flow made by Division of Water Resources and Bureau of Reclamation. Additional water during high flow periods passes this station via Mud Slough. See Table 24.

TABLE 24

DISCHARGE OF MUD CLOUGH (BRANCHES COMBINED) AT GUSTINE-STEVINSON HIGHWAY - 1941

Day	Daily Discharge in Second-foot											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	2150	1580	6420	2060	1650	4770	6220	3	3	3	4	0
2	2190	1320	6380	2140	1700	4720	6060	3	3	3	4	0
3	2220	1130	6750	2150	1740	4810	5810	3	3	3	4	0
4	2170	960	7850	2200	1790	4980	5160	3	3	3	4	0
5	1950	800	8550	2300	1850	5210	4270	3	3	3	4	0
6	1570	675	10010	2530	1910	5450	3410	3	3	3	4	0
7	1210	620	11440	3010	1960	5450	2640	3	3	3	4	0
8	995	675	11640	3580	1980	5310	2230	3	3	3	4	85
9	895	850	10860	3950	2000	5210	2030	3	3	3	4	209
10	865	1090	9630	4080	2080	4930	1980	3	3	3	4	245
11	940	1440	8700	4140	2160	4720	1970	3	3	3	4	220
12	1060	1980	7750	4170	2270	4600	1960	3	3	3	4	162
13	1140	2790	6700	4140	2440	4640	1920	3	3	3	4	165
14	1150	4110	5740	4080	2670	4850	1850	3	3	3	4	167
15	1060	5740	4990	3950	2970	5160	1730	3	3	3	4	162
16	955	6980	4440	3920	3230	5400	1610	3	3	3	4	209
17	855	7700	4080	3950	3520	5600	1390	3	3	3	4	217
18	845	8240	3730	4110	3820	5600	1030	3	3	3	4	180
19	865	8500	3520	3950	4190	5600	675	3	3	3	4	167
20	855	8600	3200	3640	4440	5500	540	3	3	3	4	203
21	785	8290	2960	3370	4640	5450	367	3	3	3	4	268
22	715	7900	2730	3140	4850	5600	145	3	3	3	4	306
23	695	7310	2640	2910	4850	5860	70	3	3	3	4	306
24	800	6790	2600	2600	4850	5700	38	3	3	3	4	287
25	890	6290	2560	2270	4810	5860	27	3	3	3	4	258
26	1010	6100	2400	1960	4720	5960	21	3	3	3	4	229
27	1140	6520	2230	1760	4680	6010	13	3	3	3	4	232
28	1310	6560	2080	1630	4680	5960	17	3	3	3	4	264
29	1550		1990	1580	4600	6170	11	3	3	3	4	300
30	1710		1990	1600	4640	6170	0	3	3	3	4	385
31	1740		2010		4720		0	3		3		565
Mean	1235	4341	5438	3029	3304	5375	1780	3	3	3	4	187
Ac.Ft. for Month	75940	241100	334400	180200	203100	319800	109500	184	178	184	246	11486

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and U. S. Bureau of Reclamation. To determine total flow passing the Gustine-Stevinson highway (Fremont Ford Bridge road) combine the flow in this table with that shown in Table 23.

TABLE 25

DISCHARGE OF SAN JOAQUIN RIVER NEAR NEWMAN - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	5600	5940	12500	7230	7480	13100	11200	1280	619	440	370	601
2	5720	5640	12900	7370	8050	12500	11200	1140	604	406	346	672
3	5730	5250	14700	7620	8310	12100	11100	1030	601	416	340	734
4	5710	4880	16800	7900	8210	12200	10800	940	562	410	338	800
5	5610	4580	18500	8450	8280	12900	10400	884	556	414	334	864
6	5230	4350	20100	9480	8760	13500	9610	832	538	428	330	924
7	4670	4200	21800	10000	9320	13900	8770	773	523	438	330	1070
8	4250	4270	22100	10600	9640	14000	7960	731	505	438	328	1580
9	3980	4490	21100	11100	9720	13800	7400	700	490	422	322	2040
10	3800	4930	19500	11400	9950	13200	7070	692	478	420	324	2250
11	3810	5800	17900	11500	10200	12300	6920	745	452	416	326	2310
12	3940	6650	16400	11400	10300	11900	6810	734	425	412	328	2210
13	4090	8270	14800	11100	10600	11900	6680	720	412	438	330	2150
14	4190	9160	12800	11000	10800	12300	6500	703	432	440	340	2210
15	4190	10800	11700	11000	11200	13000	6210	686	460	432	346	2220
16	4070	12600	10800	10900	11500	13500	5800	675	488	430	346	2310
17	3850	14300	10200	10800	11800	13700	5330	678	505	425	338	2420
18	3710	15400	9730	10800	12000	13600	4680	661	526	418	344	2350
19	3710	15800	9380	10400	12300	13400	3880	619	515	420	382	2270
20	3710	16000	9010	9720	12800	13000	3370	604	498	418	430	2300
21	3660	15700	8790	9250	13100	12400	3070	610	482	430	470	2420
22	3580	15000	8490	8900	13200	12900	2550	592	468	458	505	2540
23	3600	14100	8140	8540	13300	12800	2200	562	465	458	541	2590
24	3710	13300	7980	8070	13300	12400	2020	556	448	452	541	2540
25	4290	13000	7920	7550	13200	12300	1940	604	445	425	526	2490
26	4670	12300	7760	7250	13200	12200	1880	601	458	402	510	2400
27	4920	12300	7600	7050	13400	11800	1860	607	472	392	518	2370
28	5190	12700	7330	7020	13500	11600	1870	622	482	382	535	2460
29	5480		7030	6440	13400	11500	1850	607	492	382	535	2580
30	5780		7070	6520	13400	11400	1740	595	478	385	571	2750
31	6000		7180		13400		1500	610		380		3040
Mean	4531	9704	12520	9212	11210	12700	5618	722	497	420	404	2015
Ac.Ft. for Month	278600	538900	769600	548200	689500	755900	345500	44420	29550	25850	24050	123900

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Hills Ferry Bridge, Mile 123.7 above mouth of San Joaquin River and just below the mouth of the Merced River.

TABLE 26

DISCHARGE OF SAN JOAQUIN RIVER AT GRAYSON - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	5310	6460	13525	8490	7390	13800	11950	1900	995	745	855	835
2	5550	6400	13850	8490	7975	13500	11725	1720	960	740	730	965
3	5725	6160	14960	8450	8440	13050	11525	1630	880	735	660	965
4	5800	5780	17150	8675	8700	12750	11450	1475	880	750	650	1025
5	5850	5390	19250	9360	8775	12830	11300	1535	833	745	645	1095
6	5790	5090	20650	10180	8990	13250	11000	1365	830	830	590	1165
7	5550	4830	22325	10550	9375	13725	10120	1290	825	810	570	1240
8	5240	4750	23800	10800	9850	14100	9400	1145	845	840	560	1415
9	4800	5250	23500	11420	10200	14100	8710	1133	830	820	545	1820
10	4465	6215	22160	12100	10500	13820	8235	1135	740	790	540	2100
11	4300	6600	19950	12620	10750	13350	7880	1150	715	820	540	2260
12	4270	7295	17500	12800	11025	12875	7650	1147	690	870	545	2305
13	4360	7700	16200	12680	11225	12600	7490	1133	655	870	550	2265
14	4500	8340	15050	12440	11450	12650	7270	1125	645	830	555	2270
15	4560	9100	13750	12220	11600	12950	6950	1100	710	840	560	2300
16	4600	10425	12610	12100	11700	13350	6600	1060	755	830	565	2360
17	4460	12260	11700	11975	11800	13900	6175	1115	750	820	560	2500
18	4275	13750	11350	11875	11950	13850	5650	1105	743	725	560	2560
19	4175	14675	10600	11800	12085	13800	4980	1035	770	730	565	2520
20	4250	15200	10150	11530	12450	13700	4300	970	765	740	630	2490
21	4320	15450	9630	10975	12815	13350	3850	1000	778	830	690	2540
22	4300	15460	9375	10170	13100	13050	3400	1003	835	960	730	2615
23	4260	15175	9070	9400	13350	13150	2860	970	825	965	770	2690
24	4440	14760	8675	9015	13500	13325	2530	918	755	920	805	2720
25	4650	14250	8600	8600	13700	13250	2400	975	730	940	815	2710
26	4960	14000	8510	8215	13900	13175	2260	985	720	945	800	2660
27	5220	13525	8380	7920	13975	13135	2300	895	695	935	790	2630
28	5470	13370	8300	7750	14090	12800	2350	935	755	920	795	2710
29	5740		8300	7620	14100	12400	2280	935	820	900	810	3000
30	6025		8200	7300	14090	12200	2200	930	828	920	815	3150
31	6315		8270		14050		2100	983		930		3125
Mean	4953	9916	13721	10251	11513	13259	6416	1155	785	840	660	2159
Ac.Ft. for Month	304522	550731	843650	609957	707901	788995	394493	71002	46725	51600	39263	132744

NOTE: Recording gage station maintained jointly by Division of Water Resources, City of San Francisco, Modesto Irrigation District and Turlock Irrigation District. Station is at Laird Slough Bridge, Mile 96.05 above mouth of San Joaquin River.

TABLE 27

DISCHARGE OF SAN JOAQUIN RIVER AT HETCH HETCHY AQUEDUCT CROSSING - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	6650	6950	17120	11300	10920	20800	13940	2650	1905	1740	2110	1930
2	6775	6750	18600	11500	11200	20300	13400	2350	1850	1740	2020	1920
3	6810	6675	22650	11850	11530	20000	12750	2240	1750	1735	1870	2050
4	6990	6470	25900	12100	11970	20400	12450	2110	1710	1780	1770	2080
5	7100	6420	26600	13000	12500	21000	12860	1950	1670	1780	1740	2120
6	7075	6150	25550	15480	12900	21900	14300	1840	1615	1790	1690	2300
7	6950	5940	25400	16050	13310	23600	14550	1788	1595	1800	1670	2610
8	6900	6115	25350	15540	13800	24500	13800	1735	1630	1810	1660	2730
9	6550	6235	25300	15300	14300	22950	12900	1670	1580	1800	1630	3010
10	6100	6925	25150	15290	14600	20900	11960	1675	1345	1770	1620	3360
11	5840	8065	23800	15800	15000	19500	11040	1750	1310	1745	1630	3600
12	5730	8350	22250	16450	15550	19350	10190	1753	1215	1780	1700	3700
13	5700	9280	20600	16500	16100	19900	9800	1800	1205	1805	1910	3660
14	5800	9500	19500	16320	17000	20150	9420	1765	1305	1860	2020	3650
15	5975	10100	18500	16000	17050	21400	8890	1760	1415	1920	2080	3680
16	6100	11600	17250	15900	16300	22200	8450	1725	1415	2100	2080	3900
17	6020	13600	16080	15540	15540	22160	7900	1800	1375	2060	2050	4540
18	5775	15700	15300	15200	15360	21600	7320	1837	1400	1820	2060	4820
19	5550	17540	14850	14900	15680	21400	6650	1785	1575	1820	2100	4840
20	5525	18500	14380	14400	15650	20800	5500	1705	1565	1840	2100	4820
21	5540	18680	13900	13680	15550	20400	5110	1825	1605	2000	2060	4820
22	5650	18600	13400	13050	15500	20450	4600	1920	1700	2180	1980	4760
23	5810	18550	12700	12620	15900	20500	4130	1935	1645	2180	1960	4860
24	6000	17900	12050	12200	16650	19900	3690	1935	1540	2090	1950	5060
25	6150	18090	12000	11700	17700	19000	3350	1965	1605	2090	1940	5080
26	6350	18780	11800	11290	20000	18000	3120	1920	1665	2140	1945	5000
27	6470	18040	11300	10900	22200	17000	3090	1885	1640	2170	1930	4800
28	6625	17500	11050	10750	23000	16150	3110	1895	1690	2150	1920	5040
29	6875		11150	10760	22700	15400	3085	1900	1790	2110	1910	5300
30	7050		11050	10800	22200	14650	2940	1880	1790	2110	1920	5680
31	7210		11100		21450		2860	1880		2130		6100
Mean	6311	11093	17795	13732	16100	20209	8295	1891	1570	1930	1901	3930
Ac.Ft. for Month	388000	660500	1094000	819200	990000	1202000	510100	116300	93400	118700	113100	241600

NOTE: Recording gage station maintained by City of San Francisco Public Utilities Commission (Hetch Hetchy Water Supply) and Division of Water Resources. Station is at Mile 82.65 above mouth of San Joaquin River.

TABLE 28

DISCHARGE OF SAN JOAQUIN RIVER NEAR VERNALIS - 1941

Day	Daily Discharge in Second-Feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	7620	8000	19400	13700	14100	24000	15600	3100	2080	1850	2530	2290
2	7700	7920	21000	14100	14500	23100	15000	2900	2020	1800	2430	2330
3	7620	7620	26400	14700	14900	22600	14300	2600	1940	1810	2270	2380
4	7830	7210	31900	15200	15600	22900	13900	2400	1820	1880	2140	2430
5	8100	7000	34100	15900	16400	23500	14200	2270	1790	1900	2140	2660
6	8120	6900	32500	19200	17200	23900	15000	2120	1690	1980	2100	2980
7	7770	6800	30300	20900	17800	25300	16200	2040	1650	1980	2080	3450
8	7770	6710	29100	19800	18600	26500	16000	1980	1710	1980	2060	3650
9	7420	6820	28700	19100	19200	26000	15000	1870	1680	1990	2030	3940
10	6860	7550	27700	18900	19700	23900	14000	1940	1470	1940	2020	4310
11	6540	8920	26700	19400	20400	22200	13000	1990	1400	1940	2030	4610
12	6380	9320	25600	20200	21300	21800	12000	1980	1350	1980	2090	4750
13	6250	10300	24200	20600	22400	22100	11000	1990	1300	2030	2330	4740
14	6280	10400	23000	20000	24000	21900	10000	2010	1420	2110	2510	4730
15	6620	10800	21900	19500	24300	23800	9500	1940	1520	2180	2560	4750
16	6910	12200	20500	19400	23000	25100	9000	1860	1580	2430	2570	4600
17	6830	14300	19200	19200	21500	25300	8200	1930	1520	2400	2560	5360
18	6610	16600	18300	18900	20800	24300	7640	1980	1530	2160	2530	5900
19	6390	18800	17700	18500	20200	23500	7000	1900	1660	2140	2600	5900
20	6340	20100	17300	18000	19900	22100	6000	1840	1660	2210	2580	5900
21	6260	20900	16800	17100	20300	21000	5500	1840	1720	2290	2540	5800
22	6420	20800	16200	16400	20700	21200	4500	2010	1810	2480	2400	5300
23	6730	20800	15500	15600	21300	21700	4100	2020	1790	2510	2380	5400
24	6960	20600	14700	14900	22700	21300	3700	2060	1670	2420	2400	6000
25	7130	20200	14600	14600	24100	20500	3500	2070	1720	2440	2400	6100
26	7250	19400	14500	14100	25900	19800	3400	2060	1790	2480	2410	5900
27	7290	20000	13800	13700	28100	18700	3300	2040	1750	2580	2380	5500
28	7370	20000	13600	13500	29300	17700	3300	2060	1810	2600	2330	5900
29	7790		13700	13600	28700	17100	3200	2050	1870	2560	2240	6000
30	7980		13600	13900	27400	16300	3200	2000	1870	2540	2240	6800
31	8010		13700		25500		3170	2090		2570		7700
Mean	7134	13110	21170	17090	21280	22300	9142	2095	1686	2199	2329	4776
Ac.Ft. for Month	438600	727900	1302000	1017000	1309000	1327000	562100	128800	100300	135200	138600	293700

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Durham Ferry Bridge below the mouth of the Stanislaus River and is at Mile 76.7 above mouth of the San Joaquin River.

TABLE 29

DISCHARGE OF MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	40	1400	2980	1840	3700	3190	1200	36	27	25	18	8
2	34	1400	5080	2040	3700	3030	1300	84	29	23	18	8
3	18	1400	5100	2800	2950	3700	1550	61	29	23	18	9
4	31	1400	5200	2720	3280	4600	1740	42	31	21	18	9
5	44	1400	4900	3900	4000	5200	1740	42	31	21	21	9
6	42	1400	4340	3920	4500	5300	1680	42	29	21	13	11
7	81	1400	4080	3780	4500	5300	1520	42	27	21	7	9
8	61	1400	3860	3700	4600	4800	1390	42	29	21	7	11
9	69	1460	3580	3720	4700	3900	1300	40	27	21	7	16
10	74	1520	3560	3430	4700	3360	1140	40	25	21	7	17
11	71	1690	3560	3060	4700	3360	980	40	25	23	7	18
12	69	1790	2750	3030	4600	3620	850	36	25	23	7	17
13	69	1500	2100	3030	4600	4100	630	38	25	25	7	17
14	178	1400	2050	2870	4600	4700	430	46	34	25	7	21
15	79	1510	2030	2870	4500	4700	255	46	34	29	7	27
16	69	1430	1970	2870	4500	4500	79	44	29	32	9	25
17	57	1580	1850	2870	4500	4400	21	44	27	29	12	21
18	53	1430	1840	2720	4500	4000	25	40	29	23	8	18
19	51	1430	1860	2440	4500	3360	23	38	25	20	9	16
20	48	1430	2000	2300	4500	2950	21	40	23	16	11	13
21	71	1370	1910	2300	4500	3900	21	38	23	14	8	13
22	120	1370	1690	1980	4500	2950	21	40	21	16	8	13
23	805	1370	1680	1620	4500	2650	21	42	25	16	12	13
24	1090	1540	1670	1570	4500	2580	21	44	27	18	17	14
25	1290	1370	1680	1800	4700	2440	27	46	25	17	17	16
26	1400	1370	1640	2160	5000	1570	38	42	25	17	13	16
27	1400	1370	1310	2440	5000	1400	69	31	25	17	11	18
28	1400	1470	1240	1420	5000	1250	61	27	25	17	7	74
29	1400		1690	2120	5000	1150	53	25	25	17	7	79
30	1400		1660	3620	4900	1150	53	23	25	17	12	150
31	1340		1570		3800		42	25		18		310
Mean	418	1450	2660	2700	4440	3440	590	41	27	21	11	33
Ac.Ft. for Month	25700	80500	164000	161000	273000	205000	36300	2510	1600	1280	655	2020

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Merced Irrigation District.
Station is at Mile 43.1 above mouth.

TABLE 30

DISCHARGE OF MERCED RIVER AT CRESSEY BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								111	132	139	88	97
2								109	129	140	89	98
3								108	121	139	89	101
4								106	129	136	87	91
5								105	118	140	86	88
6								119	121	145	80	87
7								121	124	147	80	86
8								126	109	133	78	84
9								117	108	136	77	83
10								145	108	136	77	88
11								145	104	134	77	92
12								143	101	140	77	92
13								137	105	150	77	92
14								133	112	150	77	95
15								133	119	156	77	103
16					*4430		295	133	117	160	77	103
17							195	143	108	160	78	101
18							168	137	100	139	79	97
19							160	136	103	115	78	92
20							153	135	108	101	78	78
21				*1980			145	133	118	101	78	88
22							136	123	114	105	79	87
23							129	123	112	103	80	86
24							119	129	109	100	82	86
25							118	133	105	100	87	86
26							118	132	118	98	88	87
27							117	131	131	97	89	89
28							117	115	142	95	88	109
29							115	112	145	94	92	142
30							114	114	134	91	97	170
31							112	124		88		340
Mean								126	117	125	82	104
Ac.Ft for Month								7757	6950	7670	4890	6380

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Turlock Irrigation District. Station is at Mile 27.6 above mouth. Station established April 15, 1941 but gage height data insufficient to report daily discharge prior to July 16.

* Measured discharge.

TABLE 31

DISCHARGE OF MERCED RIVER NEAR LIVINGSTON - 1941

Day	Daily Discharge in Second-feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct	Nov.	Dec.
1	302	1280	1700	1770	3750	3840	1340	259	248	190	150	159
2	259	1270	4610	1980	3880	3210	1540	237	234	210	150	159
3	234	1270	6010	2310	3560	3260	1670	270	214	225	145	163
4	220	1270	6200	2410	3090	4080	1800	278	192	220	145	167
5	217	1260	5700	4130	3510	4840	1900	232	174	200	145	161
6	230	1290	5300	4460	4310	5340	1840	216	165	195	145	159
7	295	1410	4700	4190	4620	5420	1760	218	176	199	145	159
8	368	1360	4320	4020	4590	5430	1650	228	190	210	142	157
9	281	1400	3980	3970	4760	4860	1550	220	148	193	140	149
10	247	1600	3770	4050	4940	3870	1450	254	161	190	136	155
11	228	1900	3720	3860	4950	3490	1350	294	161	185	134	173
12	213	1950	3620	3470	4910	3510	1200	259	152	205	132	169
13	207	2500	2620	3240	4900	3890	1100	259	157	250	131	165
14	211	1660	2280	3120	4950	4620	900	250	163	240	131	169
15	302	1550	2230	2950	5000	5090	700	241	200	235	132	179
16	273	1600	2200	2930	5000	5050	550	245	210	230	132	181
17	245	1700	2090	2930	4950	4760	400	276	214	229	134	175
18	228	1900	2010	2930	4940	4630	300	259	196	214	136	173
19	213	1700	1990	2440	4970	4220	287	222	200	199	138	169
20	205	1650	2010	2120	4930	3190	265	222	180	190	138	167
21	202	1600	2080	2090	4840	3020	254	212	204	180	142	165
22	319	1600	1930	1930	4850	3900	241	190	216	170	151	163
23	345	1600	1820	1740	4830	3010	232	200	204	160	153	161
24	807	1600	1800	1580	4810	2800	230	234	182	155	149	159
25	1290	2300	1790	1790	4820	2760	245	237	180	155	149	157
26	1260	1800	1780	1940	5140	2300	248	194	178	155	155	159
27	1280	1650	1680	2330	5360	1820	265	232	192	155	155	165
28	1280	1600	1480	2180	5350	1700	303	198	208	150	155	177
29	1260		1630	1700	5380	1510	294	194	218	150	163	216
30	1290		1820	2890	5340	1310	276	196	188	150	163	231
31	1290		1770		4860		256	224		150		357
Mean	508	1617	2924	2782	4713	3718	851	234	190	192	144	175
Ac. Ft. for Month	31260	89790	179800	165500	289800	221200	52360	14380	11320	11780	8560	10750

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. The station is at Mile 17.1 above mouth.

TABLE 32

DISCHARGE OF MERCED RIVER NEAR MOUTH - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	*369	1250	1620	1770	3820	4160	1230	277	329	250	221	*209
2	323	1320	3010	1910	3990	3360	1320	274	325	247	216	211
3	291	1270	5060	2220	3930	3150	1440	277	317	259	207	211
4	270	1290	5390	2440	3310	3710	1590	283	283	256	204	210
5	258	1280	5430	3480	3510	4420	1720	274	284	256	202	213
6	250	1290	5150	4690	4070	4970	1670	266	273	267	201	210
7	474	1390	4610	4330	4570	5130	1670	268	279	269	199	209
8	345	1460	4210	4160	4610	5160	1550	269	274	266	198	205
9	308	1390	4020	4050	4680	5000	1490	265	254	260	197	204
10	284	1640	3760	4100	4890	4100	1400	283	250	262	194	202
11	263	1920	3660	4020	4900	2730	1290	330	248	251	193	208
12	249	1930	3630	3770	4960	3330	1150	323	242	257	191	197
13	242	2620	3930	3370	4950	3550	1080	318	238	272	190	191
14	243	1700	2260	3250	4950	4160	965	322	243	280	188	191
15	342	1560	2140	3050	4930	4710	790	*309	262	279	187	193
16	322	1670	2100	2970	4890	4860	675	311	277	274	187	198
17	283	1680	2020	2940	4860	4630	540	328	285	275	187	195
18	288	1950	1910	2970	4840	4490	454	349	275	263	186	193
19	273	1730	1910	2690	4870	4240	372	333	273	271	185	189
20	266	1640	1870	2130	4840	3550	347	317	268	265	185	185
21	264	1610	1970	2040	4770	3160	332	325	271	268	185	185
22	288	1610	1930	1920	4710	3960	313	317	287	261	185	184
23	415	1620	1730	1730	4720	3070	302	307	277	254	186	184
24	496	1620	1700	1590	4690	2660	289	304	257	243	187	180
25	1140	2350	1680	1630	4680	2570	297	327	251	238	186	180
26	1220	1760	1690	1890	4820	2300	299	307	259	231	187	178
27	1250	1630	1730	2220	5130	1720	311	301	263	221	191	182
28	1250	1590	1550	2430	5160	1580	329	302	273	232	199	184
29	1240		1520	1730	5190	1460	319	292	280	229	201	197
30	1300		1850	2370	5180	965	295	287	275	220	203	215
31	1260		1840		5040		282	311		220		*249
Mean	518	1635	2805	2795	4660	3560	842	302	272	255	194	198
Ac.Ft. for Month	31870	90780	173300	166300	286500	211900	51800	18560	16200	15700	11600	12180

NOTE: Station maintained by Division of Water Resources (Water Supervision) and is at Mile 1.1 above mouth.
*Record for following periods from U. S. Bureau of Reclamation station 4 miles above mouth, January 1 to Aug. 15 and December 1 to 31. State station affected by back water from San Joaquin river except during low flow periods.

TABLE 33

DISCHARGE OF DRY CREEK NEAR MODESTO (CLAUSS ROAD BRIDGE) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1				57	93	211	180	59	70	57	139	34
2				60	109	217	101	60	66	53	55	34
3				62	128	213	62	67	64	53	46	34
4				82	144	200	64	71	56	60	41	34
5				**	124	158	71	59	56	50	39	34
6				**	91	114	64	55	56	44	38	34
7				324	73	106	65	54	64	46	38	34
8				213	66	89	64	52	70	46	38	34
9				162	68	94	58	53	66	46	38	34
10				145	73	105	59	61	60	48	38	34
11				428	76	77	59	67	55	48	37	34
12				446	76	61	60	62	53	50	36	34
13				237	78	89	58	62	54	74	37	34
14				162	73	155	61	65	57	90	36	34
15				122	68	171	56	61	62	83	36	35
16				99	62	119	61	63	58	77	36	40
17				86	73	76	73	68	57	62	36	44
18				81	105	65	59	71	57	62	35	42
19				80	104	59	56	63	56	55	35	40
20				75	79	72	53	57	57	55	34	38
21				71	86	65	53	67	55	62	34	39
22	84			73	86	74	53	67	54	88	34	38
23				73	84	95	53	61	58	96	34	36
24				67	96	87	53	67	56	111	34	35
25				66	87	115	56	81	58	112	34	34
26		355	*57	74	119	144	60	86	56	110	34	34
27			56	68	125	162	57	85	58	102	34	34
28			56	70	139	168	55	79	54	101	34	39
29			55	67	144	178	53	72	54	108	34	52
30			55	79	161	183	52	67	63	84	34	366
31			55		174		54	73		80		550
Mean				---	99	124	64	66	59	71	40	64
Ac.Ft. for month				---	6080	7380	3930	4040	3490	4390	2400	3910
M.I.D.Spill Below Station Ac.Ft.	0	0	320	660	1060	840	600	720	560	1130	10	0
Discharge to Tuolumne River Ac.Ft.					7140	8220	4530	4760	5050	5520	2410	3910

* Beginning of record for season. **Stage greatly exceeded rating. No estimate of flow made.

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Modesto Irrigation District.
Station moved to this location, 5.4 miles above Modesto in 1941 from previous location at Mile 2.9.

TABLE 34

DISCHARGE OF TUOLUMNE RIVER AT LA GRANGE BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	900	126	7360	2520	2040	4700	534	137	381	538	622	660
2	974	58	10530	3470	2070	5360	24	137	381	538	546	635
3	1020	62	9100	3040	2840	6810	20	137	381	542	574	600
4	909	48	6500	3910	3550	7860	2040	137	381	542	546	600
5	899	65	5320	6730	4220	9080	4150	137	381	546	534	976
6	1030	508	4400	4450	4410	9380	3720	137	378	546	530	1150
7	997	516	3860	3750	4590	7990	3330	137	381	542	530	1050
8	955	529	3290	3270	4400	5750	3160	135	57	542	534	1170
9	969	505	3130	3000	4700	4250	3040	139	190	546	538	1170
10	986	564	3430	3600	4700	4820	2220	135	19	546	586	1170
11	953	633	3300	4180	4970	6300	1740	205	366	542	805	1160
12	843	605	3190	3890	5660	8170	1180	198	345	546	1060	1160
13	1000	545	3250	3450	5660	8870	850	198	190	542	1110	1130
14	964	1500	3420	3660	4620	8720	850	198	190	795	1130	1080
15	981	3100	2990	3470	3640	7920	682	185	190	865	1030	1760
16	953	4100	2950	3020	3200	6820	546	198	190	582	1020	1900
17	986	3970	3240	2890	3390	6380	542	198	366	530	1120	1880
18	975	4000	3220	2650	3530	6840	550	198	366	530	1120	1880
19	893	3470	3230	1970	2940	6020	550	351	381	530	1050	1900
20	964	2970	3110	1800	2380	6920	550	538	381	530	835	1900
21	1000	2840	2890	2020	2680	7140	550	538	381	530	750	1850
22	964	2840	2500	1970	3760	6120	550	538	381	534	686	1910
23	975	2580	2570	2170	4470	5410	546	538	381	534	618	1880
24	909	3680	3070	2390	5500	4760	309	538	555	534	725	1880
25	937	3910	2660	2290	8560	3070	309	538	555	538	664	1840
26	854	3340	2240	2110	9660	2840	309	538	555	526	664	1880
27	920	2980	2250	2170	8540	2320	309	538	555	534	668	1910
28	893	2850	2220	2580	7450	1850	309	538	555	466	650	1850
29	872		2210	2800	6860	931	309	538	555	534	664	1900
30	806		2260	2970	6040	909	318	381	555	538	590	1910
31	126		2440		5100		137	381		618		1880
Mean	919	1809	3746	3073	4766	5837	1104	304	364	558	752	1472
Ac.Ft. for Month	56500	104900	230300	182800	293000	347300	67900	18700	21700	34300	44700	90500

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Turlock Irrigation District.

TABLE 35

DISCHARGE OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	1150	187	7130	2750	3130	5160	850	193	438	600	672	672
2	1120	224	12100	3680	2040	5730	159	193	438	594	678	666
3	1220	214	10900	3620	3040	7450	106	193	438	588	594	648
4	1140	181	7700	3660	3770	8800	552	193	438	588	624	636
5	1080	160	6150	8000	4450	10100	4700	193	438	594	588	848
6	1190	370	5030	5290	4780	10800	4250	193	440	594	588	1090
7	1240	660	4400	4190	5030	9600	3650	189	438	594	582	1090
8	1160	660	3760	3680	4820	6920	3510	189	259	600	582	1150
9	1140	690	3480	3370	5000	5020	3330	189	141	600	588	1190
10	1160	760	3590	3840	5160	4930	2640	189	128	594	576	1200
11	1120	750	3680	4490	5480	6630	1890	186	70	588	708	1190
12	1050	870	3540	4340	6200	9000	1810	235	239	594	1020	1170
13	1150	714	3550	3820	6400	10200	1400	246	298	594	1100	1140
14	1160	1180	3820	3820	5430	10000	864	246	276	648	1170	1040
15	1140	3160	3340	3880	5880	9300	784	225	228	928	1100	1630
16	1110	4440	3240	3240	3650	8200	594	245	228	760	1060	2020
17	1150	4430	3490	3170	3730	6910	588	249	365	588	1100	2020
18	1130	4540	3450	2970	3730	7790	583	249	434	582	1160	2000
19	1080	4070	3510	2220	3330	6840	600	265	434	582	1100	2020
20	1090	3410	3400	1960	2580	7540	600	588	434	588	920	1990
21	1160	3180	3230	2070	2780	8300	600	588	434	600	800	2020
22	1140	3190	2780	2090	3910	7060	600	588	434	594	736	2060
23	1160	3050	2760	2270	4810	6100	600	588	434	588	684	2060
24	1070	3950	3190	2580	5980	5380	419	588	582	588	684	2020
25	1060	4540	3000	2400	9200	4550	384	588	588	582	714	1960
26	1020	3830	2420	2250	11000	3800	381	588	594	582	708	1970
27	1070	3410	2420	2280	10100	2970	381	588	594	594	684	2010
28	1060	3190	2420	2660	8700	2190	381	588	594	530	690	1930
29	1050		2430	2890	7890	1140	377	594	594	576	736	1960
30	990		2580	3200	7020	940	397	451	600	582	684	1950
31	221		2580		5830		263	451		594		1950
Mean	1090	2143	4164	3356	5350	6645	1234	350	402	607	754	1526
Ac.Ft. for Month	67000	119000	256000	199700	329000	395400	75860	21520	23900	37300	44890	93820

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Modesto Irrigation District.
Station is at Mile 39.9 above mouth.

TABLE 36

DISCHARGE OF TUOLUMNE RIVER AT HICKMAN-WATERFORD BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	1270	237	5640	2740	3120	4990	1070	219	477	674	827	715
2	1150	248	11800	3410	3020	5250	234	213	470	669	820	729
3	1270	248	11100	3410	2930	6740	150	213	471	669	687	722
4	1190	234	7620	3310	3900	8260	456	210	471	674	729	680
5	1150	210	5900	7620	4300	9700	4000	213	471	674	680	834
6	1190	328	4860	5250	4400	10800	4100	210	479	680	674	1310
7	1270	624	4200	4000	4730	9700	3600	210	469	680	669	1270
8	1190	646	3700	4000	4600	7020	3410	210	426	680	669	1270
9	1190	680	3500	3410	4730	4860	3220	210	166	687	669	1350
10	1190	771	3500	3800	4730	4600	2830	213	249	680	663	1390
11	1190	757	3600	4300	4990	5900	2020	210	131	680	813	1350
12	1110	967	3410	4300	5640	9260	2070	228	277	687	1190	1350
13	1110	757	3410	4000	5900	9860	1780	252	320	687	1350	1270
14	1230	967	3600	3800	5120	9860	1070	244	401	1020	1390	1270
15	1190	2830	3410	4000	4100	9220	1000	240	269	1150	1350	1660
16	1190	4100	3220	3310	3410	8100	680	202	269	1030	1350	2190
17	1190	4200	3310	3220	3500	6460	663	297	307	694	1310	2190
18	1190	4300	3410	3020	3700	7460	652	297	458	674	1390	2190
19	1150	3900	3410	2440	3410	6740	669	301	463	669	1350	2190
20	1110	3410	3410	2190	2740	6800	669	624	465	663	1190	2070
21	1190	3120	3220	2150	2740	7940	663	658	471	694	946	2150
22	1230	3120	2830	2230	3600	6880	663	669	471	680	890	2150
23	1190	2930	2830	2350	4500	5640	658	669	471	669	834	2190
24	1150	3500	3120	2640	5120	5120	428	674	652	663	785	2150
25	1110	4300	3120	2480	8260	4200	360	674	669	663	834	2110
26	1110	3700	2520	2390	10700	3310	352	680	669	663	813	2110
27	1110	3310	2520	2560	10000	2640	384	680	674	674	827	2110
28	1070	3120	2520	2830	8420	2350	380	674	674	607	813	2150
29	1110		2440	2930	7460	1420	368	669	669	641	792	2190
30	1110		2600	3220	6600	1070	380	505	674	658	778	2190
31	396		2520		5640		344	485		680		2150
Mean	1150	2050	4070	3380	5030	6370	1270	391	453	710	936	1670
Ac.Ft. for Month	70400	114000	250000	201000	309000	379000	78000	24100	27000	43700	55700	102000

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Modesto Irrigation District.
Station is at Mile 31.7 above mouth.

TABLE 37

DISCHARGE OF TUOLUMNE RIVER AT MODESTO - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	NOv.	Dec.
1	1520	432	4050	2860	3360	5420	1850	647	813	885	1060	834
2	1290	390	9810	2980	3170	5240	1290	570	772	872	984	852
3	1240	387	11700	3730	3220	4740	975	597	759	872	854	847
4	1240	372	10300	3300	3540	7480	912	588	777	876	835	812
5	1290	345	7670	6780	4050	8490	3060	539	741	854	822	789
6	1200	350	5900	8030	4490	9640	4390	502	719	849	799	1180
7	1360	831	4700	4910	4640	10000	3860	534	719	862	786	1380
8	1580	997	4020	4050	4810	8490	3660	525	714	872	772	1320
9	1360	858	3630	3630	4600	5940	3450	529	480	885	768	1430
10	1290	1220	3420	3660	4880	4810	3330	539	444	876	782	1500
11	1290	1740	3630	4360	4990	5380	2500	570	385	872	809	1480
12	1220	1700	3480	5060	5380	6980	2300	574	355	867	1060	1460
13	1150	1760	3390	4420	5980	8680	2260	647	516	899	1370	1470
14	1290	1110	3600	3890	5830	9390	1690	570	579	907	1410	1480
15	1400	2140	3890	4080	4740	9350	1470	565	529	1160	1460	1420
16	1380	3510	3280	3730	3730	8550	1290	539	460	1240	1400	2120
17	1330	4180	3180	3280	3510	7100	1180	561	460	962	1330	2320
18	1290	4460	3360	3150	3700	7020	1130	570	615	880	1490	2340
19	1240	4260	3360	2840	3730	7100	1110	552	669	876	1450	2340
20	1160	3630	3330	2440	3050	6760	1110	637	655	872	1390	2320
21	1220	3130	3220	2280	2770	7440	1110	925	682	925	1160	2320
22	1310	3080	3050	2420	3230	7440	1070	948	696	979	1010	2280
23	1470	3050	2790	2440	4180	6390	1070	921	651	934	937	2380
24	1380	3000	2820	2680	4810	5680	1020	930	674	917	870	2360
25	1490	5380	3180	2660	6460	5020	854	939	894	944	924	2360
26	1340	4350	2800	2640	9180	4050	817	925	921	962	906	2290
27	1200	3630	2640	2600	10100	3300	831	930	894	966	892	2290
28	1270	3270	2710	2690	9180	2890	804	925	899	952	910	2400
29	1200		2690	2910	8070	2530	759	921	894	862	888	2310
30	1180		2780	3250	7320	1920	754	930	889	921	906	2470
31	899		2660		6350		777	804		917		2720
Mean	1293	2270	4227	3592	5066	6441	1699	692	675	920	1034	1802
Ac.Ft. for Month	79500	126100	259900	213700	311500	383200	104500	42600	40200	56600	61500	110800

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Modesto Irrigation District. Located at old U.S. 99 highway bridge and is at mile 15.75 above mouth.

TABLE 38
DISCHARGE OF TUOLUMNE RIVER AT TUOLUMNE CITY - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	1700	775	3300	3170	3700	5790	1725	680	865	900	1120	950
2	1500	680	8100	3225	3610	5530	1275	630	845	960	1100	945
3	1450	650	11550	3900	3675	5950	850	630	840	925	1005	950
4	1515	525	10750	3825	3800	6970	730	635	845	975	960	915
5	1500	375	7850	5125	4315	8050	2290	610	815	900	960	890
6	1400	300	6200	8250	4710	9475	4400	590	785	885	930	1170
7	1500	475	5000	4315	4950	10375	4180	600	795	905	920	1410
8	1720	950	4525	4350	5025	9025	3950	590	785	930	910	1375
9	1550	875	4200	4250	4950	6430	3760	580	670	925	905	1440
10	1400	1225	3950	4200	3975	5400	3580	585	535	935	920	1445
11	1350	1075	3940	4625	4075	5500	3080	605	530	930	925	1490
12	1300	1750	3850	5200	5475	6750	2450	600	460	935	1110	1505
13	1175	2075	3760	4875	4225	8250	2375	640	605	955	1400	1500
14	1315	1820	3750	4225	4275	9200	1825	615	635	980	1490	1490
15	1425	2125	3770	4350	5250	9100	1600	615	645	1150	1535	1465
16	1515	3425	3550	4200	4850	8100	1510	615	595	1350	1510	1920
17	1400	4425	3400	3550	4625	7000	1410	630	580	1165	1480	2170
18	1360	4600	3410	3600	4225	6775	1315	630	695	1035	1530	2100
19	1460	4720	3375	3400	3875	7050	1215	675	760	1015	1530	2190
20	1325	3880	3350	2830	3600	6425	1105	675	760	1080	1495	2190
21	1350	3500	3300	2450	3425	7220	1040	990	785	1075	1310	2200
22	1400	3450	3260	2550	3675	7500	985	1040	800	1040	1175	2175
23	1550	3400	3180	2500	4400	6500	945	1035	775	1025	1090	2245
24	1540	3115	3150	2650	5515	6000	915	1040	775	1030	1020	2230
25	1560	4650	3520	2730	6875	6075	820	1045	895	1040	1030	2230
26	1475	4470	3230	2750	8150	4570	785	1020	940	1050	1025	2195
27	1315	3660	3000	2700	10050	3715	775	1030	940	1100	1010	2215
28	1320	3250	3025	2880	9550	3150	765	1015	960	1110	1010	2275
29	1400		3050	3200	8050	2625	745	1000	940	1075	1010	2245
30	1410		3040	3425	7300	1950	730	1000	910	1055	1010	2250
31	1315		3025		6480		740	880		1040		2395
Mean	1435	2394	4399	3777	5182	6548	1764	759	759	1015	1148	1750
Ac.Ft.for Month	88260	132900	270470	224700	318700	389700	108400	46660	45150	62430	68280	107600
Diversions Below Station Ac.Ft.	0	0	0	0	140	100	60	80	80	40	0	0
M.I.D. Spill Below Station, Ac.Ft.	0	0	400	1200	1300	800	700	700	600	1100	0	0
*Discharge to San Joaquin R. Ac.Ft.	88260	132900	270900	225900	319900	390400	109000	47280	45670	63490	68280	107600

NOTE: Recording gage station maintained jointly by Division of Water Resources, City of San Francisco, Modesto Irrigation District and Turlock Irrigation District. Station is 3.35 above the mouth.

*Neglecting seepage return below station.

TABLE 39

DISCHARGE OF STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	632	723	5920	2260	3030	2660	314	25	24	20	44	207
2	481	563	8160	2810	3250	3800	447	25	24	19	55	207
3	930	542	8020	2460	3800	3880	529	25	24	19	65	361
4	954	589	5100	3800	4600	3560	759	25	22	18	62	750
5	666	524	3800	5920	5440	2810	835	25	22	18	180	795
6	464	750	3100	3480	5800	3720	782	24	22	19	153	795
7	813	632	2660	2840	6280	3880	772	24	22	18	131	795
8	628	383	2460	2660	6040	3400	671	28	24	18	127	662
9	593	1150	1910	2810	7240	2810	542	25	22	18	123	705
10	559	1540	2730	3180	7240	2520	400	25	20	18	123	772
11	456	1100	2460	3330	8160	2660	248	25	19	18	104	772
12	236	1250	2130	2880	9980	2060	89	25	19	16	123	772
13	264	732	2390	2100	9700	917	210	25	19	14	123	772
14	824	623	2730	2810	7120	6270	75	25	13	9	123	490
15	641	662	2390	2810	5720	4460	39	25	19	9	123	524
16	619	795	1940	3060	5440	3720	33	25	19	12	130	885
17	559	1120	2440	2890	6970	3250	25	28	19	14	130	840
18	546	772	2530	2560	7000	2160	28	25	19	16	142	840
19	456	978	2610	2160	5680	309	25	25	19	18	131	840
20	327	1150	2520	1590	4900	305	25	25	19	18	127	469
21	719	1480	2230	2350	5000	1170	25	25	19	16	123	68
22	1200	1350	1940	1540	6760	2730	25	25	19	14	226	226
23	854	1590	1510	1590	7480	1480	25	25	19	13	210	840
24	1050	3250	2290	1700	7600	1730	25	28	19	12	210	840
25	589	2590	1700	1790	7360	1070	25	28	19	12	153	512
26	723	2190	1540	2060	7500	314	25	25	19	12	199	490
27	813	1940	1650	2060	5920	305	25	28	22	12	142	572
28	1050	1850	1760	3030	5100	318	25	30	22	12	130	447
29	750		1850	3100	3720	309	25	33	20	9	191	1120
30	602		1880	3330	2590	292	25	25	20	22	195	2000
31	978		1790		3250		25	25		36		1970
Mean	677	1170	2840	2700	5990	2300	230	26	20	16	137	721
Ac.Ft. for Month	41600	65100	175000	161000	368000	137000	14100	1590	1210	990	8180	44300

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision) and Oakdale Irrigation District.
Station is at Mile 44.7 above mouth or 5.7 miles above Oakdale.

TABLE 40

DISCHARGE OF STANISLAUS RIVER AT RIVERBANK (BURNEYVILLE BRIDGE) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	*800	1190	3760	2270	3170	3170	514	101	102	87	105	262
2	*600	882	7150	2590	3110	3360	592	108	102	87	112	262
3	*1000	529	8300	2640	3420	3970	738	106	99	87	120	302
4	*1000	828	7250	2590	4530	4110	900	105	99	88	137	688
5	*800	720	5400	6680	5160	2900	1040	107	98	88	229	1040
6	*600	738	3900	4110	5580	3560	1040	104	97	88	233	1040
7	*1000	972	2900	3060	6120	4040	990	96	96	87	179	1080
8	*800	756	2630	2730	6030	3700	954	100	97	86	181	1040
9	756	846	2370	2590	6490	3060	828	103	98	85	187	864
10	738	1610	2320	2950	7250	2730	656	96	96	85	188	972
11	738	1140	2590	3360	7530	2680	483	101	96	85	166	972
12	436	1270	2320	3000	8640	3060	242	98	96	85	173	972
13	280	1020	2320	2540	9330	1060	238	101	96	85	177	1010
14	738	828	2640	2410	8090	4320	254	100	93	85	181	1010
15	900	828	2500	2680	6120	5000	153	99	90	85	177	262
16	864	1120	2190	2900	5490	3970	136	98	90	85	173	972
17	774	1080	2190	2900	6120	3420	115	100	90	85	172	1040
18	774	1040	2450	2590	7060	3000	109	104	90	85	173	1010
19	738	1020	2500	2320	6490	1020	109	104	89	85	169	1010
20	436	1320	2500	2040	5080	608	112	103	88	85	160	1120
21	792	1490	2320	2110	4840	792	108	109	87	85	154	223
22	1040	1820	2070	1920	5940	2360	106	115	87	85	242	125
23	1270	1920	1880	1740	7060	2320	108	118	87	85	258	792
24	1250	2680	2070	1840	7250	1660	106	102	86	87	256	1010
25	1100	3060	1920	1880	7150	1680	105	102	85	88	193	972
26	954	2500	1700	2040	7060	792	102	102	86	88	231	302
27	720	2190	1740	2190	6300	576	107	101	86	88	177	972
28	1270	2030	1840	2640	5490	576	110	98	86	88	173	624
29	1250		1920	2950	4760	560	106	104	87	88	223	792
30	828		2070	3290	2790	529	105	109	87	88	262	1760
31	990		1920		3360		104	104		96		2000
Mean	846	1340	2960	2720	5900	2490	367	103	92	87	185	855
Ac.Ft. for Month	52040	74200	182000	162000	363000	148000	22600	6340	5490	5320	11000	52600

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision), Oakdale and South San Joaquin Irrigation Districts. Station is at mile 32.0 above mouth.

* Discharge estimated from Orange Blossom Station.

TABLE 41

DISCHARGE OF STANISLAUS RIVER AT RIPON BRIDGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	970	1100	2290	2260	3400	3730	896	243	229	245	276	379
2	776	920	4130	2560	3290	3470	824	249	278	223	291	412
3	824	730	5810	2840	3470	3920	872	258	265	232	335	423
4	1070	776	7150	2660	3880	4170	1040	258	240	229	390	512
5	1070	753	5610	3800	4400	3840	1280	249	207	216	423	848
6	824	730	4440	4980	4780	3470	1280	262	205	229	489	945
7	800	896	3470	4090	5220	3880	1230	236	218	232	512	995
8	896	824	3000	3230	5610	4130	1120	216	240	225	489	995
9	776	730	2750	2940	5710	3800	1020	212	216	218	489	920
10	730	1280	2350	2900	6280	3190	896	232	214	221	489	945
11	730	1460	2780	3330	6960	2940	776	207	203	229	489	995
12	638	1380	2620	3360	7540	3060	615	232	205	218	467	995
13	500	1280	2410	3030	9000	2290	523	236	196	238	489	1020
14	534	945	2620	2560	9210	2560	580	247	216	243	489	995
15	872	872	2750	2970	7740	4440	456	238	229	269	500	707
16	824	945	2530	3120	6020	4590	434	225	218	291	500	753
17	800	970	2290	3290	5610	4050	390	238	201	302	500	1020
18	753	1170	2530	3160	6280	3540	335	232	210	271	500	1040
19	753	970	2620	2940	6960	2350	313	232	207	245	500	1020
20	661	1120	2690	2750	6140	1250	324	256	210	249	500	1020
21	638	1280	2590	2410	5220	1120	324	265	240	254	489	707
22	945	1550	2380	2620	5060	2040	302	254	232	265	478	434
23	1070	1630	2230	2170	5910	2440	269	269	232	256	534	638
24	1020	1880	2080	2200	6960	2020	269	249	254	258	569	970
25	1070	3030	2320	2230	7340	2050	291	254	271	273	569	1020
26	920	2660	2020	2290	7340	1600	278	236	229	265	523	661
27	848	2290	1940	2500	6960	1120	291	245	260	276	546	848
28	1040	2080	2080	2590	6140	1040	291	210	251	280	434	730
29	1150		2110	3030	5610	1100	273	225	243	291	379	707
30	896		2200	3260	4490	1070	275	229	251	280	390	1380
31	872		2170		3580		251	232		273		1820
Mean	847	1295	2934	2938	5875	2809	591	240	229	251	468	866
Ac.Ft. for Month	52100	71900	180400	174800	361200	167100	36300	14700	13600	15500	27800	53300

NOTE: Station maintained jointly by Division of Water Resources (Water Supervision), Water Resources Branch of U.S.Geological Survey, City of San Francisco, U. S. Bureau of Reclamation and the South San Joaquin & Modesto Irrigation Districts. Station is at Highway 99 and is 16 miles above mouth of river.

TABLE 42

DISCHARGE OF STANISLAUS RIVER AT BRET HARTE PUMP - 1941

Day	Daily Discharge in Second-Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1040	1015	2000	2175	3435	3535	1000	278	360	255	330	445
2	905	985	3330	2360	3335	3290	950	283	345	250	320	445
3	785	820	4445	2575	3390	3505	910	295	355	250	355	450
4	990	720	5875	2555	3635	3745	920	302	337	265	395	480
5	1040	780	5945	2875	3910	3735	980	294	290	260	430	820
6	985	725	4920	3515	4160	3290	1055	305	262	270	475	1050
7	775	810	3900	3735	4420	3635	1060	275	265	280	515	1105
8	920	845	3425	3040	4850	3920	1005	265	325	235	495	1140
9	825	745	3140	2810	5160	3790	935	275	263	230	480	1080
10	750	1035	2785	2705	5375	3490	850	305	263	200	480	995
11	720	1375	2895	2930	5965	2875	790	295	260	220	490	1015
12	685	1215	2725	3065	6470	2900	705	292	258	230	460	1000
13	535	1275	2380	2900	7315	2695	625	290	252	280	475	1000
14	455	825	2410	2535	8185	2245	600	287	265	275	480	1000
15	760	750	2450	2700	7590	3965	540	287	287	320	480	995
16	800	825	2345	2915	6080	4500	490	280	272	330	475	595
17	795	980	2125	3025	5245	4220	465	335	257	290	475	970
18	750	1255	2200	2990	5375	3685	417	333	262	290	475	1055
19	735	1460	2270	2890	6410	2910	393	330	264	280	470	1020
20	710	1565	2335	2745	6425	1835	375	320	262	310	470	1015
21	605	1620	2300	2484	5355	1675	360	340	280	310	460	900
22	825	1665	2230	2670	4580	2020	340	330	265	335	445	510
23	1085	1725	2095	2290	4880	2685	335	317	258	310	515	490
24	1040	1790	1985	2215	5970	2255	327	380	256	310	560	870
25	1120	2365	2205	2265	6640	2145	323	350	267	320	560	985
26	950	2650	2035	2330	6825	1835	317	338	255	295	535	875
27	910	2535	1930	2525	6705	2070	350	339	257	350	545	640
28	910	2040	2010	2580	6250	2605	348	325	275	345	460	850
29	1105		2065	2985	5675	1125	325	295	258	355	360	645
30	1010		2110	3245	5025	1050	308	272	257	350	415	1025
31	880		2180		3625		295	350		330		1500
Mean	852	1300	2808	2754	5428	2908	603	308	270	288	463	867
Ac.Ft.for Month	52360	72190	172700	163900	333700	173000	37080	18970	16530	17710	27530	53300
Diversions Below Station, Ac.Ft.	0	0	0	0	20	400	300	250	170	60	0	0
*Discharge to San Joaquin River, Ac.Ft.	52360	72190	172700	163900	333700	172600	36780	18720	16360	17650	27530	53300

NOTE: Recording gage station maintained jointly by Division of Water Resources, U. S. Bureau of Reclamation, City of San Francisco and Modesto Irrigation District. Station is 5.9 miles above mouth of river.

*Neglecting seepage return below station.

CHAPTER III

MEASUREMENTS OF DIVERSIONS

Measurements and records of diversions in 1941 have included those from the Sacramento River and its tributaries on the valley floor, those to the Delta Uplands from Old San Joaquin River, Tom Paine Slough, and San Joaquin River, and those on the Stanislaus, Tuolumne, Merced, (below the major irrigation districts gravity diversions) and San Joaquin (above Durham Ferry Bridge) rivers as obtained in connection with the return water measurements (See Chapter IV). For 1941 this report records a total of 658 points of diversion, segregated to the various sources as follows: Sacramento River 286, Colusa Trough 14, Back Borrow Pit (darrying drainage water from Colusa Basin along the back levees of Reclamation Districts 108 and 787) 20, Lower Butte Creek and Butte Slough 23, By-Pass and Drainage Channels 43, Feather River 37, Yuba River 9, American River 35, from Old San Joaquin River 13, from Tom Paine Slough 8, and from San Joaquin River (below Vernalis gaging station) 48, San Joaquin River (above Vernalis gaging station) 21, Stanislaus River 25, Tuolumne River 21, and Merced River 55.

All of these diversions except four are accomplished by pumping. The four exceptions are gravity diversions, one on the Yuba River, two on the Feather River and one on the Sacramento River, the records for which are obtained by means of canal ratings. In the case of the pumping diversions there are a few instances where the records are obtained by means of canal ratings, but in the main the records are obtained from a relation established between electric power consumption, static head and pump discharge. This is possible due to the fact that nearly all of the pumping

plants are electrically operated. The relation between power input and water pumped is determined from current meter measurements of the discharge and the measured kilowatt input. At the larger pumping plants several measurements are made during each season. At the smaller plants a number of measurements are made initially to determine the rating and thereafter at intervals to show any changes which may occur in the rating. Prior to 1933 a daily diversion record for each plant was compiled. However, since that year, except for the larger diversions, the monthly diversion records only are available.

For 1941 the amount of water diverted by the larger plants was computed, as above, and several discharge measurements were made at each of the larger plants during the season. Due to the intermittent operation of the smaller plants and the large area to be covered by the field engineers, it was not possible to make many discharge measurements at any one of these smaller plants. However, it is felt that possibly the rating as initially determined, remains more or less constant and that over a period of time, enough measurements will be secured to determine any change in the rating. The diversions for 1941 have been computed on a monthly basis only and the breakdown into daily records was not made.

A summary of the 1941 diversions throughout the Sacramento-San Joaquin territory is shown in Table 61. A segregation is made to show the relative diversions from the various river sources. For each segregation the table shows also the acreage irrigated and the computed seasonal gross duty of water. Table 61A shows a comparison of the rice acreage served during the period 1924 - 1941, from the stream channels in the Sacramento-San Joaquin Valley area under water supervision, with the rice acreage in California served from all sources and reported by the Federal-State

Crop Reporting Service. Table 60 summarizes the diversions and irrigated acreages between different points on the Sacramento River. Table 43 shows a comparison of the Sacramento River stream flow irrigation draft and gross duty of water for the years 1924 to 1941, inclusive. Tables 44, 45 and 46 shows similar data for the Feather, Yuba and American rivers. In Table 47 is shown the average monthly diversions in per cent of seasonal for the streams in the Sacramento and San Joaquin Valleys. A summary of the monthly diversions from the Sacramento Valley streams for the period of record prior to 1941 is given in Tables 48 to 51. All data available since 1924 regarding monthly diversions, acreage irrigated, and gross duty of water for the San Joaquin Valley streams and Delta Upland channels are given in Tables 52 to 58. Table 59 shows, for the Sacramento River only, the seasonal diversions and acreages irrigated for the period 1924-1941, segregated to the different river sections.

TABLE 43

SACRAMENTO RIVER - REDDING TO SACRAMENTO
STREAM FLOW - IRRIGATION DRAFT - GROSS DUTY OF WATER 1924 - 1941

Year	Seasonal Runoff at Red Bluff in Per cent of normal *	Discharge of Sacramento River at Kennett Cubic feet per Sec. Average July -Sep. Inclusive	Discharge of Sacramento River at Kennett Cubic feet per Sec. Average July	Irrigation Draft Aver. cfs July-Sep. Inclusive	Irrigation Draft Acre-feet Mar.-Oct. Inclusive	Acreage Irrigated General	Acreage Irrigated Rice	Acreage Irrigated Total	Gross Duty of Water Acre-feet per Acre Jul.-Sep. Inclusive	Gross Duty of Water Acre-feet per Acre July	Gross Duty of Water Acre-feet per Acre Mar.-Oct. Inclusive	Gross Duty of Water Acres per sec. foot Mar.-Oct. Inclusive	Gross Duty of Water Acres per sec. foot July-Sep. Inclusive
1924	38	2920**	2890**	2470**	953000	104300	59700	164000	2.75	1.15	5.81	84	66
1925	92	3630**	3640**	2960**	843000/	76200	58000	134200	4.03	1.57	6.28	77	45
1926	65	2780	2880	3210	1108000/	76600	87500	164100	3.57	1.58	6.75	72	51
1927	125	3550	3950	3510	1159000/	77900	79800	157700	4.07	1.60	7.35	66	45
1928	87	3320	3580	2920	1055000/	88200	63500	151700	3.52	1.49	6.95	70	52
1929	50	2920	3060	2770	1066000/	136900	43900	180800	2.80	1.15	5.90	83	65
1930	70	2970	3070	2880	1056000/	96600	56200	152800	3.44	1.42	6.91	70	53
1931	38	2570	2600	3030	1335000	141500	73900	215400	2.57	1.13	6.20	78	71
1932	58	2730	2940	2570	1020000	130700	53800	184500	2.54	1.07	5.53	88	72
1933	52	2770	3010	2680	1042000	101100	53000	154100	3.17	1.28	6.76	72	57
1934	51	2540	2650	2750	1057000	93800	56500	150300	3.34	1.35	7.03	69	54
1935	86	3010	3330	2820	926000	98500	51100	149600	3.44	1.38	6.19	78	53
1936	81	2910	3280	2890	1055000	93100	62700	155800	3.38	1.39	6.77	72	54
1937	68	2950	3380	3210	1070000	101000	66500	167500	3.50	1.41	6.39	76	52
1938	168	4220	4870	2990	932000	85600	62600	148200	3.68	1.47	6.29	77	49
1939	50	3000	3100	2910	1301000	158800	63900	222700	2.38	1.03	5.84	83	77
1940	120	3425	3625	3275	1063000	119700	64400	184100	3.25	1.35	5.77	84	56
1941	164	4500	5180	3850	1150000	118600	85200	203800	3.44	1.31	5.64	86	53
Average 1924-1941		3150	3390	2980	1066200	105500	63500	169000	3.21		6.31	77	57

* 50 year mean (1889-1939) of natural run-off. See Table 1, 2 & 3 for comparison of 40 and 50 year means.
**Flow near Red Bluff. Station at Kennett established in 1926.
/ Diversions for March estimated.

TABLE 44

FEATHER RIVER - OROVILLE TO MOUTH
STREAM FLOW - IRRIGATION DRAFT - GROSS DUTY OF WATER 1924 - 1941

Year	Seasonal Runoff at Oroville in Per cent of Normal *	Discharge of Feather River at Oroville Cubic Feet per Sec. Average July-Sep. Inclusive	Discharge of Feather River at Oroville Cubic Feet per Sec. Average July	Irrigation Draft Aver. cfs July-Sep. Inclusive	Irrigation Draft Acre-feet Mar.-Oct. Inclusive	Acreage Irrigated General	Acreage Irrigated Rice	Acreage Irrigated Total	Gross Duty of Water Acre-feet per Acre July-Sep. Inclusive	Gross Duty of Water Acre-feet per Acre July	Gross Duty of Water Acre-feet per Acre Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. Ft. Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. Ft. July-Sep. Inclusive
1924(1)	27	933	852	917	355346	22402	22541	44943	3.72	1.30	7.92	61	49
1925	65	1719	1770	1287	417150	25560	26734	52294	4.49	1.72	7.98	61	41
1926	65	1839	1840	1432	474025	23545	34694	58239	4.49	1.81	8.14	60	41
1927	121	1920	2110	1578	533615	24944	38513	63457	4.54	1.80	8.41	58	40
1928	88	1689	1980	1363	497201	23383	33145	56528	4.40	1.85	8.80	55	41
1929	38	2080	1920	1134	453464	29011	23917	52928	3.91	1.64	8.57	57	47
1930	80	1986	1890	1225	450020	25604	24258	49862	4.48	1.87	9.03	54	41
1931	30	1177	1230	1059	464138	24683	27079	51762	3.73	1.58	8.97	54	49
1932	68	1570	1990	1327	496713	24115	28108	52223	4.64	1.91	9.51	51	39
1933	39	1389	1590	1286	478326	21897	26541	48438	4.84	1.95	9.88	49	38
1934	42	1445	1530	1085	428008	23984	24918	48902	4.05	1.67	8.75	56	45
1935	88	1937	2067	1258	390873	25162	20849	46001	4.99	2.01	8.50	57	37
1936	88	2171	2242	1349	479093	23990	26546	50536	4.87	1.96	9.48	51	37
1937	65	1760	2138	1529	507765	26705	30203	56908	4.90	1.93	8.92	54	37
1938	175	2674	3334	1594	512600	26938	27144	54082	5.38	2.00	9.48	51	34
1939	39	1516	1460	1168	501357	29234	26303	55537	3.84	1.66	9.03	54	48
1940	116	1966	1913	1414	473974	30117	23526	53643	4.81	1.96	8.84	55	34
1941	133	2229	2754	1547	475240	27658	26640	54298	5.20	1.90	8.75	56	35
Average 1924 - 1941		1780	1920	1300	466000	25500	27310	52810	4.49		8.83	55	41

*50 year mean (1889 - 1939) of natural runoff. See tables 1, 2 & 3 for comparison of 40 and 50 year means.
(1) Some of the smaller plants were omitted in 1924.

TABLE 45

YUBA RIVER - SMARTVILLE TO MOUTH
STREAM FLOW - IRRIGATION DRAFT - GROSS DUTY OF WATER 1925 - 1941

Year	Seasonal Runoff at Smartville in Per cent of Normal *	Discharge of Yuba River at Smartville Cubic feet per Sec. Average July-Sep. Inclusive	Discharge of Yuba River at Smartville Cubic feet per Sec. Average July	Irrigation Draft Aver. cfs July-Sep. Inclusive	Irrigation Draft Acre-feet Mar.-Oct. Inclusive	Acreage Irrigated General	Acreage Irrigated Rice	Acreage Irrigated Total	Gross Duty of Water Acre-feet per acre July-Sep. Inclusive	Gross Duty of Water Acre-feet per acre July	Gross Duty of Water Acre-feet per acre Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. ft. Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. ft. July-Sep. Inclusive
1925(1)	85	417	637	10	4045	1796	0	1796	1.01	0.55	2.25	217	180
1926	65	226	280	133	35908	3234	3279	6513	3.73	1.37	5.51	88	49
1927	142	495	868	125	39750	4003	1930	5933	3.84	1.66	6.71	73	47
1928	98	374	546	114	36800	4935	1875	6810	3.04	1.42	5.40	90	60
1929	41	252	340	139	53254	5180	2450	7630	3.33	1.23	6.99	69	55
1930	73	296	347	163	58521	4680	2875	7555	3.93	1.56	7.74	63	46
1931	26	146	152	134	63320	4823	2950	7773	3.14	1.16	8.14	60	58
1932	85	359	603	137	58201	4950	2615	7565	3.32	1.26	7.70	63	55
1933	43	293	420	162	63369	5935	2645	8580	3.46	1.27	7.38	66	53
1934	40	185	222	127	52651	6305	1667	7972	2.91	1.40	6.51	74	63
1935	90	383	602	153	48850	6535	1552	8087	3.46	1.40	6.05	80	53
1936	104	394	584	155	64058	5202	2665	7867	3.58	1.31	8.14	60	51
1937	75	360	541	156	59163	6699	2598	9297	3.06	1.05	6.37	76	60
1938	162	748	1410	152	43257	5772	1605	7377	3.75	1.35	5.88	83	49
1939	36	213	238	186	73113	6642	1898	8540	3.97	1.51	8.56	57	46
1940	115	342	390	207	69968	7220	1270	8490	4.45	1.79	8.24	59	41
1941	129	787	1565	206	73530	7472	1345	8817	4.27	1.54	8.34	58	43
Average 1925 - 1941		368	573	145	52790	5375	2072	7477	3.54		7.06	69	52

*50 year mean (1889 - 1939) of natural run-off. See Tables 1, 2 and 3 for comparison of 40 and 50 year means.
(1) Record obtained for Lower Yuba River only.

TABLE 46

AMERICAN RIVER - FAIROAKS TO MOUTH
STREAM FLOW - IRRIGATION DRAFT - GROSS DUTY OF WATER 1925 - 1941.

Year	Seasonal Runoff at Fairoaks in per cent of Normal *	Discharge of American River at Fairoaks Cubic feet per Sec. Average July-Sep. Inclusive	Discharge of American River at Fairoaks Cubic feet per Sec. Average July	Irrigation Draft Aver. cfs July-Sep. Inclusive	Irrigation Draft Acre-feet Mar.-Oct. Inclusive	Acreage Irrigated General	Acreage Irrigated Rice	Acreage Irrigated Total	Gross Duty of Water Acre-feet per acre July-Sep. Inclusive	Gross Duty of Water Acre-feet per acre July	Gross Duty of Water Acre-feet per acre Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. Ft. Mar.-Oct. Inclusive	Gross Duty of Water Acres per Sec. Ft. July-Sep. Inclusive
1925	94	565	1080	16	4353	3510		3510	0.82	0.35	1.24	392	219
1926	48	207	247	16	4606	3073		3073	0.94	0.50	1.50	324	192
1927	127	653	1240	21	5636	3343		3343	1.16	0.52	1.68	288	159
1928	88	286	414	17	5635	3071		3071	1.00	0.41	1.83	264	181
1929	40	262	482	20	6324	3077		3077	1.20	0.50	2.04	239	154
1930	57	276	414	15	4955	2639		2639	1.06	0.49	1.87	262	176
1931	25	98	136	15	5620	2694		2694	1.03	0.46	2.09	232	179
1932	90	679	1500	17	5481	3165		3165	.96	0.42	1.73	281	187
1933	44	344	633	15	4651	2848		2848	.94	0.46	1.62	300	190
1934	39	179	192	15	5505	2770		2770	.98	0.46	1.99	245	185
1935	90	504	1009	15	4815	2808		2808	.97	0.46	1.71	284	187
1936	118	753	1364	16	4727	2492		2492	1.16	0.49	1.90	256	156
1937	81	497	873	20	5381	3353		3353	1.07	0.45	1.61	302	168
1938	157	1060	2101	16	4287	2923		(1)2923	1.03	0.43	1.47	331	182
1939	36	127	165	19	6654	3064		(1)3064	1.11	0.55	2.17	224	161
1940	118	511	734	19	6052	3061		(1)3061	1.15	0.58	1.98	245	159
1941	109	715	1319	19	5309	3046		(1)3046	1.12	0.50	1.74	279	160
Average 1925-1941		454	818	17	5294	2996		2996	1.04		1.77	275	176

*50 year mean (1889-1939) of natural run-off. See tables 1, 2 & 3 for comparison of 40 and 50 year means,
(1) An estimated 2200 acres have been added for Carmichael Irrigation District.

TABLE 47

AVERAGE MONTHLY DIVERSIONS IN PER CENT OF SEASONAL FOR SACRAMENTO AND SAN JOAQUIN VALLEY STREAMS

	Period of Record	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.
SACRAMENTO VALLEY		Per Cent of Seasonal Diversion							
Sacramento River - Redding to Sacramento	1924 to 1941	0.8	7.3	17.6	19.7	21.0	19.3	10.7	3.6
Feather River - Oroville to mouth	1924 to 1941	0.3	5.5	18.4	19.6	20.6	19.2	11.6	4.8
Yuba River - Smartville to mouth	1925 to 1941	--	8.3	17.0	18.8	19.4	18.2	12.4	5.9
American River - Fairoaks to mouth	1925 to 1941	0.6	4.7	10.4	20.2	26.7	20.5	11.6	5.3
DELTA UPLANDS									
Old San Joaquin River	1924 to 1941	2.7	9.3	17.3	17.8	20.3	17.0	11.2	4.4
Tom Paine Slough	1924 to 1941	1.6	7.8	15.2	17.1	18.5	17.9	14.3	7.6
San Joaquin River below Vernalis	1924 to 1941	2.9	12.5	16.1	13.6	24.0	18.5	8.8	3.6
SAN JOAQUIN VALLEY									
San Joaquin River - Delta Bridge to Vernalis	1931 to 1941	3.2	10.3	14.7	15.7	22.5	18.6	11.3	3.7
Merced River - Yosemite Valley Railroad Crossing to mouth	1931 to 1941	1.7	7.6	15.0	18.6	21.7	18.8	12.4	4.2
Tuolumne River - La Grange to mouth	1931 to 1941	2.3	7.7	17.0	17.8	20.2	18.4	11.5	5.1
Stanislaus River - Orange Blossom Bridge to mouth	1931 to 1941	1.1	8.5	14.0	19.1	21.2	19.2	11.6	5.3

TABLE 48

SACRAMENTO RIVER - MONTHLY DIVERSIONS IN ACRE-FEET - SACRAMENTO TO REDDING 1924 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion
1924	7324	102511	184043	186073	189081	163677	97976	22088	952773
1925	1200*	11177	87709	184151	211788	194888	134442	18108	843463
1926	4000*	34326	195052	258889	259777	226874	98632	30220	1107770
1927	600*	31327	206864	234116	260018	241876	139469	44993	1159263
1928	1900*	52335	207747	229261	227058	214549	92114	29574	1054538
1929	5600*	138283	204360	167378	207785	191346	107103	43954	1065809
1930	3100*	74236	198836	221852	217698	199875	107577	32681	1055855
1931	30199	222932	257156	227158	242076	209351	101822	44572	1335266
1932	4661	123973	176667	194500	197849	171122	99657	51571	1020000
1933	4452	118677	188004	189852	197452	185945	105071	52267	1041720
1934	2599	109638	204710	193469	202843	191488	107885	44331	1056963
1935	1524	18598	157817	203562	206813	195215	112498	30137	926164
1936	7320	76534	203802	194110	216217	206858	104203	45925	1054969
1937	3459	32727	210339	210927	235304	217924	133271	26510	1070461
1938	5285	29942	121847	199745	218572	208414	118177	30248	932230
1939	63636	202428	227491	233319	230319	209735	90708	43412	1301048
1940	1802	18073	182534	218505	249012	228765	119951	43988	1062630
1941	1883	5274	157567	228387	265229	259557	177189	55029	1150115
Average Acre-feet	8360	77940	187360	209740	224160	206530	113760	38310	1066200
Average c.f.s.	136	1310	3047	3525	3646	3359	1912	623	2194
Monthly Diversion in per cent of Seasonal	0.8	7.3	17.6	19.7	21.0	19.3	10.7	3.6	

*Estimated.

TABLE 49

FEATHER RIVER - MONTHLY DIVERSIONS IN ACRE FEET - OROVILLE TO MOUTH 1924 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversions
1924	2652	36440	75741	60132	58418	67365	41618	12980	355346
1925	0*	9506	70947	88956	90047	81340	63395	8829	413020
1926	0*	16528	83297	104100	105255	101623	54446	4083	469332
1927	0*	17522	96458	107706	114211	102251	71514	18669	528331
1928	0*	19912	101655	109875	104359	97452	46986	12040	492279
1929	1500*	48450	97295	83570	87061	82177	37711	12711	450475
1930	0*	31719	78154	91418	93250	89300	40912	20811	445564
1931	5887	67203	98054	85024	81941	71953	39288	14788	464138
1932	2158	50002	85950	94140	99640	93180	49359	22284	496713
1933	5388	31219	91529	91635	94231	85891	54515	23918	478326
1934	2245	34217	92225	82379	81467	72334	44121	19020	428008
1935	214	1538	51974	89713	92372	85835	51342	17885	390873
1936	768	14136	92675	92002	99147	90575	56374	33416	479093
1937	620	5647	92614	99882	109850	103248	65946	29958	507765
1938	0	3512	76975	98534	108039	104846	77969	42725	512600
1939	3583	71539	99567	90960	92044	83292	37752	22620	501357
1940	188	2207	84408	95502	105337	93454	59182	33695	473973
1941	0	2448	70513	72971	103334	100433	78451	47090	475240
Average Acre-feet	1400	25760	25560	91030	95560	89250	53940	22080	464580
Average C.F.S.	23	433	1392	1530	1554	1452	906	359	956
Monthly Diversion in per cent of seasonal	0.3	5.5	18.4	19.6	20.6	19.2	11.6	4.8	

*Estimated.

TABLE 50

YUBA RIVER - MONTHLY DIVERSIONS IN ACRE-FEET - SMARTVILLE TO MOUTH 1925 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion
1925	-	-	617	1594	985	586	249	14	4045
1926	0	0	4681	6825	8893	10785	4604	120	35908
1927	-	304	6492	9761	9808	8733	4220	432	39750
1928	0	0	7329	8759	9651	8816	2245	0	36800
1929	0	3972	10808	8843	9376	8710	7308	4237	53254
1930	0	4803	9234	10293	11752	10825	7137	4477	58521
1931	0	10471	12111	10427	8991	8986	6468	5866	63320
1932	0	8778	10151	9973	9525	9188	6371	4215	58201
1933	0	7617	11048	10516	10917	10920	7724	4627	63369
1934	0	7112	11137	10985	11235	8454	3496	232	52651
1935	0	525	9034	11008	11313	10013	6674	283	48850
1936	0	9709	11579	10513	10330	10009	7908	4010	64058
1937	0	8093	9913	10055	9749	9815	8835	2703	59163
1938	0	360	4807	9371	9982	9433	8284	1020	43257
1939	176	8986	13174	12890	12889	12739	8304	3955	73113
1940	0	1326	9377	14114	15190	11798	10780	7383	69968
1941	0	2624	10589	13076	13574	13419	10672	9576	73530
Average Acre-feet	10	4393	8946	9941	10245	9602	6546	3126	52809
Average c.f.s.	0.2	74	145	167	167	156	110	51	109
Monthly Diversion in per cent of seasonal	--	8.3	17.0	18.8	19.4	18.2	12.4	5.9	

TABLE 51

AMERICAN RIVER - MONTHLY DIVERSIONS IN ACRE-FEET - FAIROAKS TO MOUTH 1925 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion
1925	10*	66	261	985	1233	1198	458	142	4353
1926	0*	5	390	1162	1519	894	480	156	4606
1927	5*	16	317	1028	1754	1577	529	410	5636
1928	10*	121	580	1406	1263	965	832	458	5635
1929	50*	482	812	936	1539	1280	864	361	6324
1930	30*	317	436	1250	1302	976	504	140	4955
1931	46	469	1127	916	1237	1027	510	288	5620
1932	39	390	598	1116	1317	1164	556	301	5481
1933	0	106	471	1070	1317	924	424	303	4615
1934	63	431	896	1078	1281	806	624	326	5505
1935	5	338	663	893	1289	824	603	200	4815
1936	44	312	355	786	1208	1005	667	350	4727
1937	3	119	329	1082	1518	1252	797	281	5381
1938	0	100	267	824	1256	1117	635	88	4287
1939	73	380	932	1616	1699	1151	557	246	6654
1940	44	339	488	1216	1785	1038	686	456	6052
1941	150	253	379	836	1531	1202	673	285	5309
Average Acre-feet	34	250	547	1071	1415	1082	612	282	5290
Average c.f.s.	0.6	4	9	18	23	18	10	5	11
Monthly Diversion in per cent of seasonal	0.6	4.7	10.4	20.2	26.7	20.5	11.6	5.3	

*Estimated.

TABLE 52

OLD SAN JOAQUIN RIVER - DELTA UPLANDS, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1924 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated: General	Acreage Irrigated: Rice	Gross Seasonal Duty, Acre-Ft. per acre
1924	10320	10311	12600	12434	12460	10845	8277	3633	80880	29190	0	2.8
1925	100*	1737	7330	13233	16264	13962	9404	2347	64377	34677	0	1.9
1926	500*	4440	15526	17420	16690	15283	12376	2151	84386	37480	0	2.3
1927	80	1815	16312	14758	14252	12651	9398	2504	71770	35351	0	2.0
1928	500*	3430	16895	15037	14526	13701	9185	2679	75953	39924	0	1.9
1929	2000*	12977	13170	8894	14735	13143	9465	3389	77773	37359	0	2.1
1930	400*	5624	15152	14488	15289	12958	8535	3019	75465	36480	0	2.1
1931	5735	17099	10400	9245	14125	10854	3522	389	71369	34232	0	2.1
1932	296	5460	9318	9343	9803	8379	5718	2636	50953	27942	0	1.8
1933	488	10114	10351	10092	10938	10414	6082	3463	61942	27851	0	2.2
1934	3204	14687	10321	8708	12827	9946	5817	3019	68529	29792	0	2.3
1935	10	30	11027	13473	12973	10171	6933	2082	56699	28307	0	2.0
1936	420	5310	12235	8621	14492	9994	6958	5239	63269	30232	0	2.1
1937	3	2621	13418	11093	13590	11934	7100	4853	64612	31913	0	2.0
1938	0	1313	8628	11989	9806	8841	6250	3566	50393	29658	0	1.7
1939	7728	12880	8746	12055	13453	9855	4977	1669	71363	34956	0	2.0
1940	0	1015	9527	10943	14091	10217	6148	3306	55247	29009	0	1.9
1941	0	447	5492	11541	13087	10009	7382	2909	50867	28842	0	1.8
Average	1770	6180	11470	11850	13520	11290	7420	2940	66440	32400	0	2.1
Average c.f.s.	29	104	187	199	220	184	125	48	137			
Monthly Diversion in per cent of seasonal	2.7	9.3	17.3	17.8	20.3	17.0	11.2	4.4				

*Estimated

TABLE 53

TOM PAINE SLOUGH - DELTA UPLANDS, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1924 - 1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated: General	Acreage Irrigated: Rice	Gross Seasonal Duty, Acre-ft.per acre
1924	1126	1926	2529	2696	2238	2419	1474	1242	15650	2810	0	5.6
1925	0*	500*	1672	3491	3027	3058	2205	933	14886	7441	0	2.0
1926	100*	926	3676	3095	3238	2903	2507	693	17138	4973	0	3.4
1927	0*	94	3700	2911	3099	3166	2630	1655	17255	6157	0	2.8
1928	200*	785	2111	2589	2456	2353	2497	1649	14640	4906	0	3.0
1929	500*	1554	2376	1642	3028	2814	2100	1154	15168	5195	0	2.9
1930	100*	764	2081	2132	2326	2124	1752	960	12239	4987	0	2.5
1931	530	2109	1324	1602	2325	2286	1981	523	12680	5322	0	2.4
1932	67	1809	926	1883	1952	2068	1894	775	11374	5040	0	2.3
1933	0	1306	1608	1775	1715	1898	1543	1351	11196	4450	0	2.5
1934	70	2069	1272	1433	1936	1616	1578	972	10946	4549	0	2.4
1935	0	0	1593	1917	1797	1026	1241	556	8930	3226	0	2.8
1936	38	990	1680	1670	2469	2373	1709	1308	12237	4450	0	2.7
1937	0	112	1545	1864	2173	2041	1426	503	9664	3302	0	2.9
1938	0	432	1219	1364	1296	1497	1062	427	7297	2887	0	2.5
1939	763	1620	1218	1703	1414	1789	1015	645	10167	3911	0	2.6
1940	0	159	1509	1974	2129	1612	1133	873	9389	4007	0	2.3
1941	0	0	1406	1972	2163	1788	1704	529	9562	3963	0	2.4
Average	194	953	1860	2100	2270	2200	1750	930	12250	4530	0	2.7
Average c.f.s.	3	16	30	35	37	36	29	16	25			
Monthly Diversion in per cent of seasonal	1.6	7.8	15.2	17.1	18.5	17.9	14.3	7.6				

- *Estimated

TABLE 54

SAN JOAQUIN RIVER - DELTA UPLANDS, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1924-1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated		Gross Seasonal Duty, Acre-ft. per acre
										General	Rice	
1924	614	1126	1760	1889	2175	1819	1385	206	10974	4335	0	2.5
1925	0*	6	276	1149	1530	1694	1040	39	5734	3224	0	1.8
1926	2000*	5657	8800	7696	8251	7693	6308	1577	47982	11196	0	4.3
1927	0*	713	8530	8224	8927	9378	4317	746	40835	12870	0	3.2
1928	1000*	3075	7915	7523	9141	8159	4604	1849	43266	17579	0	2.5
1929	2000*	6747	9600	5497	10594	7624	4498	2586	49146	16941	0	2.9
1930	2000*	6823	11848	7555	12899	11800	4227	1357	58409	18486	0	3.2
1931	3009	9378	8007	5475	12617	11759	4141	2126	56512	17021	0	3.3
1932	1452	8519	5767	5133	9972	7349	4365	1704	44261	19088	0	2.3
1933	767	9174	6089	5799	10703	7581	3165	2099	45377	18025	0	2.5
1934	3744	10633	7861	5411	12805	8682	4068	1965	55169	19372	0	2.8
1935	12	1691	6790	8950	10353	7785	3637	1714	40932	16571	0	2.5
1936	1483	7467	6838	4166	11651	8629	3575	1865	45674	18993	0	2.4
1937	3	5355	6512	4285	12542	7737	2824	1970	41228	19648	0	2.1
1938	1	3062	6753	4154	9943	6622	3004	991	34530	17582	0	2.0
1939	4012	9394	5398	6901	11721	8744	3862	1178	51210	18672	0	2.7
1940	4	4638	6974	7011	12805	7978	3300	1932	44642	18457	0	2.4
1941	4	1086	6162	5944	12007	8735	4384	1762	40084	19298	0	2.1
Average	1230	5250	6770	5710	10040	7760	3710	1530	42000	15960	0	2.6
Average c.f.s.	20	88	110	96	163	126	62	25	86			
Monthly Diversion in per cent of seasonal	2.9	12.5	16.1	13.6	24.0	18.5	8.8	3.6				

*Estimated

TABLE 55

SAN JOAQUIN RIVER - FREMONT FORD BRIDGE TO VERNALIS, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1928-1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated		Gross Seasonal Duty, Acre-ft. per acre
										General	Rice	
1928	*	*	*	*	11854	10574	8925	*	*	*	*	*
1929	*	*	*	*	12814	11021	10790	*	*	*	*	*
1930	*	12970	15632	15951	16472	16921	10860	1654	90460	*	*	*
1931	8084	18145	14765	14752	19847	15593	9607	5203	105996	34894	500	3.0
1932	3510	16745	11018	11802	15571	14886	11562	5010	90104	39813	80	2.3
1933	5496	14431	11244	11762	19043	18373	11437	3795	95581	35036	0	2.7
1934	5935	21809	17152	12615	24787	22392	12880	3123	120693	41696	290	2.9
1935	595	1228	14156	18502	23647	22541	13284	5211	99164	37320	155	2.6
1936	4511	12744	15608	21854	23594	15879	10614	3729	108533	41862	160	2.6
1937	212	3100	17198	16112	25933	21963	12183	3295	99996	41542	230	2.4
1938	69	4378	17054	15089	21991	17576	10842	2767	89766	42226	200	2.1
1939	7044	17485	17212	18955	25161	21288	10366	2505	120016	42379	420	2.8
1940	555	4547	15524	18950	26396	17707	10769	3365	97813	39373	470	2.5
1941	0	302	13633	15486	26484	20840	12725	3947	93417	39866	484	2.3
Average**	3270	10450	14960	15990	22950	19000	11480	3810	101900	39640	272	2.6
Average c.f.s. **	53	176	243	269	373	309	193	62	271			
Monthly ** Diversion in per cent of seasonal	3.2	10.3	14.7	15.7	22.5	18.6	11.3	3.7				

*No Record
**1931 to 1941.
NOTE: No records prior to 1928.

TABLE 56

MERCED RIVER - YOSEMITE VALLEY RAILROAD CROSSING TO MOUTH, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1828-1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated: General	Acreage Irrigated: Rice	Gross Seasonal Duty, Acre-ft. per acre
1928	*	*	*	*	3451	3027	2343	*	*	*	*	*
1929	*	*	*	*	3420	2965	1942	*	*	*	*	*
1930	*	1062	2319	2750	2716	2253	1242	474	12816	*	*	*
1931	778	2836	3298	2902	3553	3232	2128	765	19492	3623	0	5.4
1932	524	1334	1808	2261	2539	2292	1787	711	13256	3299	0	4.0
1933	320	1406	1757	1990	2372	1900	1600	645	11990	3229	0	3.7
1934	627	2627	2989	2637	3202	2673	2018	826	17599	5091	0	3.5
1935	0	70	1612	2684	2764	2472	1607	632	11841	3305	0	3.6
1936	26	486	2192	2149	2426	2705	1623	411	12018	3662	0	3.3
1937	0	108	1341	2514	3114	2876	1671	387	12011	4155	0	2.9
1938	0	123	858	1523	2213	1933	1018	458	8126	3072	0	2.6
1939	38	951	1791	2162	2520	1803	808	236	10309	3478	0	3.0
1940	2	220	1541	2275	2206	1597	949	317	9107	3123	0	2.9
1941	0	0	870	1644	1995	1537	1306	236	7588	3570	0	2.1
Average**	210	924	1823	2249	2628	2275	1501	511	12120	3600	0	3.4
Average c.f.s. **	3	15	30	38	43	37	25	8	25			
Monthly** Diversion in per cent of seasonal	1.7	7.6	15.0	18.6	21.7	18.8	12.4	4.2				

*No record
**1931 to 1941
NOTE: No records prior to 1928.

TABLE 57

TUOLUMNE RIVER - LA GRANGE BRIDGE TO MOUTH, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1928-1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated		Gross Seasonal Duty, Acre-ft. per acre
										General	Rice	
1928	*	*	*	*	327	277	79	*	*	*	*	*
1929	*	*	*	*	477	338	189	*	*	*	*	*
1930	*	173	388	480	523	473	224	59	2320	*	*	*
1931	128	585	560	585	673	585	363	88	3567	894	0	4.0
1932	37	234	260	281	438	331	181	95	1857	653	0	2.8
1933	72	222	213	380	451	411	266	205	2220	855	0	2.6
1934	108	334	396	368	325	349	219	150	2249	845	0	2.7
1935	7	47	326	422	438	375	257	120	1992	770	0	2.6
1936	41	125	387	345	422	442	295	121	2178	736	0	3.0
1937	41	120	540	339	451	409	255	57	2212	752	0	2.9
1938	0	12	135	222	245	201	127	38	980	594	0	1.7
1939	160	149	414	501	455	558	193	104	2534	864	0	2.9
1940	3	19	577	415	642	436	335	151	2578	1072	0	2.4
1941	0	122	519	685	603	607	438	173	3147	1295	0	2.4
Average **	54	179	393	413	468	428	266	118	2320	848	0	2.7
Average c.f.s. **	1	3	6	7	8	7	4	2	5			
Monthly ** Diversion in per cent of seasonal	2.3	7.7	17.0	17.8	20.2	18.4	11.5	5.1				

*No records.
**1931 to 1941.
NOTE: No records prior to 1928.

TABLE 58

STANISLAUS RIVER - ORANGE BLOSSOM BRIDGE TO MOUTH, MONTHLY DIVERSIONS IN ACRE-FEET AND GROSS SEASONAL DUTY OF WATER - 1928-1941

Year	March	April	May	June	July	August	September	October	Seasonal Diversion	Acreage Irrigated		Gross Seasonal Duty, Acre-ft. per acre
										General	Rice	
1928	*	*	*	*	1248	1277	1089	*	*	*	*	*
1929	*	*	*	*	1059	807	605	*	*	*	*	*
1930	*	625	1057	1495	1336	1167	730	115	6525	*	*	*
1931	108	2023	1692	2773	2855	2449	1308	706	13914	2261	0	6.2
1932	431	1142	1529	1994	1780	1678	1216	471	10241	2522	0	4.1
1933	103	1046	1158	1355	1350	1176	684	316	7188	2021	0	3.6
1934	240	1620	1274	1687	1697	1683	780	402	9383	2122	0	4.4
1935	0	250	1177	1702	1855	1745	759	304	7792	2076	0	3.8
1936	0	727	838	1256	1952	1407	943	429	7552	2313	0	3.3
1937	0	508	1816	2248	2530	2429	1756	650	11937	3849	75	3.0
1938	0	327	735	1239	1690	1748	997	309	7045	3198	0	2.2
1939	198	1848	2201	2873	3222	3310	1752	827	16231	6331	0	2.6
1940	217	682	2143	3330	3858	2924	1741	851	15746	6902	0	2.3
1941	12	392	2696	3173	3413	3228	2466	1280	16660	6940	110	2.4
Average **	119	960	1570	2150	2380	2160	1310	595	11240	3685	17	3.0
Average ** c.f.s.	2	16	26	36	39	35	22	10	23			
Monthly ** Diversion in per cent of seasonal	1.1	8.5	14.0	19.1	21.2	19.2	11.6	5.3				

* No record

**1931 to 1941

NOTE: No records prior to 1928.

TABLE 59
SACRAMENTO RIVER - SEASONAL DIVERSIONS AND ACREAGES IRRIGATED 1924 - 1941
(SEGREGATED TO RIVER SECTIONS)

Year		River Sections							Redding to Sacramento
		Redding to Red Bluff	Red Bluff to Butte City	Butte City to Colusa	Colusa to Wilkins Slu	Wilkins Slu to Knights Ldg	Knights Ldg to Verona	Verona to Sacramento	
1924	Seasonal diversion acre-feet	99835	407427	67152	167217	99573	18422	93147	952773
	Average cubic feet per second	205	838	138	344	205	38	192	1960
	Acreage irrigated - rice	0	25875	6950	10130	11000	770	4963	59688
	Acreage irrigated - general	20020	32488	12991	19401	6093	854	12422	104269
1925	Seasonal diversion acre-feet	105593	369570	69511	179953	33822	6731	78283	843463
	Average cubic feet per second	217	761	143	370	70	14	161	1736
	Acreage irrigated - rice	0	30467	8761	9156	3054	0	6587	58025
	Acreage irrigated - general	15714	12979	7065	25408	3472	922	10662	76222
1926	Seasonal diversion acre-feet	107160	525287	134027	189515	41796	19700	90285	1107770
	Average cubic feet per second	220	1081	276	390	86	41	186	2280
	Average irrigated - rice	0	47827	14117	13214	1781	1537	9025	87501
	Acreage irrigated - general	19890	13580	7534	18778	4440	1803	10600	76625
1927	Seasonal diversion acre-feet	103248	502946	95815	233466	113750	24786	85252	1159263
	Average cubic feet per second	212	1036	197	481	234	51	175	2386
	Acreage irrigated - rice	0	37718	9110	16864	7574	2569	5926	79761
	Acreage irrigated - general	17823	17565	6445	18609	5371	1597	10451	77861
1928	Seasonal diversion acre-feet	113321	446674	68244	224477	77851	22153	101818	1054538
	Average cubic feet per second	234	919	140	461	160	46	210	2170
	Acreage irrigated - rice	0	29911	5751	14024	4865	1642	7353	63546
	Acreage irrigated - general	20789	19996	7452	21875	5889	513	11704	88218
1929	Seasonal diversion acre-feet	120150	478947	70608	205659	76003	18246	96196	1065809
	Average cubic feet per second	247	986	146	423	156	37	198	2193
	Acreage irrigated - rice	0	21680	4557	7979	4404	0	5274	43894
	Acreage irrigated - general	19105	39985	9168	45826	10859	464	11507	136914
1930	Seasonal diversion acre-feet	126760	440617	72341	229715	68169	21528	96725	1055855
	Average cubic feet per second	261	907	149	473	140	44	199	2173
	Acreage irrigated - rice	0	29199	4963	11717	3155	1130	6020	56184
	Acreage irrigated - general	14571	24068	9461	30003	7659	491	10324	96577
1931	Seasonal diversion acre-feet	143543	553663	93184	313237	70966	21506	139167	1335266
	Average subic feet per second	295	1139	192	645	146	44	286	2747
	Acreage irrigated - rice	0	39532	5462	19067	780	200	8853	73894
	Acreage irrigated - general	14538	33254	10216	54487	9706	2417	16887	141505

TABLE 59 (CONTINUED)

SACRAMENTO RIVER - SEASONAL DIVERSIONS AND ACREAGES IRRIGATED 1924 - 1941
(SEGREGATED TO RIVER SECTIONS)

Year		River Sections							
		Redding to Red Bluff	Red Bluff to Butte City	Butte City to Colusa	Colusa to Wilkins Slu	Wilkins Slu to Knights Ldg	Knights Ldg to Verona	Verona to Sacramento	Redding to Sacramento
1932	Seasonal diversion acre-feet	132035	460462	31846	249723	37791	18573	89570	1020000
	Average cubic feet per second	272	947	66	514	78	38	184	2099
	Acreage irrigated - rice	0	29673	3086	15529	0	567	968	53823
	Acreage irrigated - general	12745	52084	7387	34883	9159	4707	9782	130747
1933	Seasonal diversion acre-feet	135323	474372	33281	250149	59381	17837	71377	1041720
	Average cubic feet per second	278	975	69	515	122	37	147	2143
	Acreage irrigated - rice	0	31663	1640	15578	2126	270	2017	53294
	Acreage irrigated - general	12809	30479	4436	34925	6468	1847	10057	101021
1934	Seasonal diversion acre-feet	133625	448806	23531	243463	90826	20877	95835	1056963
	Average cubic feet per second	275	924	48	501	187	43	197	2175
	Acreage irrigated - rice	0	29153	587	15853	4497	692	5534	56516
	Acreage irrigated - general	13620	27858	4591	28934	7035	1461	10284	93783
1935	Seasonal diversion acre-feet	121974	385508	19703	225702	74302	20989	77906	926164
	Average cubic feet per second	251	794	41	464	153	43	160	1906
	Acreage irrigated - rice	0	26884	380	14462	4168	650	4546	51090
	Acreage irrigated - general	13405	28589	5142	30663	6804	1313	12577	98493
1936	Seasonal diversion acre-feet	149313	455981	36371	215313	80901	17072	100018	1054969
	Average cubic feet per second	307	937	75	443	167	36	206	2171
	Acreage irrigated - rice	0	30087	2028	14409	7042	400	8696	62662
	Acreage irrigated - general	13254	27579	5423	27832	5884	1542	11579	93093
1937	Seasonal diversion acre-feet	114609	402048	42570	247130	72526	12949	98629	1070461
	Average cubic feet per second	236	992	88	508	149	27	203	2203
	Acreage irrigated - rice	0	34214	2040	19235	3739	0	7318	66546
	Acreage irrigated - general	13324	30634	5843	29888	6710	2631	11806	100836
1938	Seasonal diversion acre-feet	120301	351901	31684	267085	66219	12447	82593	932230
	Average cubic feet per second	248	723	65	550	136	26	170	1918
	Acreage irrigated - rice	0	29522	1790	19616	4264	0	7396	62588
	Acreage irrigated - general	9309	27193	5137	27788	6476	1757	7935	85595
1939	Seasonal diversion acre-feet	141403	587358	29668	292226	89153	21496	139744	1301048
	Average cubic feet per second	291	1209	61	601	183	44	288	2677
	Acreage irrigated - rice	0	32917	750	17360	3667	0	9159	63853
	Acreage irrigated - general	13423	50185	6802	51711	13120	2727	12800	150768

TABLE 59 (CONTINUED)

SACRAMENTO RIVER - SEASONAL DIVERSIONS AND ACREAGES IRRIGATED 1924 - 1941
(SEGREGATED TO RIVER SECTIONS)

Year		River Sections							
		Redding to Red Bluff	Red Bluff to Butte City	Butte City to Colusa	Colusa to Wilkins Slu	Wilkins Slu to Knights Ldg	Knights Ldg to Verona	Verona to Sacramento	Redding to Sacramento
1940	Seasonal diversion acre-feet	116052	479028	15683	249532	70974	34057	97304	1062630
	Average cubic feet per second	239	986	32	513	146	70	200	2187
	Acreage irrigated - rice	0	31754	463	19475	4024	1541	7134	64391
	Acreage irrigated - general	9696	43885	6354	41548	7318	1318	9611	119752
1941	Seasonal diversion acre-feet	135305	493667	16903	305187	95969	25970	77114	1150115
	Average cubic feet per second	278	1016	35	628	197	53	159	2367
	Acreage irrigated - rice	0	40183	530	30716	6786	1013	5968	85196
	Acreage irrigated - general	12205	45217	6772	37039	7923	980	8445	118501
	Average 1924 - 1941								
	Seasonal diversion acre-feet	123309	463570	52896	238264	73335	19741	95054	1066168
	Average cubic feet per second	254	954	109	490	151	41	196	2194
	Percent of seasonal draft	11.6	43.5	5.0	22.3	6.9	1.8	8.9	
	Acreage irrigated - rice	0	32126	4054	15799	4274	732	6486	63469
	Acreage irrigated - general	14791	31423	7123	32200	7244	1630	11079	105492

TABLE 60

SUMMARY OF SACRAMENTO RIVER DIVERSIONS, DIVERSION PERCENTAGES AND ACREAGES IRRIGATED - 1941

River Section	Acre-feet diverted and monthly use in per cent of seasonal									Per Cent of Total Draft	Acreage Irrigated		Acre-feet per Acre
	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Total Draft		General	Rice	
Redding to Red Bluff (Ac. Ft.)	51	52	21179	23141	24585	24040	22763	19494	135305	11.8	12205	0	11.1
Per cent of seasonal	--	--	15.7	17.1	18.2	17.8	16.8	14.4					
Red Bluff to Butte City	0	4	53889	103518	112618	111622	80229	31787	493667	42.9	45217	40183	5.8
Per cent of seasonal	--	--	10.9	21.0	22.8	22.6	16.3	6.4					
Butte City to Colusa	0	15	1437	2626	5681	5798	1092	254	16903	1.5	6772	530	2.3
Per cent of seasonal	--	0.1	8.5	15.5	33.6	34.3	6.5	1.5					
Colusa to Wilkins Slough	0	2691	53276	61701	75353	69223	42573	370	305187	26.5	37039	30716	4.5
Per cent of seasonal	--	0.9	17.4	20.2	24.7	22.7	14.0	0.1					
Wilkins Slough to Knights Ldg.	0	398	15312	17026	22987	24947	15030	269	95969	8.3	7923	6786	6.5
Per cent of seasonal	--	0.4	15.9	17.7	24.0	26.0	15.7	0.3					
Knights Landing to Verona	0	0	3326	5689	6314	5835	4507	299	25970	2.3	980	1013	(1)13.0
Per cent of seasonal	--	--	12.8	21.9	24.3	22.5	17.4	1.1					
Verona to Sacramento	1832	2114	9148	14686	17691	18092	10995	2556	77114	6.7	8445	5968	5.4
Per cent of seasonal	2.3	2.7	11.8	19.1	23.0	23.5	14.3	3.3					
Total	1883	5274	157567	228387	265229	259557	177189	55029	1150115		118581	85196	5.6
Average cubic feet per second	31	89	2563	3838	4314	4221	2978	895	2367				
Monthly diversion in per cent of seasonal	.1	.5	13.7	19.9	23.0	22.6	15.4	4.8					

(1) The principal diversion on this section of river is the Portugese Bend plant of Sutter Mutual Water Co. Area irrigated is included in section between Colusa and Wilkins Slough.

TABLE 61

DIVERSIONS, ACREAGE IRRIGATED, AND GROSS SEASONAL (MARCH TO OCTOBER, INCLUSIVE) DUTY OF WATER IN THE SACRAMENTO-SAN JOAQUIN AREA - 1941

Source	Table Number	Seasonal Diversions: Acre-feet	Acreage Irrigated			Gross Seasonal Duty of Water Acre-feet per acre
			General	Rice	Total	
Sacramento River - Redding to Sacramento	62	1150115	118581	85196	203777	5.6
Feather River below Oroville	67	475240	27658	26640	54298	8.8
Yuba River on Valley floor	68	73530	7472	1345	8817	8.3
American River below Fairoaks	69	5309	(1) 3046	0	(1) 3046	(1) 1.7
By-Pass and Drainage Channels	66	41112	9370	3333	12703	(2) 3.1
Lower Butte Creek and Slough	65	27020	2171	0	2171	(3) 2.8
Colusa Trough and Back Borrow Pit	63 & 64	49841	4130	3249	(5) 7379	(4) 6.7
Total above Sacramento		1822167	(1)172428	119763	(1)292191	(6) 6.2
Delta Uplands from:						
Old San Joaquin River	70	50867	28842	0	28842	1.8
Tom Paine Slough	71	9562	3963	0	3963	2.4
San Joaquin River (below Durham Ferry Bridge)	72	40084	19298	0	19298	2.1
San Joaquin River from Fremont Bridge to Durham Ferry Bridge	73	93417	39866	484	40350	2.3
Merced River below Snelling	74	7588	3570	0	3570	2.1
Tuolumne River below Roberts Ferry Bridge	75	3147	1295	0	1295	2.4
Stanislaus River below Orange Blosson Bridge	76	16660	6940	110	7050	2.4
Total delta uplands & pumping diversions of San Joaquin River and Tributaries*		221325	103774	594	104368	2.1
Sacramento-San Joaquin Delta**		(See Table 124)				

* Note that major gravity diversions by canals of Oakdale, South San Joaquin, Modesto, Turlock Waterford and Merced Irrigation Districts and Miller and Lux are not included within the scope of these measurements

** Delta crop census not taken in 1941. See 1938 and reports prior to 1933 for detailed data.

(1) Includes 2200 acres classed as suburban lands but not shown in totals for Table 69.

(2) Duty figured after taking into account 300 acres of gun clubs not shown in totals. Diversions after November 1 not included.

(3) Duty figured after taking into account 7450 acres of gun clubs not shown in totals. Diversions after November 1 not included.

(4) Duty figured after taking into account 30 acres of gun clubs now shown in totals. Diversions after November 1 not included.

(5) A large portion of this diversion was used to supply acreages reported under Sacramento River Diversions (Provident Irrigation District). See footnote Table 62, Provident Irrigation District diversions at Mile 154.8R.

(6) See footnotes 2, 3 and 4.

TABLE 61A

RICE ACREAGE IN CALIFORNIA

A comparison of rice acreage served from stream channels in Sacramento-San Joaquin Valleys with rice acreages in California from all sources.

Year	Rice Acreage		Rice acreage in Sacramento-San Joaquin Valley in percent of total rice acreage
	Served from all sources*	Served from stream channels in Sacramento-San Joaquin Valleys**	
1924	90000	89000	99
25	103000	95000	92
26	149000	129000	87
27	160000	123000	77
28	132000	101000	76
29	95000	74000	78
30	110000	88000	80
31	125000	126000	100
32	110000	91000	83
33	108000	87000	80
34	108000	92000	85
35	100000	78000	78
36	138000	104000	75
37	132000	109000	82
38	125000	95000	76
39	120000	104000	87
40	118000	94000	80
41	153000	120000	78
Average 1924-1941	121000	100000	83

* As reported by Federal-State crop reporting service.
** From reports of Sacramento-San Joaquin Water Supervision.

TABLE 62

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--"M" STREET BRIDGE - SACRAMENTO -	MILE 0.0--												
City of Sacramento	0.8L	1-18"	1832	1869	2464	3323	3938	3552	2978	2303	22259	Municipal	
		3-20"											
--AMERICAN RIVER - MILE 1.1 LEFT--													
--BANK BORROW PIT RECLAMATION DISTRICT 1000 - MILE 1.3 LEFT --													
E. Fourness	1.45R	1-8"					81	61	7		149	142	
M. Zubiri	2.05L	1-8"			NO DIVERSION								
--RECLAMATION DISTRICT 1000 DRAIN - MILE 2.1L--													
Elmer F. Christophel	2.4L	1-5"			5	14	13	15	11		58	38	
H. M. Swalley	2.45L	1-5"				11	16	8	3		38	45	
N. J. Parr	2.9L	1-6"				9	13	11	7	2	42	25	
Earl Fruit Co.	3.55R	1-16"				262	64				326	161	
W. E. M. Beardslee Estate	3.75R	1-5"			6	15	26	44	43	3	137	54	
M. C. C. Van Loben Sels	4.0R	1-10"				14	47	30			91	90	
Reese & Greer	4.65R	1-7"				25	68	28	11	3	135	78	
Harbinson Bros.	5.05R	1-14"						36			36	20	
R. S. Seydel	5.25R	1-8"			9	16	52	72	27	8	184	172	
C. H. Merkley Estate	5.3R	1-8"				19	44				63	50	
Lucy Casselman	5.5R	1-6"				10	13	37			60	18	
A. A. Casselman	5.55R	1-6"				8	14				22	40	
K. L. Lovdal	5.7R	1-10"			NO DIVERSION								
J. E. Bandy	6.0R	1-6"					23	36			59	79	
Riverside Mutual Water Company	6.1L	2-18"				789	858	1486	411	110	3654	1415(1)	
O. A. and F. L. White	6.6R	1-6"			NO DIVERSION								
E. S. Fisk	7.0R	1-4"			NO DIVERSION								
Fred C. Jones	7.5L	1-8"				13	18	26	19		76	100	
Calif. Western States Life Ins. Co.	7.8L	1-10"				5	10	31			46	69	
A. Marty	7.9R	1-8"				5	61	32	12	3	113	75	
Bennett Bros.	7.9L	1-10"					34	25	17		76	39(2)	
M. Marty	8.3R	1-8"(3)											
		1-10"				4	121	129	68	25	347	208	
Blauth Estate	8.5R	1-7"				74	68	19			161	83	
H. Waldeck	8.7R	1-6"			12	14	21	20	9	3	79	41	
Hazel Goethe	8.95R	1-6"			NO DIVERSION								
Capital Company (4)	9.35R	1-14"				31	178	193	161		563	324	

*Mileage along river above Sacramento

(1) An additional 516 acres irrigated from interior drains.

(2) All on adjoining property of E. D. Willey.

(3) Formerly listed as 10" unit.

(4) Formerly California Lands Inc.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Total Diversion: March to October: Acre-feet	Acreage Irrigated: General	Acreage Irrigated: Rice
R. G. Pearson and P. S. Driver	9.8L	1-14"					169	336	49		554	(1)334	
Carl Casselman	9.9R	1-12"				5	75	70			150	110	
Lloyd M. Robbins	10.25L	1-14"				87	224	154	114		579	305	
Reese Estate	10.75R	1-12"					45	109			154	225	
Fiddyment (Lauppe) and Natomas Co. (Rosa)	10.75L	1-12"											
McKeehan & Harris	11.1R	1-12"				2	19	47	25		93	(2)45	
A. L. White	11.6L	1-10"				NO DIVERSION							
--ELKHORN FERRY - MILE 11.9--								61			61	40	
Conaway Ranch	12.0R	4-36"			503	1995	2162	2225	735		(3)7620	(4)765	2100
Thomas O'Connor	12.5R	1-5"											
		1-12"						4			4	30	
Gertrude Brown	12.7R	1-6"				13	27	14	3		57	30	
Julius Hauser	13.1R	1-12"				63	68	54			185	100	
J. Corey	13.2R	1-8"						9	3		12	(5)79	
M. Narahara	13.25R	1-8"				26	39	56	30	21	172	45	
Elkhorn Mutual Water Co.	14.1L	1-20"											
		1-24"				1137	1345	1861	783		5126	(6)1426	
Joseph Veress	14.25R	1-10"				17	48	32	4		101	135	
M. E. Dole	14.4R	1-6"				NO DIVERSION							
Capital Company (7)	15.15R	1-10"					47	49	34		130	72	
California Trust & Savings Bank	15.7L	1-6"				(8)NO DIVERSION					(8)	(8) 60	
Central Mutual Water Company	16.0L	1-20"											
		2-28"		245	3661	3793	4455	4152	3233		19539	940	(10)2173

* Mileage along river above Sacramento

(1) Divided as follows: Pearson 128, Driver 206.

(2) All on Natomas Company land.

(3) Includes 345 ac. for gun club & 120 ac. general crops on Swanston land in Sec. 3, T 8 N, R 3 E.

(4) Additional water received from Willow Creek and from spring runoff in By-pass.

(5) Only partially irrigated.

(6) An additional 516 acres irrigated from interior drains.

(7) Formerly California Lands Inc..

(8) See plant at Mile 16.0L

(9) This plant pumps to the irrigation canal both from a drain canal of R.D. 1000 and from the Sacramento River. The diversions listed are those from the river only. The water obtained from the drain canal was as follows: (Acre-feet) May 492, June 342, July 393, August 465, Sept. 422. Total 2114.

(10) Rice figures include 442 ac. in Eastside Sub. An additional 60 ac. general crop served for plant at Mile 15.7L.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Fisher & Rich (Hershey Plant)	16.27R	1-20"			122	563	508	496	493	34	(1)2216	28	(2)320
H. T. Silvius	16.4R	1-6"				(3)NO DIVERSION					(3)		(3) 60
California Trust & Savings Bank	16.62R	1-10"				(3)NO DIVERSION					(3)		(3) 95
California Trust & Savings Bank	16.7R	1-12"				(3)NO DIVERSION					(3)		(3) 95
Fisher and Rich	17.4R	1-18"			151	303	291	443	418	41	1647	90	(4) 25
Calif. Western States Life Ins.Co.	17.75R	1-20"				(5)NO DIVERSION					(5)		(5)
M. & J. Scheiber (Ashwandan)	18.45L	1-12"					41	43	15		99	80	
G. H. Lyall	18.7L	1-8"				NO DIVERSION							
Northern Mutual Water Company (6)	19.6L(6)	2-24"			2215	2021	2347	1986	1272		9841		960
Natomas Bon May Plant (7)	19.6L(7)	1-10"				NO DIVERSION							
--VERONA GAGING STATION - MILE 19.6--													
SACRAMENTO TO VERONA Totals			1832	2114	9148	14686	17691	18092	10995	2556	77114	8445	5968
Average cubic feet per second			30	36	149	247	288	294	185	42	159		
Monthly use in per cent of seasonal			2.3	2.7	11.8	19.1	23.0	23.5	14.3	3.3			
--FEATHER RIVER - MILE 20.9L--													
--SACRAMENTO SLOUGH - MILE 21.2L													
West Coast Life Insurance Co.	21.7R	1-15"				NO DIVERSION							
Frank Fisher & Henry Rich (Keller Plant)	22.5R	1-22"			769	1550	1508	1361	1250	81	6519		(8)450
A. F. Johnston	26.8L	1-8"						30			30	80	
Frank B. Edson	28.2L	1-4"				NO DIVERSION							
Morse Inglin	28.2R	1-6"				18	29	18	12	6	83	30	
Russell Bros.	29.2R	1-12"				21	50	50	15	1	137	96	
M. R. Richardson	29.7R	1-8"				NO DIVERSION							
P. L. Tranganza & Kate Russell	29.75R	1-8"							20		20	64	

*Mileage along river above Sacramento.

(1) A portion of this diversion used for 200 ac. rice. Also served by plant at Mile 22.5R

(2) Includes 120 ac. an adjoining Hershey Estate lands.

(3) See plant at Mile 17.4 and 22.5R.

(4) Additional acreages served as follows: Silvius Mile 16.4R - 20, Calif. Trust & Saving Bank Mile 16.62R - 45, Calif. Trust & Saving Bank Mile 16.7R - 45, Calif. Western States Life Mile 17.75R - 140.

(5) See plant at Mile 17.4R.

(6) Cross Canal, the main drain between R.D. 1000 and 1001, joins the Sacramento River at Mile 19.6 Left. Plant is on the south bank and 2.0 miles from junction with Sacramento River.

(7) Cross Canal - North Bank - 3.35 miles from junction with Sacramento River.

(8) Additional acreages served as follows: Hershey Estate (adjoining) 200, Silvius Mile 16.4R - 40, Calif. Trust & Savings Bank Mile 16.62 and 16.7R - 50 acres each.

TABLE 62 (CONTINUED

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Sabastine Ytwurraldi (1)	29.9L	1-12"					33	32			65	48	
Leo Giovanetti	30.2L	1-5"				NO DIVERSION							
M. R. Richardson	30.6R	1-12"					78	104	89		271	114	
Floyd Anderson	30.7R	1-6"				1					1	5	
George Senf	30.9L	1-8"				NO DIVERSION							
A. C. Huston	31.5R	1-12"					46	119	62		227	108	
M. Alonso	31.8L	1-6"				NO DIVERSION							
M. R. Richardson	32.0R	1-12"					34	77	63	20	194	55	
Sutter Mutual Water Co.(Portuguese Bend)	32.0L	2-24"			2461	3527	3880	3432	2603	138	16041	(2)	
Collier Bros.	32.5R	1-10"				27	50	62	34	6	179	110	
Walter H. Ziegler	33.2L	2-10"			96	536	448	408	359	47	1894	75	223
J. G. Knox	33.35L	1-8"				(3) NO DIVERSION					(3)	(3)	
Snowball Estate	33.5R	1-12"					91	98			189	60	
Leiser Bros.	33.75L	1-12"				9	45	32			86	(4)80	
J. W. Snowball	33.85R	1-6"					22	12			34	15	
--KNIGHTS LANDING GAGING STATION - MILE 34.0--													
VERONA TO KNIGHTS LANDING													
Totals					3326	5689	6314	5835	4507	299	25970	980	1013
Average cubic feet per second					54	96	103	95	76	5	53		
Monthly use in per cent of seasonal					12.8	21.9	24.3	22.5	17.4	1.1			
--COLUSA BASIN DRAINAGE - MILE 34.15--													
Meek Estate	34.2R	1-10"				(5) NO DIVERSION					(5)		(5)
		2-16"											
River Farms Co. (Townsite Plant)(6)	34.25R	1-20"				(6) NO DIVERSION						(6)	
		1-24											
		1-26											
Commercial Investment Company	34.85L	1-12"					97		34		131	106	
Walter Raymond	35.2L	1-12"				NO DIVERSION							
Walter Raymond	35.62L	1-7"				31	54	92	35		212	170	
J.H.Donnelly Ranch (Bundock Bros.)	35.8L	1-10"				21	40	10	11	3	85	(7) 79	

* Mileage along river above Sacramento.

(1) Formerly Laura Freitas.

(2) See plant at Mile 63.75L.

(3) See plant at Mile 33.75L

(4) An additional 40 ac. served for plant at Mile 33.35L.

(5) See plant on Knights Landing Ridge Cut 0.8R (By Pass and Drainage Channel diversions).

(6) Land usually served by this plant now gets water through plant on Back Borrow Pit Mile 0.03L.

(7) Includes 15 ac. on adjoining Gofitzer land.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
F. T. Burrell (J. L. Sills)	36.2L	(1) 1-14"			100	376	281	109			866	60	(2)150
R. H. Bailey (J. L. Sills)	36.45L	1-8"				4	31	14			49	45	
Amadeo Moroni (Leiser Bros.)	36.7L	1-5"				NO DIVERSION							
Robert Bottimore	37.2L	1-14"				NO DIVERSION							
Bundock Bros.	37.75L	1-8"				30	59				89	93	
Addie Reel	38.4L	1-10"					105	19	39		163	85	
Capital Company (H.A.Kramer) (3)	38.8L	1-10"						72			72	80	
F. O. Eastman	39.4L	1-12"							49		49	75	
Commercial Investment Company	39.8L	1-10"				NO DIVERSION							
William Duffy Jr.	39.9L	1-6"				NO DIVERSION							
Sutter Mutual Water Co. (State Bend Ranch)	40.6L	2-24" 1-36"		270	4215	4333	5013	5035	3599	18	22483	(4)	
Buell Ranch (M. K. Dean)	41.8L	1-4"				NO DIVERSION							
Buell Ranch (M. K. Dean)	42.2L	1-6"				NO DIVERSION							
Matteolli & Fratchia	42.3L	1-8"					45	32			77	50	
A. Kramer Estate	43.1L	1-12"					118	61	4	5	188	(5)250	
El Dorado Ranch	43.1R	1-18"				192	121	69	300	121	803	613	
River Farms Co.(R.D.#2047 Plant)	43.1R	2-50"		128	6469	4746	8481	8839	4625		33288	(6)1394	(6)4533
--RECLAMATION DISTRICT 108 DRAINAGE PLANT - MILE 44.0R--													
John Clauss	44.2L	1-14"				140		85	8		233	282	
John Clauss (Fuschlin)	47.3L	1-14"				125	119	104			348	175	
P. J. Hiatt	48.7L	2-20"			1170	2227	2420	2427	1562		9806	545	225
G. J. Glenn (7)	49.7L	1-14"				60	63	32			155	75	
R. D. #108 (Tyndall Mound Plant)	51.1R	2-24" 1-36"			1549	1653	2144	4076	2439		11861	(8)794	(8)1083
Holmes & Noble (P. J. Hiatt)	51.2L	2-16"			922	1751	1483	1636	1245		7037	(9)443	235
J. F. White	51.5L	1-8"				NO DIVERSION							
T. J. Cummins Ranch Co.	52.0L	1-16"				52	246	85	12		395	190	
George Van Ruiten	52.9L	1-10"					154	31			185	(10)315	

* Mileage along river above Sacramento.

(1) 12" unit removed.

(2) Rice crop not matured account water grass.

(3) Formerly California Lands Inc.

(4) See plant at Mile 63.75L.

(5) Includes 150 ac. on adjoining lands of E. S. Brown.

(6) Includes 2793 ac. rice and 44 ac. general in Recl. Dist #108. See also acreage note plant at Mile 51.1R for additional River Farms acreage.

(7) Formerly P. J. Hiatt.

(8) All on lands of River Farms Company.

(9) Includes 110 ac. on adjoining A. C. Middleton lands

(10) This is the total acreage served by this plant and the one at Mile 53.9L.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
George Van Ruiten	53.9L	1-12"					296	54	100		450	(1)	
Broomieside Farm	55.1L	1-20"				92	60	34	35		221	113	
R. D. $108 (Boyer Bend Plant)	56.4R	1-18"					170	156	94	90	510	425	
		1-30"											
C. M. Miller	56.42R	1-6"					8	2			10	13	
C. M. Miller	56.65R	1-12"				NO DIVERSION							
Broomieside Farm	56.95L	1-20"				153	10	65	4		232	160	
L. M. Miller	57.0R	1-10"						25	25	25	75	50	
Lamb Bros.	57.5L	1-16"				55	53	120			228	120	
James A. Neilson	58.2L	1-15"					103	88	72		263	(2)214	
Alex Grant	58.9L	1-16"				NO DIVERSION							
I. G. Zumwalt (3)	59.1R	1-12"						52	82		134	251	
Lamb Bros.	59.8L	1-8"			887	975	1068	1394	606		4930	(4)470	(4)560
		1-12"											
		1-14"											
R.D. #108 (Steiner Bend Plant)	59.85R	1-16"				NO DIVERSION							
F. L. Burrell	60.4L	1-10"				NO DIVERSION							
Blanche Coulter Brown	60.5L	1-12"				NO DIVERSION							
Sutter Basin Corp. (Coles Ldg.)	61.3L	1-12"				NO DIVERSION							
I. G. Zumwalt (3)	61.5R	1-12"					81	63	23		167	68	
Hines Ranch	62.3R	1-10"					21	26	10		57	58	
Blanche Coulter Brown	62.3L	1-10"				NO DIVERSION							
Jake Locovitch	62.6R	1-8"				NO DIVERSION							
R. L. Young	62.8L	1-8"				10	43	40	17	7	117	62	
--WILKINS SLOUGH GAGING STATION - MILE 62.9--													
KNIGHTS LANDING TO WILKINS SLOUGH													
Totals			0	398	15312	17026	22987	24947	15030	269	95969	7923	6786
Average cubic feet per second			0	7	249	286	374	406	253	4	197		
Monthly use in per cent of seasonal			0	0.4	15.9	17.7	24.0	26.0	15.7	0.3			

*Mileage along river above Sacramento

(1) See plant at Mile 52.9L

(2) Includes 107 acres on adjoining Saylor property.

(3) New installation 1941

(4) All the rice and 420 acres general crops on adjoining lands of R. D. 1500.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversion in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
R.D. #108 (Wilkins Slough Plant)	63.2R	5-42"		296	16300	14616	17075	16436	5676		70399	(1) 1078	(1) 10158
B. W. Meister	63.65L	(2) 1-8 "				55	26	11			92	85	
Sutter Mut. Water Co. (Tisdale Plant)	63.75L	6-42"		2133	31831	37661	43879	39901	30600	75	186080	(3) 22121	(3) 16882
		2-48"											
Ornbaum, Nobles, Land & Livestock Co.	64.3R	1-12"											
Tisdale Irrigation & Drainage Co.	64.4L	1-12"						48	14		62	20	
Van Horn Ranch	64.9R	1-14"			134	303	427	436	216	1	1517	(4) 1344	(4) 49
M. Bettencourt	65.1R	1-8 "				44	103	44	44		235	325	
Capital Company (6)	65.7L	1-10"				(5) NO DIVERSION:					(5)	(5) 10	
M. P. Sohohr	65.8R	1-16"					165	165			330	100	
J. L. Browning	66.4R	1-18"					29	15	11		55	(7) 60	
Tisdale Irrigation & Drainage Co.	67.1L	1-12"				321	427	286	43		1077	560	
		1-20"				241	893	929	35		2098	(8)	(8)
Desmond A. Winship	67.2L	1-10"											
Scott F. Ennis & E. S. Brown	67.5L	2-24"				(8) NO DIVERSION:					(8)	(8) 172	
--RECLAMATION DISTRICT #70 DRAIN - MILE 68.80L--				75	713	1374	1384	1543	934		6023	(9) 1768	180
Meridian Farms Water Co. #5 (10)	68.80L	1-24"											
J. L. Browning	69.0R	1-24"				(11) NO DIVERSION:					(11)	(11)	(11)
Faxon Ranch	69.2R	1-18"				NO DIVERSION:							
--EDDYS FERRY (GRIMES) - MILE 69.45--						111	522	306			939	908	
Wilber Jensen & Mary Cecil, et.al.	70.35R	1-24"				NO DIVERSION:							
H. F. Daly	70.4L	1-10"					11	10			21	31	
Houchins, Hoffman, Beckley & Ritchie	70.4R	1-6 "		80	928	677	625	616	377		3303	(12) 101	(12) 440
		1-20"											
Meridian Farms Water Co. #4	71.1L	1-24"			31	357	926	1252	565		3131	875	

* Mileage along river above Sacramento.

(1) See plant at Mile 43.1 (River Farms Co.) for additional R. D. #108 acreage.

(2) Replaces 12" unit.

(3) This is the total acreage served by this plant and the ones at Mile 32.0L & 40.6L and includes lands served in R. D. 1660 as follows: General 1718, Rice 804; Water delivered (acre-feet) May 1630, June 1930, July 3600, August 3300, Sept. 2600. Total 13060.

(4) This is the total acreage served by this plant and the one at Mile 67.1L. An additional 172 ac. served for plant at Mile 67.2L.

(5) See plant at Mile 65.8R.

(6) Formerly California Lands Inc.

(7) An additional 10 acres served for plant at Mile 65.1R.

(8) See plant at Mile 64.4L.

(9) Includes following adjoining acreages; Sutter Butte Canal Co. 51 and L. C. Middleton 82.

(10) Combination irrigation and drainage plant.

(11) No diversion from river. All pumping from R.D. #70 drain canal which enters river at this point. Acreage served, 257 rice and 687 general. An additional 51 acres served through plant at Mile 67.5L. Diversion from canal as follows: (Acre-feet) May 741, June 583, July 1301, August 712. Total 3337.

(12) Divided as follows: Houchins 56 rice 18 general, Hoffman 351 rice 43 general, Ritchie 34 general

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversion in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct		General	Rice
J. L. Browning	71.9R	1-12"				78	74	222	21		395	(1)173	
Antone Steidlmayer	71.9R	1-12"				(2) NO DIVERSION					(2)	(2)90	
Calif. Western States Life Ins. Co.	72.3L	1-7"					31	16			47	90	
E. B. Vann	73.6R	1-10"				NO DIVERSION							
Meridian Farms Water Co. #3	74.8L	1-18"				204	577	304	29		1114	559	
L. B. Westfall	75.3R	1-10"				49	79	49	9		186	(3)163	
J. H. Yates	76.1L	1-12"						41			41	65	
Joe Miller (Sanborn)	76.2L	1-8"					10	16			26	(4) 45	
Steidlmyer Bros.	76.5R	1-16"				141	89	70			300	190	
E. V. Jacobs	77.9L	1-12"				NO DIVERSION							
Sebia Davis Est.	78.2R	1-16"				NO DIVERSION							
Sebia Davis Est.	78.8R	(5)1-14"			1391	2787	2373	2107	1388		10046	1542	1908
		1-24"											
C. E. Reische	79.0L	1-10"				20	106	29			155	(6)145	
Steidlmayer Bros.	79.0R	1-12"				NO DIVERSION							
Henry Schmidt	79.3R	1-10"						28			28	32	
E. V. Jacobs	79.5L	1-8"				NO DIVERSION							
G. W. Wood	79.7L	1-10"					31				31	30	
--MERIDIAN BRIDGE -- MILE 79.85--													
Meridian Farms Water Co. #1 & 2	80.0L	1-20"		107	1913	1820	4062	3402	2204		13508	1960	1099
		1-24"											
Roger C. Wilbur	80.3R	1-8"					36				36	45	
Wonderly & Lillienthal	81.5L	1-16"				57	51	74			182	(7)103	
Steidlmayer Bros.	81.9R	1-20"				234	231	255	165	123	1008	(8)795	
F. T. Reische & L. F. Wood	82.5L	1-12"				3	32				35	(9) 64	
J. T. Pinkard	83.05L	1-7"				NO DIVERSION							
Geo. W. Kirkpatrick Estate	83.3L	1-14"				NO DIVERSION							
J. E. Clark	83.5L	1-8"				NO DIVERSION							
--BUTTE SLOUGH OUTFALL GATES - MILE 84.0L													

*Mileage along river above Sacramento.

(1) Additional 90 acres served for Steidlmayer at Mile 71.9R.
(2) See Browning at Mile 71.9R.
(3) Includes 110 acres on adjoining Tuttle - Brown property.
(4) Includes 30 acres on adjoining lands of M. S. Davis.
(5) Unit added in 1941.
(6) Included adjoining acreages as follows: Rockholt 19, Kilgore 30, Lemos 28, Staas 24.
(7) Divided as follows: Wonderly 33, Lillienthal (Rowley) 70.
(8) Includes 300 acres on adjoining lands of A. H. Tubbs.
(9) Divided as follows: Reische 37, Wood 27.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Clifford Reichel	85.8L	1-8"				NO DIVERSION						
Ewing & Halsey	86.1R	1-12"					48				48	70
Lydell Peck	86.1L	1-8"				NO DIVERSION		(1)			(1)	(1) 35
Lydell Peck	86.6L	1-18"				NO DIVERSION						
Lloyd Seoggins	86.8L	1-8"					69	33			102	(2) 65
Capital Company (Wilbur) (3)	86.9R	1-10"			5	34	86	12	24	27	188	80
Capital Company (Wilbur) (3)	87.4R	1-10"					58				58	35
Jacobsen & O'Rourke	87.6L	1-10"				NO DIVERSION						
Swinford Tract Irrig. Co.	87.7R	1-12"				42	106				148	(4)136
Edward K. Lange	88.0R	1-6"					7				7	20
Nagle and Locovitch	88.2L	1-10"					38				38	(5) 35
W. D. De Jarnett Estate	88.7L	1-14"			30	183	276	199	191	122	1001	275
Colusa Irrigation Co.	89.2R	1-20"				289	391	368	27	22	1097	(6)640
Phil B. Arnold	89.25L	1-8"				NO DIVERSION						
G. A. Berkey	89.26L	1-12"				NO DIVERSION						
--COLUSA BRIDGE & GAGING STATION - MILE 89.4--												
WILKINS SLOUGH TO COLUSA												
Totals			0	2691	53276	61701	75353	69223	42573	370	305187	37039	30716
Average cubic feet per second			0	45	866	1037	1226	1126	715	6	628		
Monthly use in per cent of seasonal			0	0.9	17.4	20.2	24.7	22.7	14.0	0.1			
Lillian and Hattie Boggs	89.7L	1-6"				NO DIVERSION						
Roberts Ditch Company	90.7R	2-20"			72	432	676	468	224	81	1953	1233	
Paul R. Westfall	91.1L	1-6"						1	10		11	15	
I. G. Zumwalt	91.6R	1-12"				NO DIVERSION						
George P. Ahlf	92.5L	1-8"					32				32	(7)45	
Colusa County Bank	93.0L	1-8"				NO DIVERSION						
U. W. Brown	93.0R	1-12"				NO DIVERSION						
I. G. Zumwalt	93.2R					PLANT REMOVED						

* Mileage along river above Sacramento.

(1) See plant at Mile 86.8L.

(2) An additional 35 acres served for plant at Mile 86.1L.

(3) Formerly California Lands Inc.

(4) Divided as follows: A. F. Sutton 36, M. P. Montgomery 30, E. W. Tennant 27, R. Edmans 17, J. E. Montgomery 15 and J. Cairo 11.

(5) Divided as follows: Nagle 20, Locovitch 15.

(6) Includes 80 acres on adjoining J. Zwald property.

(7) All on adjoining lands of Colusa Development Company.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Paul R. Westfall	93.4L	1-10"								44	44	63	
Tuttle Land Company	94.3R	1-15"		16		56	324				396	(1)175	
		1-20"											
W. D. De Jarnett Estate	94.6R	1-8"				(2) NO DIVERSION					(2)	(2) 20	
Capital Company (3)	94.8R	1-12"				NO DIVERSION							
A. N. Lewis	95.6L	1-16"					351	1005			1356	600	
		1-20"											
Bridget Graham Estate	95.8L	1-16"					223	391			614	1000	
I. G. Zumwalt	96.8R	1-15"					21	82			103	150	
H. Heitman	97.7R	1-12"				6	56		16	4	82	50	
Frank N. Beckley	98.0L	1-10"					7				7	10	
J. L. Erisey	98.3R	1-10"				NO DIVERSION							
R. A. Sperry & Colusa Development Co.	98.6L	1-15"					5				5	20	
D. Boggs	98.8L	1-18"					114	51			165	160	
Cheney Slough Irrigation Co.	99.0R	2-26"				NO DIVERSION							
		1-36"											
J. P. Boggs	99.1L	1-10"				20	150	79	57		306	135	
Terrill & Sartain	99.2L	1-20"			906	1001	1257	1250	687		5101	(4)160	530
Dave George (Bond & Cauzza)	99.8L	1-16"					24				24	30	
R. C. Wohlfrom (Gillenwater)	101.1R	1-20"				6	142	150			298	138	
Clara C. Packer	102.8R	2-18"					363	301	88		752	913	
		2-30"											
		1-36"											
Charles W. Welch	103.7R	1-16"			126	175	294	236		104	935	637	
Compton-Dolevan Irrigation Dist.	103.8R	2-24"				(5) NO DIVERSION					(5)	(5)	(5)
		1-36"											
C. W. Tuttle	103.9R	1-16"				40	136	70	10	21	277	130	
		1-20"											
Colusa Development Company	104.8L					PLANT ABANDONED							
I. G. Zumwalt	104.8L	1-12"				NO DIVERSION							
Thousand Acre Ranch (H. W. Keller)	106.0R	1-14"				7	242	33			282	225	
Capital Company (3)	110.0R	1-12"				89	99	47			235	195	
Capital Company (3)	111.2R	1-6"					15				15	27	

*Mileage along river above Sacramento.

(1) An additional 20 acres served for plant at Mile 94.6R.

(2) See plant at Mile 94.3R

(3) Formerly California Lands Inc.

(4) Includes 30 acres on adjoining Browning property.

(5) See plant at Mile 154.8R.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--PRINCETON FERRY - MILE 112.0--													
Reclamation Dist. #1004	112.1L	2-30"			333	778	1118	1634			3863	590	
		1-50"											
Princeton-Codora-Glenn I.D. (1)	112.4R	3-24"				(1) NO DIVERSION					(1)	(1)	(1)
I. G. Zumwalt	112.6L	1-10"					17				17	(2) 25	
Edward L. Steele Estate	115.5L	1-12"				16	14				30	26	
--BUTTE CITY GAGING STATION - MILE 115.8--													
COLUSA TO BUTTE CITY													
Totals			0	15	1437	2626	5681	5798	1092	254	16903	6772	530
Average cubic feet per second			0	0.3	23	44	92	94	18	4	35		
Monthly use in per cent of seasonal			0	0.1	8.5	15.5	33.6	34.3	6.5	1.5			
R. H. Gebicke	115.85L	1-14"				15	64	65			144	175	
--BUTTE CITY FERRY - MILE 115.9--(3)													
Butte City Ranch	115.9R	1-10"				NO DIVERSION							
Butte City Ranch	116.7R	1-10"				NO DIVERSION							
R. H. Gebicke (4)	116.9L	1-12"				95	27	104			226	100	
Capital Company (5)	117.8R	1-10"				NO DIVERSION							
C. T. White	123.7R	1-6"				NO DIVERSION							
S. Taylor	123.8R	1-3½"				NO DIVERSION							
Princeton-Codora-Glenn I. D. (6)	123.9R	3-24				(6) NO DIVERSION					(6)	(6)	(6)
Provident Irrig. Dist. (6)	124.2R	1-36"				(6) NO DIVERSION					(6)	(6)	(6)
		4-42"											
Capital Company (Shellce Rch.) (5) (6)	124.4R	1-16"				(6) NO DIVERSION					(6)	(6)	(6)
Capital Company (Leonard Rch.) (5) (6)	126.3R	1-12"				(6) NO DIVERSION					(6)	(6)	(6)
F. S. Reager	130.75R	1-6"				NO DIVERSION							
--ORD FERRY - MILE 130.8--													
M.& T. Inc. & Parrott Invest. Co.	141.5L	5-24"			701	56		1676	1287		(7) 3720	(8) 3525	(8) 1456

* Mileage along river above Sacramento.

(1) See plant at Mile 154.8R.

(2) An additional 125 acres served from lake.

(3) Bridge removed and replaced by ferry.

(4) New installation 1941.

(5) Formerly California Lands Inc.

(6) See plant at Mile 154.8R.

(7) Additional waters from Butte Creek as follows: (Acre-feet) May 5000, June 5000, July 5680, Aug. 3110, Sept. 2830. Total 21620.

(8) Divided as follows: M. & T., Rice 731, General 1028 (Source of water about equally divided between Butte Creek and Sacramento River). Parrott Investment Co., Rice 734, General 2497 (60% water from Sacramento River and 40% from Butte Creek).

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
OLD CHICO LANDING RAILROAD BRIDGE SITE - MILE 142.1--													
Alameda Putney	145.8L	1-6"				13	15	11	2		41	20	
Edward Fierro	146.5L	1-6"							11		11	10	
C. C. Dunning	148.9R	1-10"				28	27	31		26	112	70	
--GIANELLA BRIDGE - MILE 149.5--													
Capital Company (1)	150.0L	1-10"				61	68	41			170	75	
Joseph Gianella	(2)150.0L	1-10"				NO DIVERSION							
Holly Sugar Corporation	151.0R	1-12"			42	460	928	1002			2432	(3)954	
		1-16"											
A. Holecak	152.2R	1-6"			3	15	16	10	9	4	57	39	
Maas Bros.	154.6R	1-5"				4	9	6	5		24	12	
Glenn-Colusa Irrigation District	(4)154.8R	2-30"			37869	76577	85272	82920	59705	25324	(5)367667	(6)29120	(6)28650
		1-42"											
		2-50"											
		2-66"											
		4-72"											
		1-100"											
Jacinto Irrigation District	154.8R	(7)			1349	3302	3759	3788	3074	1855	17127	6538	
Compton-Delevan Irrig. Dist.	154.8R	(7)			1279	1849	1845	1845	664		7482	1146	1093
Provident Irrigation District	154.8R	(7)			6349	9496	7897	7649	6742	1224	(8)39357	655	(9)6812
Princeton-Codora-Glenn I. D.	154.8R	(7)			5950	10617	11470	11453	7718	1780	48988	2228	2163
Maxwell Irrigation District	154.8R	(7)			254	492	492	492	739	1451	3920	(10)1200	
Capital Company (Shelloe Rch.) (1)	154.8R	(7)					147	244	36		427	364	
Capital Company (Leonard Rch.) (1)	154.8R	(7)				85	129	147	159	60	580	131	
Jonathon Garst	161.7L	2-16"				170	227		1	4	402	220	

* Mileage along river above Sacramento.

(1) Formerly California Lands Inc.

(2) Pump on Nord Slu or Pine Creek Lagoon which joins Sacramento River at Mile 147.0L. Plant is located 3 miles up slu on right bank or opposite Mile 150.0L, Sacramento River.

(3) Includes 100 acres on adjoining Billiou property.

(4) This is common point of diversion for Glenn-Colusa, Jacinto, Compton-Delevan, Provident, Princeton-Codora-Glenn, Maxwell I.D. and Capital Company.

(5) Additional water from Stony Creek as follows: (Acre-feet) April 5455, May 29256, June 2420. Figure includes diversions for users outside of District as follows: (Acre-feet) Mills Orchards (formerly Golden State Orchards) 625, I. G. Zumwalt 6738. Zumwalt water used on acreage on Colusa Trough Mile 2.2L.

(6) An undetermined acreage served for Mills Orchard and I. G. Zumwalt (see Note 5).

(7) Same plant as that of Glenn Colusa Irrigation District.

(8) District operates plants on Colusa Trough (see Table 63) to supplement diversions from river.

(9) Includes 385 acres outside of district.

(10) Includes 500 acres for gun clubs, diversion for which started in September.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSION - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--CORNING-VINA BRIDGE - MILE 166.5--													
A. F. Landis	166.7R	1-3"			1	4	5	4	7	3	24	13	
Mrs. Guy Whitnack	166.8R	1-2"				1	1	2	1		5	4	
--TEHAMA BRIDGE - MILE 177.5--													
E. B. Noble	184.5R	1-14"		4	86	56	116	80	32	55	429	60	
Coneland Water Company	187.6L	1-12"				NO DIVERSION							
Wallace Bosworth	188.6L	1-8"				10	8	13			31	37	
--RED BLUFF BRIDGE - 193.45--													
G. E. Sutton	196.2R	1-3"				NO DIVERSION							
J. Keithdriber	196.5L	(1) 1-2½"						2	1		3	1	
		1-4"											
S. and E. Erickson	196.6L	1-5"				20	22	15	11	1	69	30	
C. Droz	197.0L	1-8"			6	92	74	22	25		219	54	
W. H. Freemeyer	197.65L	1-3"				NO DIVERSION							
--RED BLUFF GAGING STATION (IRON CANYON) - MILE 198.6--													
BUTTE CITY TO RED BLUFF													
Totals			0	4	53889	103518	112618	111622	80229	31787	493667	45217	40183
Average cubic feet per second			0	.07	876	1740	1832	1815	1348	517	1016		
Monthly use in per cent of seasonal			0		10.9	21.0	22.8	22.6	16.3	6.4			
C. C. Budd	206.75L	1-10"				NO DIVERSION							
--BEND FERRY BRIDGE - MILE 207--													
Mrs. A. A. Keene	209.0L	1-2½"				NO DIVERSION							
J. F. Nunes	213.0R	1-7"					40	17	5		62	20	
F. L. Jelly	213.5L	1-3"				NO DIVERSION							
--JELLYS FERRY - MILE 215.6--													
J. F. Nunes	216.0R	1-3"				NO DIVERSION							
W. A. Hunaeus	216.4L	1-3"				NO DIVERSION							
T. A. Haakonson	217.5L	1-3½				11	39	15	2		67	54	
J. L. Haskins	218.0L	1-5"					33				33	33	
Rio Alto Rancho	221.0R	1-10"				NO DIVERSION							
--BALLS FERRY BRIDGE - MILE 224.5--													
--ANDERSON BRIDGE - MILE 232.9--													
L. C. Smith	233.0L	1-6"				NO DIVERSION							
Menzel Estate	240.2L	1-12"				113	512	232	94	60	1011	135	

* Mileage along river above Sacramento.

(1) This unit was installed in 1938.

TABLE 62 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Anderson-Cottonwood Irrig. Dist.	240.5L	1-24"			1163	2101	2336	2589	1885	985	11059	1633	
Jack Graf	241.5L	1-8"				NO DIVERSION							
--REDDING - ALTURAS BRIDGE - MILE 242.0--													
--REDDING - YREKA BRIDGE - MILE 245.9:													
Columbia Construction Company	245.4L	1-16"				(1) NO DIVERSION					(1)	(1)	
		1-18"											
Anderson-Cottonwood Irrig. Dist.	246.0R	Gravity			19953	20832	21408	20959	20576	18297	(2)122025	10313	
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 246.25--													
John Diestelhorst	246.3R	1-10"					35	17	21	4	77	17	
--OLD REDDING - YREKA BRIDGE - MILE 246.4--													
City of Redding	246.7R	2-6"	51	52	63	84	182	211	180	148	971	Municipal	
RED BLUFF TO REDDING													
Totals			51	52	21179	23141	24585	24040	22763	19494	135305	12205	-
Average cubic feet per second			0.8	0.9	344	389	400	391	383	317	278		
Monthly use in per cent of seasonal			-	-	15.7	17.1	18.2	17.8	16.8	14.4			
TOTAL DIVERSIONS - SACRAMENTO TO REDDING													
Totals			1883	5274	157567	228387	265229	259557	177189	55029	1150115	118581	85196
Average cubic feet per second			31	89	2563	3838	4314	4221	2978	895	2367		
Monthly use in per cent of seasonal			.1	.5	13.7	19.9	23.0	22.6	15.4	4.8			

*Mileage along river above Sacramento.

(1) Diversion for gravel washing only.

(2) Considerable return water from this diversion reaches the Sacramento River as seepage or direct spill in drains and creek channels between Redding and south of Cottonwood.

TABLE 63

*COLUSA TROUGH DIVERSIONS - 1941

Water User	**Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
--COLUSA TROUGH GAGING STATION - MILE 0.--														
I. G. Zumwalt	2.2L	1-15"				29	377	319	209		(1) 1434	240	950	
		1-20"												
		1-36"												
A.D.J.Land Company (Kindred)	3.0L	1-12"			58	301	218	170	150	145	15	1057		140
Wiersma Bros. (2)	4.5L	1-12"				20	242	390	400	343		1395		190
Maxwell Irrig.Dist.Plant 2A	7.0R	1-15"				NO DIVERSION		(3)				(3)	(3)	(3)
		1-26"												
		1-36												
Maxwell Irrig.Dist.Plant 3A	7.0R(4)	1-20"				NO DIVERSION		(3)				(3)	(3)	(3)
S. Ashe	7.65R	1-10"				NO DIVERSION								
S. Ashe	8.0L	1-20"				NO DIVERSION								
El Dorado Sportsman Club	9.5R	1-15"							152	243	395			30
M. A. Rourke	10.5L	1-20"				NO DIVERSION								
Provident Irrig.Dist.(Delevan Pump)	Opp.13.5 (5)	1-20"				174	1074	1313	1356	1041	(6) 4958	(6)	(6)	
--LATERAL HIGHWAY - BUTTE CITY TO WEST SIDE - MILE 20.5.--														
Provident I.D.(Willow Cr.Plant)	Opp.20.5(7)	1-24"				870	997	1431	1933	1247	127 (6) 6605	(6)	(6)	
		1-36"												
Henry Jameson Estate	22.0R	1-18"				NO DIVERSION								
Provident I.D. (Drain #55)	Opp.24.2(8)	Gravity				1353	1794	1853	1853	1794	1853 (6) 11000	(6)	(6)	
Provident I.D. (Drain #13)	Opp.27.0(9)	1-15"				105	815	962	946	623	(6) 3451	(6)	(6)	
Total Acre-feet			0	58	3323	5169	6496	7457	5554	2238	30295	240	1280	30
Average cubic feet per second			0	1	54	87	106	121	93	36	62			
Monthly use in per cent of seasonal			0	.2	11.0	17.1	21.4	24.6	18.3	7.4				

*Main drain of Reclamation District 2047

**Mileage along Colusa Trough above Colusa-Williams Highway.

(1) Additional water from Glenn Colusa Irrigation District, Sacramento River Mile 154.8R.

(2) New installation 1941.

(3) See Maxwell Irrigation District diversion at Mile 154.8R on Sacramento River.

(4) Plant is on Lateral E (Stone Corral Creek) and is 3/4 mile west of Plant #2A (Mile 7.0R).

(5) Plant is on Hunter Creek at SW Corner Section 36, T. 18 N, R 3 W.

(6) See Provident Irrigation District diversion at Mile 154.8R on Sacramento River.

(7) Plant is on Willow Creek at SW Corner NE¼, Section 33, T 19 N, R 2 W.

(8) Works are on Drain #55 and are in SW¼ NW¼, Section 86, Glenn Ranch survey.

(9) Works on Drain #13 and are in SW¼ SW¼, Section 51, Glenn Ranch survey.

TABLE 64

*BACK BORROW PIT DIVERSIONS - 1941

Water User	**Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 0.2--													
--KNIGHTS LANDING RIDGE CUT JUNCTION - MILE 0.4R--													
River Farms Company (1)	0.03L	1-16"			158	273	1489	500	254		2674	1065	
River Farms Company	1.45R	1-16"			154	483	582	625	566		2410		500
E. L. Wallace & W. Crawford	4.35R	1-16"											
		1-20"			NO DIVERSION								
Reclamation District 108	8.8R	1-14"			NO DIVERSION								
Hershey Estate (Johnson and Peterson)	11.15R	1-12"											
		1-14"			NO DIVERSION								
Hershey Estate	13.75R	1-16"			NO DIVERSION								
Reclamation District 108 (2)	13.76L	1-16"			NO DIVERSION								
C. M. Mumma	14.75R	1-10"			57	135	123	131	73		519	45	84
--COUNTY LINE BRIDGE - MILE 15.25--													
M. T. Emmert	15.75R	1-15"			NO DIVERSION								
Katherine West	18.1R	2-15"			NO DIVERSION								
C. R. Suggett (3)	20.0R	1-15"			125	819	677	552	447		2620		435
Gregory Estate (G.W.Knox,Jr.)	21.35R	1-16"			NO DIVERSION								
Bean & Brandenberg	22.15R	1-14"			189	633	657	647	486		2612		310
J. W. Browning Co.	22.65L	1-24"			NO DIVERSION								
--HANHUM BRIDGE - MILE 22.8--													
SOUTHERN PACIFIC RAILROAD CROSSING - MILE 23.0													
H. Dalsdon	24.6L	1-20"					611	701	430		1742	1460	
A. M. Dobrowsky	24.7L	1-8"					21	70	60	15	166	120	
--GRIMES-COLLEGE CITY CAUSEWAY - SOUTH LINE OF RECLAMATION DISTRICT 2047) - MILE 25.5													
Fred Schutz (Chas.Tuttle)	26.4L	1-16"					626	236	165		1027	1200	
		1-20"											
Wallace Ranch (Fred Wilkins)(2)	28.0R	2-12"			100	713	670	603	275		2361		240
A. Davis Estate	29.1R				PLANT REMOVED								
--WALLACE CROSSING - MILE 29.2 (OLD MERIDIAN-WILLIAMS BRIDGE)--													
J. C. Hornall (2)	33.5R	1-20"			308	840	868	868	531		3415		400
W. H. O'Hair	36.65	1-20"			NO DIVERSION								
--COLUSA WILLIAMS HIGHWAY - MILE 37.0--													
--COLUSA TROUGH GAGING STATION AT "COLUSA-WILLIAMS HIGHWAY"--													
Totals			0	0	1091	3096	6324	4933	3207	15	19546	3890	1969
Average cubic feet per second			0	0	18	65	103	80	55	0.2	40		
Monthly use in per cent of seasonal			0	0	5.6	19.9	32.4	25.2	16.8	0.1			

*Carries return water from Colusa Basin along West Border of Reclamation Districts 108 and 787 and thence to discharge to Sacramento River at Knights Landing or partial diversion via Knights Landing Ridge Cut.

**Mileage along Borrow Pit from outfall gate just above junction of Borrow Pit with Sacramento River at Knights Landing.

(1) This plant serves some of the land formerly served by Sacramento River plant (Mile 34.25R).

(2) New installation 1941.

(3) Formerly listed as C. R. Suggett and Gregory Estate.

TABLE 65

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October: acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club**
Lower Butte Creek														
--SACRAMENTO RIVER JUNCTION - MILE 0--														
Reclamation District 833	1.5L	1-8"			NO DIVERSION									
Reclamation District 833	2.9L	1-36"box					654:	702:			1356:	600:		
West Butte Farms Co.	3.85L	1-8"						37:			37:	150:		
Reclamation District 1004 (1)	3.9R	1-15"			No DIVERSION						(1)	(1):	(1):	(1)
		1-24"												
Butte Lodge Outing Club	4.0R	1-22"												
El Anzar Duck Club	5.35L	1-12"			NO DIVERSION						(2)			(2)900:
Reclamation District 1004	9.3R	Gravity						5:			5:	4:		
Butte Basin Gun Clubs (4)	10. (4)	Gravity				241:	1417:	1684:	3045:	2588:	8975:	744:		(3)1550:
White-Mallard Duck Club	10.2R	1-36"box							6080:	9300:	(4) 15380:			5000:
Murdock Land Co.	14.4R	1-12"			NO DIVERSION									
--GRIDLEY ROAD - MILE 15.4--					92:	138:	92:				322:	150:		
Murdock Land Co.	19.3	1-14"												
--BIGGS - AFTON ROAD MILE 19.4--					67:	65:	127:	85:	76:	46:	466:	115:		
Glenn Rice Farms	20.4R	1-24"												
--RICHVALE - BUTTE CITY ROAD - MILE 22.5--					NO DIVERSION									
O. W. Baker & Sons, Inc.	23.0R				PLANT DISMANTLED									

*Approximate mileage from junction with Sacramento River.

**Only diversions which occurred prior to November 1st are given for gun club acreage. In most instances diversions for this purpose extended into November and December.

(1) Reclamation District 1004 diversion points are: Sacramento River 112.1 Left and Butte Creek Mile 3.9 Right and 9.3 Right.

(2) See diversion at Mile 9.3R.

(3) An additional 900 acres served for plant at Mile 4.0R.

(4) In addition to gun clubs under other diversions listed, this comprises the group of clubs diverting Butte Creek water by gravity from the main or interconnecting channels (Sanborn Slough, etc.) in the vicinity of Mile 10. Through R. D. 833 canals, most of the clubs in this group receive also drainage and Feather River water diverted for the clubs by Western Canal. These diversions are principally in the fall months. For diversions via Western Canal see table of Feather River Diversions, Mile 59.7R. The area flooded by this group is estimated to be approximately 5000 acres. The clubs included are Wild Goose, Last Chance, Berry and Keller, Tule Goose, Bettens, Greenhead, Field and Tule, North Butte, Henshaw, Sacramento Outing, Anderson, West Butte, and Colusa Shooting.

TABLE 65 (CONTINUED)

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to: October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	**Gun Club
Butte Slough														
Butte Slough Irrigation Co.,Ltd. (Diversion to Sutter By-Pass)(1)	0.9 West	Gravity									(1)	(2)		
M. Marty	0.3 West	1-12"				13	42	31	19		105	69		
G. S. & D. C. Smith	1.4 East	1-8"					38	57			95	120		
--MAWSON BRIDGE - MILE 2.1--														
J. E. Smith	3.0 West	1-10"					10	26			36	(3)78		
I.E. Nall	3.5 West	1-10"				23	32	42	24		121	43		
P. A. Reische	4.1 West	1-10"					26	13			39	(4)38		
E. V. Jacobs	4.8 West	1-10"			NO DIVERSION									
Armstrong, Henson, Locovitch	5.1 West	1-12"					22	36		25	83	(5) 60		
W. Nall	6.3 West	1-7"			NO DIVERSION									
T. J. Hageman	6.8 West	(6)3-8"			NO DIVERSION									
--OLD LONG BRIDGE - MILE 7.5 WEST--														
Totals (Lower Butte Creek and Butte Slough)			0	0	159	480	2460	2710	9244	11959	27020	2171		7450
Average cubic feet per second			0	0	3	8	40	44	155	194	56			
Monthly return in per cent of seasonal			0	0	0.6	1.8	9.1	10.1	34.2	44.2				

*Approximate mileage from junction with Sacramento River.

**Only diversions which occurred prior to November 1st are given for gun club acreage. In most instances diversions for this purpose extended into November and December.

(1) Butte Slough Irrigation Company maintains a dam on Butte Slough just above its junction with Sacramento River and thereby diverts water via Butte Slough to East and West Borrow Pits of Sutter By-Pass near "Long Bridge". The total water so diverted is shown in Table 90. Rediversions from West Borrow Pit of Sutter By-Pass are made. See Sutter By-Pass Diversions, Table 66.

(2) See acreages under rediversions - West Borrow Pit Sutter By-Pass. A considerable additional but indefinite acreage was served by sub-irrigation and direct diversions from flow diverted to East Borrow Pit of Sutter By-Pass which is joined by Feather River return flow entering via Wadsworth Canal, Table 93. See East Borrow Pit Sutter By-Pass Diversions, Table 66.

(3) Includes 55 acres on adjoining Miller and Straub lands.

(4) Includes 6 acres on former Ullrey lands and 10 acres for C. P. Reische.

(5) All on P. D. Hensen lands.

(6) 5" Unit removed.

TABLE 66

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS - 1941

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
West Borrow Pit of Sutter By-Pass														
	(1)													
--WEST BORROW PIT GAGING STATION - MILE 0.4														
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 2.5														
C. Fred Holmes	7.1*	1-10"	NO DIVERSION											
--KNIGHTS LANDING - MARYSVILLE CAUSEWAY - MILE 12.7--														
--SOUTH LEVEE TISDALE BY-PASS - MILE 16.9--														
--RECLAMATION DISTRICT 1660 GRAVITY RETURN - MILE 19.3--														
Sutter Basin Improvement Co.:														
(C. Giusti) (2)	24.4R	1-24"		250	1550	1500	1550	1480	1100		7430		842	
State Reclamation Board Tr.#29	26.3*		PLANT REMOVED											
State Reclamation Board Tr.#27	26.8*		PLANT REMOVED											
D. C.Smith, E.I.McGrath and S. A. McKeehan	27.1		PLANT REMOVED											
Butte Slough Irrig.Co.Ltd.(3)	28.4	Gravity	887		1631	2278	1660				6456	4660		
Fred & George Tarke	28.6	2-10"	NO DIVERSION											
Frye Bros.	29.0	1-7"	NO DIVERSION											
--NEW COLUSA - MARYSVILLE HIGHWAY - MILE 29.1--														
--NORTHERN ELECTRIC RAILROAD CROSSING - MILE 29.15--														
East Borrow Pit of Sutter By-Pass														
	(4)													
R. E. Hughes	0.4S*	1-14"					76	308	40		424	400		
R. E. Hughes	0.1S*	1-16"	NO DIVERSION											
--GAGING STATION "WILLOW SLOUGH AT CHANDLER" - MILE 0--														
R. E. Hughes	0.5N*	1-16"					186				186	250		
--RECLAMATION BOARD DRAINAGE PLANT #1 - MILE 1.4N--														
Earl Lane (2)	(5)1.4N(0.4)	1-16"			82	255	338	311	222		1208		(6)	
Earl Lane (2)	(5)1.4N(1.3)	1-10"			125	247	342	263	208		1185		(7)500	
E. H. Christensen (2)	(5)1.4N(2.0)	1-15"				328	641	423	368		1760		(8)300	
E. H. Christensen	(5)1.4N(2.7)(9)	1-12"			47						47		(10)	

(1) Mileage is given northerly from drainage plant of Reclamation District 1500. Mile 9.15 West Borrow Pit is opposite Chandler. Asterisk indicates area irrigated is within By-Pass area.
(2) New installation 1941.
(3) See Butte Slough Diversion, Table 65; also Table 90.
(4) Mileage is given northerly or southerly from Chandler. Chandler is opposite Mile 9.15 West Borrow Pit. Asterisk indicates area irrigated is within By-Pass area.
(5) Plant is on drain canal which enters By-Pass at this point. Figure in () indicates distance along drain from By-Pass.
(6) See plant 1.4N (1.3)
(7) This is the total acreage served by this plant and the one at 1.4N (0.4)
(8) This is the total acreage served by this plant and the one at Mile 1.4N (2.7)
(9) Unit used at 1.4N (2.7) and 1.4N (3.29) during 1941.
(10) See plant at Mile 1.4N (2.0).

TABLE 66 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS - 1941

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversions March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
East Borrow Pit of Sutter By-Pass (Continued)														
	(1)													
E. H. Christenson (2)	(4)1.4N (3.29)	(3) 1-12"						160	122		282	(5)		
A. J. Kimerer	(4)1.4N (3.3)	1-14"			NO DIVERSION									
E. H. Christenson	(4)1.4N (3.3)	1-16"			516	885	890	641	633	68	3633	(6)380	(6)	
Nelson Bros.	(4)1.4N (3.3)	1-12"			NO DIVERSION (7)						(7)		(7)200	
R. E. Hughes	1.5N*	1-14"					130	59	35		224	340		
Arnold Christenson	2.2N				PLANT REMOVED									
State Reclamation Board	2.3N*				PLANT REMOVED									
State Reclamation Board	2.65N*				PLANT REMOVED									
R. E. Hughes	2.9N*	1-14"						252			252	280		
R. E. Hughes	3.85N*	1-14"			NO DIVERSION									
R. E. Hughes	4.0N**	1-14"					291	175			466	411		
—KNIGHTS LANDING - MARYSVILLE CAUSEWAY - MILE 4.4N—														
R. E. Hughes	4.5N*	1-14"			NO DIVERSION									
Ira Mulligan (2)	5.7N	1-16"			18	610	695	649	563		2535		300	
R. E. Hughes (2)	6.0N*	box 1-20"					180	120			300	300		
State Reclamation Board	6.6N*				PLANT REMOVED									
Ira Mulligan (2)	7.1N	1-16"				342	628	589	441	34	2034		300	
—RECLAMATION BOARD DRAINAGE PLANT #2 - MILE 10.0N—														
Spurgeon Gun Club	10.0N*	1-6"							1111	356	1467			300
		1-12"												
—EAST LEVEE OF WADSWORTH CANAL - MILE 16.0N—														
—RECLAMATION BOARD DRAINAGE PLANT #3 - MILE 16.5N—														
State Reclamation Board Tr.#33	17.0N*				PLANT REMOVED									
State Reclamation Board Tr.#31	17.8N*				PLANT REMOVED									
State Recl.Board Trs.#26 & 30	18.5N*				PLANT REMOVED									

(1) Mileage is given northerly or southerly from Chandler. Chandler is opposite Mile 9.15 West Borrow Pit. Asterisk indicates area irrigated is within By-Pass area.
(2) New installation 1941.
(3) Unit used at 1.4N (2.7) and 1.4N (3.29) during 1941.
(4) Plant is on drain canal which enters By-Pass at this point. Figure ( ) indicates distance along drain from By-Pass.
(5) See Plant at Mile 1.4N (3.3)
(6) This is the total acreage served by this plant and the one at Mile 1.4N (3.29). An additional 200 acres rice served for Nelson Bros. plant at Mile 1.4N (3.3).
(7) See Christensen plant at Mile 1.4N (3.3).

TABLE 66 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS - 1941

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion: March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
East Borrow Pit of Sutter By-Pass (Continued)														
	(1)													
R. H. Morehead	18.75N				PLANT REMOVED									
Meyer, Platter, Moorhead, Dewitt Bros., Epperson & Middleton	19.1N	1-8" 1-14"				233	617	517			1367	(2)506		
State Reclamation Board	19.2N*				PLANT REMOVED									
State Reclamation Board	19.97*				PLANT REMOVED									
--NEW COLUSA-MARYSVILLE HIGHWAY - MILE 19.98N--														
--NORTHERN ELECTRIC RAILROAD CROSSING MILE 20.0N--														
Sacramento Slough														
	(3)													
C. Fred Holmes	1.4R	1-24"			NO DIVERSION									
Knights Landing Ridge Cut (4)														
Hook Est. (Wallace S. Crawford (6)	0.8R	1-20"			1017	1622	1393	1357	590		5979		803	
	(5)													
--RECLAMATION DISTRICT 730 DRAIN PLANT #2 - MILE 3.8--														
Ralph W. Pollock	4.55L	1-12"			NO DIVERSION									
Hershey Estate (Darnielle)	4.7L	1-15"					118	210	18		346	214		
Sieber Bros.	4.7R	1-6"			10	10	10	3	3		34	10		
Hershey Estate (6)	4.9R	1-16"						82			82	85		
--WEST LEVEE YOLO BY-PASS - MILE 6.3--														
Frank Fisher, Henry Rich and E.L. Wallace	6.3(7)	Gravity			NO DIVERSION									

(1) Mileage is given northerly or southerly from Chandler. Chandler is opposite Mile 9.15 West Borrow Pit. Asterisk indicates area irrigated is within By-Pass area.
(2) Divided as follows: Meyer 90, DeWitt & Meyer 146, Epperson 168, Middleton 102.
(3) Mileage is given easterly from drainage plant of Reclamation District 1500 which is at head of slough.
(4) Flow is principally Colusa Basin drainage diverted to the Ridge Cut by checking at the Knights Landing outfall gates on the Back Borrow Pit of Reclamation District 787. See Table 105
(5) Mileage is given southerly from head in Back Borrow Pit near Knights Landing.
(6) New installation 1941.
(7) See Yolo By-Pass diversions Mile 10.0N and 10.1N.

TABLE 66 (CONTINUED)

DY-PASS AND DRAINAGE CHANNEL DIVERSIONS - 1941

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
Yolo By-Pass (East Borrow Pit or Tule Canal) (1)														
	(2)													
Robert Swanston	1.8S	1-10"				NO DIVERSION								
Robert Swanston	1.1S	1-10"					119	81			200	(3)		
Robert Swanston	0.7S	1-14"					352	240			592	(4)400		
State of California	0.02S					PLANT REMOVED								
--NORTH LEVEE SACRAMENTO BY-PASS - MILE 0.0--														
Robert Swanston	1.8N*	1-20"				NO DIVERSION								
California Packing Corporation	2.4N	1-20"					415	67	525		1007	(5)806		
California Packing Corporation	3.4N	1-8"					15		30		45	(6)		
Smith & Roberts	5.9N	1-14"				270	313	340	400		1331	40	80	
--SACRAMENTO-WOODLAND HIGHWAY - MILE 6.1S--														
--SACRAMENTO-WOODLAND RAILROAD CROSSING - MILE 6.2--														
Julius Hauser	7.0N*	1-14"				NO DIVERSION								
RECLAMATION DISTRICT 1600 DRAINAGE PLANT - MILE 10.0--														
Frank Fisher and Henry Rich	(7)10.0N	1-10"				NO DIVERSION								
Frank Fisher and Henry Rich	10.1N*	Gravity				NO DIVERSION								
E. L. Wallace(Hershey Lands)	10.1N*	Gravity						240			240	200		
--FREMONT WEIR (EAST END) - MILE 12.3--														

(1) Diversions from East Borrow Pit of Yolo By-Pass are primarily from water diverted through Knights Landing Ridge Cut (Table 105).
(2) Mileage is given northerly or southerly from north levee of Sacramento By-Pass. Asterisk indicates land irrigated is in By-Pass area.
(3) See plant at 0.7S.
(4) This is the total acreage served by this plant and the one at Mile 1.1S.
(5) This is the total acreage served by this plant and the one at Mile 3.4N.
(6) See plant at Mile 2.4N.
(7) Area usually served is within District 1600 and water is backed up through drainage plant.

TABLE 66 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS - 1941

Water User	Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated		
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice	Gun Club
Back Borrow Pit Reclamation District 1000														
NO DIVERSION														
Totals - By-Pass and Drainage Channel Diversions														
West Borrow Pit of Sutter By-Pass		0	250	2437	3131	3828	3140	1100	0		13886	4660	842	0
East Borrow Pit of Sutter By-Pass		0	0	788	2900	4028	4653	3743	458		17370	2867	1600	300
Sacramento Slough		0	0	0	0	0	0	0	0		0	0	0	0
Knights Landing Ridge Cut		0	0	1027	1640	1514	1652	608	0		6441	317	803	0
Yolo By-Pass (East Borrow Pit or Tule Canal)		0	0	0	278	1214	968	955	0		3415	1526	88	0
Back Borrow Pit Reclamation District 1000		0	0	0	0	0	0	0	0		0	0	0	0
Totals		0	250	4252	7949	11304	10413	6406	458		41112	9370	3333	300
Average cubic feet per second		0	4	69	134	185	169	108	7		85			
Monthly use in per cent of seasonal		0	0.6	10.4	19.3	27.7	25.3	15.6	1.1					

TABLE 67

FEATHER RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion: March to October Acre-feet	Acreage Irrigated: General	Acreage Irrigated: Rice
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.			
Sutter Basin Corporation	0.6R		PLANT REMOVED									
Henry Rutz	1.55L	-1-8"				44	25	9		78	64	
Sutter Basin Corporation	2.60R	1-20"	NO DIVERSION									
		1-26"										
Capitol Co. (1) (2)	6.44L	1-10"					115	108		223	140	
M. Scheiber	7.7L	1-10"				40	173	131	143	63	550	(3)206	
---NICOLAUS GAGING STATION - MILE 9.3												
---NICOLAUS BRIDGE - MILE 9.4												
Bercut Richards Co.	9.75R	1-20"					279	385	95	240	999	(4)618	
Garden Highway Mutual Water Co.	13.1R	1-20"			1022	2493	2915	2719	2400	154	11703	909	865
		1-24"										
Feather River Water Co.	16.35R	1-14"				11	135	106	4		256	285	
Plumas Mutual Water Co.	17.5L	1-22"			347	2020	1659	1669	1435	290	7420	1012	300
G. C. Shannon	18.75R	1-6"				36	89	23	60		208	62	
Oswald Water District	21.4R	1-16"			200	660	893	692	494		(5)2939	(6)618	
Alicia Mutual Water Co.	24.0L	1-20"				405	298				703	256	
Nevada-California Lands, Inc.(7)	25.2R	1-10"				56	88	1			(5) 145	50	
Levee District #1	26.8R	Gravity	NO DIVERSION									
---MOUTH OF YUBA RIVER - MILE 27.3R												
---YUBA CITY -- MARYSVILLE BRIDGE - MILE 28.0												
J. L. Sullivan, Jr.	33.9R	1-10"				128	107	72	8		315	160	
Sutter Butte Canal Co.(Sunset Plant)	38.1R	1-26"				1000	1194				(8)2274	(8)	(8)
		2-42"											
J.L.Sullivan,Jr.and C.J.Mathew	(9) 42.7L	1-10"				278	250	300	130		958	355	
	(0.4L)												
Thomas Mathew	(9) 43.7L		NO DIVERSION									
	(0.7)												

*Mileage along river above mouth.

(1) Formerly California Lands, Inc.
(2) Plant reinstalled 1941.
(3) Included 34 acres on adjoining Garwood lands.
(4) Included 18 acres on adjoining Albright lands.
(5) Additional water received from wells.
(6) Includes 145 acres on adjoining lands.
(7) Formerly Cunningham Bros.
(8) See diversion at Mile 58.1R.
(9) Plant diverts Feather River water backed into Honcut Slough. Slough is tributary to Feather River at Mile 43.7 Left. Mileage of plant above mouth of Honcut Slough is indicated ( ). All plants on left bank of slough.

TABLE 67 (CONTINUED)

FEATHER RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet:	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Moznett & Wetmore Sub. #1	(1)43.7L(1.2)	1-10"				162	103	106			371	188	
Manuel A. Barba (Borges)	(1)43.7L(1.25)	1-8"			21	35	51	7	9	6	129	80	
A. P. Barba	47.9L	1-12"				NO DIVERSION							
E. F. Biggs	48.3L	1-10"					148	115	7	5	275	240	
Edward Dunning	49.0L	1-8"				14	74	20			(2) 108	55	
Clyne Ranch (Penecaldo)	51.0R	1-6"				6	39	7			52	(3) 31	
C. E. Porter (Bettencourt)	51.1L	1-7"			20	48	46	26	30	18	188	62	
Edward Steadman	51.4R	1-10"					121	40			161	(4)120	
Capital Co. (5)	51.6R					PLANT REMOVED							
F. J. Fratus (6)	52.1L	1-10"				NO DIVERSION							
Capital Co. (5)	52.5L	1-6"					4	5			9	30	
F. L. Morris	52.7L	1-8"				30	41	14	9	23	117	71	
Frank Dutra	52.9R	1-6"				NO DIVERSION							
Ruby Chambers	53.1R	1-6"				15	23	11	11		60	38	
Budh Singh Banes	54.7R	1-8"			NO DIVERSION FROM RIVER								
Hearst Estate	55.1L	1-14"				279	330	46	49		740	301	
L. A. Kister Estate	55.5L					PLANT REMOVED							
Mrs. Alvin Kister	57.0L	1-8"				78	79	23	14		194	30	
Henry Hazelbusch	57.9R	1-9"				23	39			27	89	70	
Sutter Butte Canal Co.	(7)58.1R	Gravity		1640	44790	41030	56380	56650	47620	28324	(8)276434	19998	6729
Richvale Irrigation District	(7)58.1R	Gravity		600	16270	14900	20480	20580	17300	10290	(9)100420	876	10581
Western Canal Co.	59.7R	Gravity		208	7843	9144	17137	16552	8624	7650	(10)67158	733	8165
--OROVILLE BRIDGE - MILE 65													
--U.S.G.S.GAGING STATION - MILE 70													
Totals			0	2448	70513	72971	103334	100433	78451	47090	475240	27658	26640
Average cubic feet per second			0	41	1146	1225	1684	1635	1318	766	980		
Monthly use in per cent of seasonal			0	.5	14.8	15.4	21.7	21.2	16.5	9.9			

*Mileage above river above mouth.

(1) Plant diverts Feather River water backed into Honcut Slough. Slough is tributary to Feather River at Mile 43.7L. Mileage of plant above mouth of Honcut Slough is indicated in ().

(2) Additional water received from wells.

(3) An additional 15 acres served by plant at Mile 51.4R.

(4) Included 15 acres served through plant at Mile 51.0R.

(5) Formerly California Lands, Inc.

(6) Formerly Federal Land Bank.

(7) This is common point of diversion for Sutter Butte Canal Company and Richvale Irrigation District.

(8) An additional 4365 acre feet diverted in November.

(9) An additional 1585 acre feet diverted in November.

(10) Diversion for gun clubs in Butte Basin as follows (Acre-feet): Oct. 7600, Nov. 3439, Dec. 298. See Lower Butte Creek diversions (Table 65).

TABLE 68

YUBA RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of pump	Monthly Diversions in Acre-feet								Total Diversion: March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
-- GAGING STATION "YUBA RIVER AT MARYSVILLE" (SEVENTH STREET BRIDGE) - MILE 0.9--													
Davis Bros.	1.6L	1-12"				17	33	69			119	80	
Charles Shinkle (Harrington)	1.8R	1-5"					6	9	3		18	5	
Marysville River Farms Co.	3.0L	1-10"				130	118	170	72		490	250	
Yuba River Farms Company	3.4R					PLANT REMOVED							
E. O. Rubke	4.1L	1-8"				30	85	82	29		234	(1) 95	
Earl Fruit Co. and Dinsmore	4.75L	1-10"				227	55	32			314	136	
Dantoni Orchards Co.(Earl Fruit Co.)	5.3L	1-8"				77					77	50	
--DAGUERRE POINT DAM - MILE 11.0--													
Hallwood Irrigation Company	(2)11.0R	Gravity		2624	6981	8658	9074	9019	6974	5954	49284	(3)4128	530
Cordua Irrigation District	(2)11.0R	Gravity			3608	3929	4203	4038	3594	3622	(5)22994	(4)2728	815
Yuba Consolidated Gold Field Co.	14.5L	Gravity				NO AGRICULTURAL DIVERSION							
--SMARTVILLE GAGING STATION - MILE 20--													
Totals			0	2624	10589	13076	13574	13419	10672	9576	73530	7472	1345
Average cubic feet per second			0	44	173	220	221	218	180	156	151		
Monthly use in per cent of seasonal			0	3.6	14.4	17.8	18.4	18.3	14.5	13.0			

* Approximate mileage along river above highway crossing at Marysville.
(1) Includes 50 acres on adjoining Hendricks Lands.
(2) Hallwood Irrigation Company and Cordua Irrigation District have a common point of diversion and common canal for about one-half mile.
(3) Includes 65 acres served by Cordua Irrigation District.
(4) Includes 180 acres gun club out side district. An additional 65 acres served for Hallwood Irrigation District.
(5) A portion of the October diversion used on 660 acres of gun clubs on lands already cropped.

TABLE 69

AMERICAN RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--GARDEN HIGHWAY BRIDGE - MILE 0.2--													
--AUBURN BOULEVARD BRIDGE (16th STREET) - MILE 1.9--													
--SACRAMENTO - NORTHERN RAILROAD BRIDGE - MILE 2.0--													
--WESTERN PACIFIC RAILROAD BRIDGE - 2.1--													
North Sacramento Lands Company	2.4R	1-6"				NO DIVERSION							
North Sacramento Lands Company	2.55R	1-5"				NO DIVERSION							
North Sacramento Lands Company	2.65R	1-7"					7	8			15	8	
G. A. Meister	3.1L	1-10"				NO DIVERSION							
--SOUTHERN PACIFIC RAILROAD BRIDGE - MILE 3.5--													
G. A. Meister	3.7L	1-4"				NO DIVERSION							
		1-6"											
G. A. Meister	4.1L	1-10"				NO DIVERSION							
C. Swanston & Sons	4.2R	1-10"						45	25		70	(1)160	
C. Swanston & Sons	5.3R	1-10"					34	109			143	(2)	
C. Swanston & Sons	5.5R	1-6"						17	8		25	(2)	
W. S. Kendal Estate	5.7L	1-10"					56	79	25		160	110	
--GAGING STATION - "AMERICAN RIVER AT SACRAMENTO" - MILE 6.1--													
S. H. Cowell	7.1L	1-7"				NO DIVERSION							
E. Clemens Horst Company	7.5R	1-8"				33	86	4			123	104	
Haggin Hop Farm (John L. Haas)	7.8R	1-5"				12	42				54	44	
Hagginbottom Land Company	8.05R	1-10"				NO DIVERSION							
J. H. Kerby	9.0L	1-6"				52	48	28			128	43	
Hagginbottom Land Company	9.2R	1-12"				NO DIVERSION							
Collins Ranch	9.2L	1-8"				NO DIVERSION							
Mrs. C. E. Coleman	9.35L	1-5"				14	5	14			33	(3)50	
Mrs. C. E. Coleman	9.5L	1-5"				19	15	7			41	(4)50	

* Mileage along river above mouth.

(1) This is the total acreage served by this plant and the ones at Miles 5.3 and 5.5R.

(2) See plant at Mile 4.2R.

(3) See plant at Mile 9.5L.

(4) This is the total acreage served by this plant and the one at Mile 9.35L.

TABLE 69 (CONTINUED)

AMERICAN RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Mrs. C. E. Coleman	9.55L	1-5"					10	10	6	9	35	13	
Henry Cowell	9.6L	1-6"				NO DIVERSION							
R. A. Bartlow (1)	10.2R	1-5"				9	15				24	15	
Guy H. Roddan	10.3L	1-10"				NO DIVERSION							
Gold Nugget Orchard Company	10.4R	1-5"				2	49				51	17	
Hagginbottom Land Company	10.5R					PLANT REMOVED							
Mucke Sand and Gravel Company	11.2L	1-6"		3	5	8	9	7	7	4	43	20	
J. T. Gore Estate	11.5L	(2)1-8"				10	33	24	16	10	93	60	
William A. Meyer	11.7L	1-4"					13				13	27	
Capitol Building & Loan Co. (3)	11.7L	1-5"				7	20				27	32	
H. T. Danielson	13.1R	1-5"				6	5	2	5		18	8	
P. Osterli	13.2R	1-6"				15	70	24			109	46	
		(4)1-4"											
C. Deterding, Jr., J. R. Deterding and M. McDonald (5)	13.9R	1-6"					165	60	34		259	57	
C. Deterding, Jr., J. R. Deterding and M. McDonald (5)	14.7R.	1-4"				NO DIVERSION							
C. Deterding, Jr., J. R. Deterding and M. McDonald (5)	15.1R	1-6"					20				20	32	
Carmichael Irrigation District	16.0R	1-6"	150	250	374	649	829	764	547	262	(6)3825	(7)	
		2-12"											
William H. Devlin	17.1R	1-6"				NO DIVERSION							
--GAGING STATION - AMERICAN RIVER AT FAIROAKS - MILE 19.2--													
Totals			150	253	379	836	1531	1202	673	285	5309	(8)846	
Average cubic feet per second			2.4	4.2	6.2	14.0	25.0	20.0	11.0	4.6	11.0		
Monthly use in per cent of seasonal			2.8	4.8	7.1	15.7	28.8	22.7	12.7	5.4			

* Mileage along river above mouth
(1) Formerly Frank E. Krause.
(2) Replaces 6" unit.
(3) Formerly Harry Nakatomi.
(4) Unit added in 1941.
(5) Formerly Mary Deterding.
(6) Additional water received from wells.
(7) 2200 acres classed as suburban lands. No details of irrigation available.
(8) Note approximately 2200 acres classed as suburban lands are not included.

TABLE 70

DELTA UPLANDS DIVERSIONS FROM OLD SAN JOAQUIN RIVER - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
East Contra Costa Irrigation Dist.	(1)36.5L	1-24"			1084	4296	5123	3021	2256	545	(2) 16325	12204	
		2-18"											
		2-30"											
Byron Bethany Irrigation District	(3)40.9L	1-26"			950	2880	2840	2690	2220	1020	12600	5030	
		1-30"											
Federal Land Bank	(4)44.6L	1-7"				NO DIVERSION							
E. H. Stevenson Estate	45.3L	1-12"				NO DIVERSION							
H. Lindeman	47.2L	1-12"				112	5	91			208	170	
Gus Lindeman	47.2L	1-10"				NO DIVERSION							
West Side Irrigation District	(5)47.65L	7-15"		447	2649	2949	3537	3038	1695	777	(6)15092	(6)7784	
Vance Brown	48.7L	1-8"				6	7	5			18	15	
Naglee Burke Irrigation District	50.4L	1-16"			708	963	1191	910	909	517	5198	(7)2726	
		1-18"											
Freemont Irrigation Association	50.9L	1-14"			84	271	297	235	259	50	1196	(8)662	
Joe Freitas	51.0L	1-8"				11	11	11	7		40	35	
Attilio Casserini	51.2L	1-8"			11	6	8	8			33	40	
Excelsior Ranch #2	52.4L	1-10"			6	47	68		36		157	175	
--TOM PAINE SLOUGH - MILE 54.3--													
Totals			0	447	5492	11541	13087	10009	7382	2909	50867	28842	
Average cubic feet per second			0	7.5	89	194	213	163	124	47	105		
Monthly use in per cent of seasonal			0	.9	10.8	22.7	25.7	19.7	14.5	5.7			

*Distance along river from its mouth 4½ miles below Antioch. Mileage is established by War Department Survey of 1913-15.

(1) To junction of Old River and Indian Slough. Pumping plant is located two and one-half miles west along Indian Slough.
(2) An additional 3876 acre-feet obtained from wells and interior drains.
(3) To junction of Old River and Italian Slough. Pumping plant is located 2-3/4 miles southwest along Italian Slough and extension cut.
(4) Plant is on cut which joins river at Mile 44.6 left.
(5) To junction of Old River with Intake Cut. Pumping plant is located one mile south along Intake Cut.
(6) Includes 400 acres served for Tracy Clover I.D. (See Tom Paine Slough Mile 2.1S.) Estimated that 800 ac.ft.furnished to that district.
(7) Additional 7 acres served for plant at Mile 50.9L.
(8) Includes 7 acres served through plant at Mile 50.4L.

TABLE 71

DELTA UPLANDS DIVERSIONS FROM TOM PAINE SLOUGH - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	River
Stimson Estate Company	0.7S	2-18"			86	178	247	190	144	89	934	(1)828	
Stimson Estate Company	1.2S	1-18"			12	25	22	15	36		110	70	
Holly Sugar Corporation	(2)2.1S	1-10" Box			8	178	204	65	9		464	(3)303	
		1-12"											
Tracy Clover Irrigation District	(2)2.1S	1-16"				NO DIVERSION		(4)			(4)	(5)	
Pescadero R.D. #2058 Plant #1	2.9S	1-12"			105	131	117	103	77	15	548	(5)2762	
Pescadero R.D. #2058 Plant #3	6.3S	1-24"			932	1142	1268	1212	1258	344	6156	(6)	
Pescadero R.D. #2058 Plant #5	8.3S	1-12"			156	228	191	145	103	60	883	(6)	
Pescadero R.D. #2058 Plant #5A	9.0S	1-12"			107	90	114	58	77	21	467	(6)	
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 9.1S--													
--LINCOLN HIGHWAY - MILE 9.9S--													
Totals			0	0	1406	1972	2163	1788	1704	529	9562	3963	
Average cubic feet per second			0	0	23	33	35	29	29	9	20		
Monthly use in per cent of seasonal			0	0	14.7	20.6	22.7	18.7	17.8	5.5			

* Distance along Tom Paine Slough from its mouth which is at Mile 54.3 on Old San Joaquin River (War Department Survey of 1913-15).

(1) Includes 50 acres served by plant at Mile 2.1S and 291 acres on adjoining lands.

(2) To junction of Tom Paine Slough and dredger cut. Pumping plant is located 1½ miles south along dredger cut.

(3) An additional 50 acres served for plant at Mile 0.7S.

(4) Acreage served through West Side Irrigation District plant. Old San Joaquin Mile 47.65L.

(5) This is the total uplands area (South of Tom Paine Slough) irrigated from all Pescadero Reclamation District plants on Tom Paine Slough.

(6) See plant at Mile 2.9S.

TABLE 72

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
GARWOOD BRIDGE - MILE 45.3--													
Katten and Morengo Ranch	45.45R	1-8"				48	23	49	27	9	156	90	
A. Jury	45.5R	1-6"			6	11	9	6		6	38	25	
C. R. Van Buskirk	45.6R	1-5"	2		23	44	55	25	17	14	180	62	
		1-8"											
Mrs. John D. McDougall	46.3R	2-6"				NO DIVERSION							
Ivy Rainey	46.65R	1-6"				NO DIVERSION							
Wilhoit & Hammill	46.85R	1-10"				77	70	73			220	160	
L. F. Grimsley	47.2R	1-6"						45	9		54	30	
Wolfinger Bros.	47.3R	1-10"				NO DIVERSION							
Alma A. Haack	48.0R	1-12"			22	76	128	143	60	53	482	187	
H. G. Learned (Lee Young)	48.3R	1-4"			4	4	8	7	6	3	32	9	
H. G. Learned	48.5R	1-3½"		1	4	5	5	7	6	1	29	16	
Joe Calcagno	48.5R	1-6"			3	52	39	53	24	7	178	(1) 95	
F. Piccardo, J. Vigliani & J. Calcagno	48.55R	1-6"	2	6	11	13	18	19	9	11	89	(2) 47	
G. B. Figari	48.6R	1-5"				8	9	12	3		32	50	
M. O. Couper	49.0R	1-10" Box				NO DIVERSION							
Mettler, Cross & Drury (S.B. Chapman)	49.5R	1-14"			26	33	43	13	37	14	166	50	
A. A. Rodgers	50.1R	1-10"			29	22	16	49	16	13	145	45	
--BRANDT BRIDGE - MILE 50.2--													
Frank Reichmuth (N. Lagler)	50.4R	1-8"				NO DIVERSION							
B. & K. Watanabe (3)	50.6R	1-8"		9	6	15	24	19	14	10	97	40	
D. Toscano (4)	50.8R	1-6"			12	11	15	16	11	3	68	40	
J. J. O'Toole (4)	51.8R	1-12"				35	16	8	8	3	70	18	
Capital Company (5)	52.2R	1-12"					5	15	2		22	20	
A. Geraldi	52.5R	1-5"			1	1	2	5	3	2	14	18	
F. C. Roberts	52.65R	1-6"					1	5			6	11	
F. C. Roberts	52.8R	1-8"					40	32	22	9	103	58	
Capital Company (5)	53.2R	1-12"				11	2	29			42	100	
Wm. Nishimura (6)	53.4R	1-8"				9	20	15	4		48	30	
M. Dos Reis	53.7R	1-12"			70	75	130	158	31		464	435	

* Distance along San Joaquin River from its mouth four and one-half miles below Antioch. (Mileage as established by War Department Survey of 1913-15).

(1) Includes 15 acres served by plant at Mile 48.55R.
(2) See plant at Mile 48.5R.
(3) Formerly Emil Brandt.
(4) Formerly C. E. Brandt
(5) Formerly California Lands Inc.
(6) Formerly Arthur Green.

TABLE 72 (CONTINUED)

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
R. E. Albertson	54.9R	1-10"				5	100	129			234	75	
--JUNCTION WITH MIDDLE RIVER - MILE 56.2L--													
Oakwood Stock Farm (1)	56.0R	1-10"					10	10			20	20	
Oakwood Stock Farm	57.0R	1-14"			159	226	196	200	136	103	1020	191	
James Tobin	57.15R	1-7"				NO DIVERSION							
A. J. Thompson	57.3R					PLANT REMOVED							
A. J. Thompson	57.3R	1-5"				NO DIVERSION							
A. Calori	57.45R	1-3"				NO DIVERSION							
G. Gardella Company	57.5R	1-4"		5	8	7	12		2		34	10	
V. Sanguenetti	58.4R	1-2½"				NO DIVERSION							
G. B. Figari	58.6R	1-3"				2		1			3	1	
A. Mauro	58.7R	1-4"				NO DIVERSION							
--MOSSDALE BRIDGE - MILE 58.9 - RECORDING GAGE--													
C. C. Abersold	59.25R	1-6"			1	14	14	10	21		60	50	
H. A. Neistrath	59.3R	1-14"					138	118	88		344	115	
H. A. Neistrath	(2)60.1R	1-6"					12	18	12		42	52	
--PARADISE DAM - (HEAD OF PARADISE CUT) - MILE 62.2L--													
Banta Carbona Irrig. Dist.	67.5L	1-36"		1065	5777	5020	10488	7021	3397	1456	34224	(3)15598	
		2-20"											
		3-24"											
J. Y. Matsumoto (4)	70.0R	1-8"					2	5			7	20	
J. Y. Matsumoto (4)	70.5R	1-10"					46	52	16		114	125	
Reclamation District #2075	71.0R	1-16"				120	311	298	342	45	1116	1125	
Mortensen, Borges & Whitman	73.2R	1-12"						70	61		131	280	
J. Lawrence	75.0R					PLANT REMOVED							
Henry Gard	75.1R					PLANT REMOVED							
J. W. Cannon	75.2R					PLANT REMOVED							
S. G. Paxton	75.25R					PLANT REMOVED							
R. R. Swank	75.35R					PLANT REMOVED							
R. N. Janson	75.45R					PLANT REMOVED							
Ralph Martin	75.7R	1-7"				NO DIVERSION							
Ralph Martin	76.2R	1-6"				NO DIVERSION							
--U.S.G.S. GAGING STATION - SAN JOAQUIN RIVER NEAR VERNALIS - MILE 76.7--													
Totals			4	1086	6162	5944	12007	8735	4384	1762	40084	19298	
Average cubic feet per second			0	18	100	100	195	142	74	29	82		
Monthly use in per cent of seasonal			0.0	2.7	15.4	14.8	30.0	21.8	10.9	4.4			

*Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey of 1913-15).

(1) New installation 1941.
(2) Up Walthall Slough .2 mile and opposite this mileage on river.
(3) Includes 1562 acres served outside of District.
(4) Plant installed in 1937 but not previously reported.

TABLE 73

SAN JOAQUIN RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct		General	Rice
--U.S.G.S. GAGING STATION - "SAN JOAQUIN RIVER NEAR VERNALIS" - MILE 76.7--													
--STANISLAUS RIVER - MILE 79.7R--													
--MAZE ROAD BRIDGE - MILE 81.85--													
W. C. Blewett Estate	81.95L	3-12"		133	430	516	600	474	134	138	2425	710	
El Solyo Ranch	82.0L	1-12"		162	1591	1632	2032	1877	1441	788	9523	2806	
		3-18"											
--GRAZING STATION "SAN JOAQUIN RIVER AT HETCH HETCHY WATER SUPPLY CROSSING" - MILE 82.65--													
--TUOLUMNE RIVER - MILE 91.0R													
West Stanislaus Irrigation District	91.8L	3-26"			4916	5204	15304	10943	3546	1586	(1)41499	(1)2037	
El Pescadero Ranch #1	(2)91.8L	1-12"							114		114	41	
El Pescadero Ranch #2	(2)91.8L	1-14"						30	12		42	40	
El Pescadero Ranch #3	(2)91.8L	1-12"			5	13	7	21	23		69	75	
Burkhard Investment Company	(2)91.8L	1-14"		7	32	9	54	28	35		165	92	
--LAIRD SLOUGH BRIDGE - GAGING STATION - "SAN JOAQUIN RIVER NEAR GRAYSON" - MILE 96.05--													
Rancho El Pescadero (Houck Bros.)	98.9L	(3)1-16"				114	163	43	75	22	(3) 417	68	
--PATTERSON BRIDGE - MILE 104.4													
Patterson Water Company	104.4L	1-14" 1-18" 1-26"			5995	6639	7069	6021	5736	977	32437	13555	200
Turlock Garden Land Co. (Jones)	104.5R	1-10"			30	74	40	74	61		279	90	
Mortgage Guarantee Company	106.5R	1-6"				NO DIVERSION							
		1-10"											
Patterson Ranch Company	109.8L	1-12"			482	1127	1024	1168	1400	377	5578	(4)1067	284
		2-16"											
E. Ustick	112.55R	1-16"			92	55	89	90	99	39	(5) 464	(5) 300	
--CROWS LANDING BRIDGE - MILE 113.4--													
Laura C. Johnson	113.5R	1-10"				NO DIVERSION							
A. J. Silveria	113.85R	1-6"				NO DIVERSION							
A. J. Silveria	114.35R	1-8"						14	3	10	27	25	
F. Dutcher	114.95R	1-10"				NO DIVERSION							
L. B. Crow	116.05R	1-14"			60	103	102	57	46	10	378	160	
Oscar Hogan	116.45R	1-12"				NO DIVERSION							
C. L. Olinger	116.95R	1-12"				NO DIVERSION							
--U.S.G.S.GRAZING STATION "SAN JOAQUIN RIVER NEAR NEWMAN" - MILE 123.7--													
--MERCED RIVER - MILE 123.75--													
Stevinson Water District	129.4R	1-10"				NO DIVERSION							
--FREMONT FORD BRIDGE GAGING STATION - MILE 129.5													
--DELTA BRIDGE (TURNER ISLAND) GAGING STATION - MILE 158.7													
Totals			0	302	13633	15486	26484	20840	12725	3947	93417	39866	484
Average Cubic feet per second			0	5	222	260	431	339	214	64	192		
Monthly use in per cent of seasonal			0	0.3	14.6	16.6	28.4	22.3	13.6	4.2			

*Mileage along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey of 1913-15).

(1) Includes 400 acres outside of District for which 220 acre feet were delivered

(2) Pump is on cut leading to West Stanislaus Irrigation District plant.

(3) New unit installed 1941. Additional water received from wells.

(4) Includes 40 acres outside district.

(5) Some additional water received from Turlock Irrigation District spill.

TABLE 74

MERCED RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--GAGING STATION "MERCED RIVER NEAR MOUTH" - MILE 1.1--													
Stevinson Water District	3.8R	1-15"				242	248	327	471		1288	320	
Andrew Raylo	4.0L	1-8"				NO DIVERSION							
Andrew Raylo	4.2L	1-4"				NO DIVERSION							
H. De Angelos	5.8L	1-10"			38	67	62	39	32	14	252	82	
J. F. Peck	6.1L	1-18"				NO DIVERSION							
Stevinson Water District	6.55L	1-15"				NO DIVERSION							
Francis Hartman	8.5L	1-12"				NO DIVERSION							
Mary Collier	8.85L	1-8"			9	24	11	4	7	8	63	45	
Grace McCullough	9.4L	1-10"			75	330	204	129	98	62	898	310	
R. W. Adams & J. B. Silva	10.35L	1-8"			192	198	295	210	127	30	1052	506	
		1-10"											
W. D. Adams	10.8R	1-8"						4			4	40	
W. D. Adams	10.85L	1-12"			125	74	201	138	109	16	663	318	
C.G. McLaughlin	11.4L	1-8"				NO DIVERSION							
C. G. McLaughlin	11.55L	1-4"					1	1	1		3	5	
L. E. Milliken & Edna McKinley	11.6L	1-10"			81	68	80	51	7		287	142	
J. Regello	11.6L	1-12"					64				64	140	
--NEW MILLIKEN BRIDGE - MILE 11.65--													
A. J. Azevedo	12.35L	1-10"				38	76		62	1	177	90	
Pacific Coast Joint Stock Land Bank	12.85L	1-10"			7	103	27	18	13		168	52	
Capital Company (1)	16.5L	1-12"			51	46	83	74			254	100	
Merced River Farms Company	17.05L	1-6"			1	3	8	4	1	1	18	18	
--U.S.G.S. GAGING STATION "MERCED RIVER NEAR LIVINGSTON" - MILE 17.1--													
R. G. Woodward	17.3L	1-4"						2	4	2	8	4	
J. Clark	17.7L	1-3"							1		1	4	
		1-6"											
O. B. Daniels	17.7L	1-5"			1	2	2		5		10	6	
Rhiners and Laramore (2)	18.4L	(3)1-6"				4	4	3	5		16	6	
C. P. Hockett	18.45L					PLANT REMOVED							
John Reininghaus	20.4L	1-6"			25	58	56	34			(4) 173	(4) 70	
W. J. Hoskins	20.65R	1-3½				1	1	2	2	1	7	9	
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - 21.05--													
A. C. Jorgensen	21.1R	1-6"					7	8	7		22	30	
A. C. Jorgenson	22.2R	1-12"					61	22	46		129	100	

*Mileage along river above mouth.
(1) Formerly California Lands Inc.,
(2) Formerly Federal Land Bank.
(3) 4" unit removed.
(4) Additional water received from well.

TABLE 74 (CONTINUED)

MERCED RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
A. C. Jorgensen	23.3R	1-6"				NO DIVERSION							
M.McConnell	23.4L	1-5"				NO DIVERSION							
T. Nishihara (1)	24.0R	1-4"				4	4				8	12	
W. F. McConnell	24.2L	1-5"				NO DIVERSION							
W. F. McConnell	24.5L	1-6"				NO DIVERSION							
T. Nishihara (2)	24.6R	1-6"				NO DIVERSION							
T. Nishihara (2)	25.0R	1-5"			14		15	14	10		53	55	
T. Nishihara (2)	25.5R	1-6"			9	5	21	11	4	2	52	30	
Merced River Farms Association	26.3R	1-8"			96	78	82	95	22	39	412	95	
W.C. Magneson	26.55R	1-5"			4	7	12	14	8	7	52	31	
W.C. Magneson	27.0R	1-6"						1			1	8	
--SANTA FE RAILROAD CROSSING- MILE 27.05--													
W. C. Magneson	27.6R	1-10"				21	15	11	54		101	95	
T. Nishihara	27.8R	1-4"			3	8	2	1			14	28	
Y.Tanabe	28.1R	1-6"				7	3	13	15	5	43	15	
G. H. Lovely	28.4R	1-4"				14	1				15	20	
J. Campadonica	28.6R	1-6"				NO DIVERSION							
D. S. Enright	28.6R	1-5"			13	23	21	15	6	7	85	49	
		1-8"											
C. L. Mehrton	29.1R	1-7"			30	11	14	47	43		145	(4) 50	
Tony Demchilli	29.75R	1-6"				9	10	6	11	1	37	(5) 53	
American Trust Company	29.9R	1-6"						18			18	12	
Capital Company (2)	30.2L	1-6"				22	7	29			58	15	
American Trust Company	30.95R	1-12"				15	49	18	45	40	167	150	
Capital Company (2)	31.1L	1-8"				20	35	28	25		108	25	
T. H. Carlon (6)	31.5R	1-6"			52	92	100	111	65		420	150	
		1-8"											
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH)- MILE 32.52--													
B. H. Arkellian	32.9R	1-8"					19				(7) 19	50	
B. H. Arkellian	33.55R	1-7"			44	50	70	35			(7) 199	180	
C. P. Stout	39.2L	24"Box					24				24	50	
--GAGING STATION "MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING" - MILE 42.1--													
Totals			0	0	870	1644	1995	1537	1306	236	7588	3570	0
Average cubic feet per second			0	0	14	28	32	25	22	4	16		
Monthly use in per cent of seasonal			0	0	11.4	21.7	26.3	20.3	17.2	3.1			

*Mileage along river above mouth.

(1) New installation 1941.
(2) Formerly California Lands Inc.
(3) Formerly M. Nishihara.
(4) An additional 13 acres served for plant at Mile 29.75R.
(5) An additional 13 acres served through plant at Mile 29.1R.
(6) Formerly listed as T. H. Carlos.
(7) Additional water received through pump on slough.

TABLE 75

TUOLUMNE RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
E. T. Mapes	1.9R	1-14"			139	98	64	42	55	33	431	(1)200	
J. DeSouza and J. B. Silva	2.2R	1-6"						10	9	9	28	25	
E. B. Henry	3.1R	Box 1-16"						23	16		39	28	
--GAGING STATION "TUOLUMNE RIVER AT TUOLUMNE CITY - MILE 3.35--													
Bancroft Fruit Farms	4.1R	1-10"		118	93	228	61	47	14	11	572	(2) 245	
Bancroft Fruit Farms	5.0R	1-10"		2	75	62	85	67	50	36	377	(3)	
Randolph Marketing Company	7.1R	1-10"			64	80	114	179	144	31	612	200	
W. F. Duffy (4)	7.2R	1-5"				2	5	5	2		14	15	
J. J. and E. J. Schivo	7.8L	1-10"					NO DIVERSION						
W. F. Duffy	7.9R	1-4"					NO DIVERSION						
W.F. Duffy	8.4R	1-10"			78	98	51	84	74	26	411	60	
Otis Burch	9.2L	1-4"						1	2	1	4	5	
A.Holmes (Lionudakis)	10.2R	1-11"			53	52	67	60	35	14	281	55	
F. Strangio (5)	15.25R	1-6"					46				46	20	
G. B. and L. D. Podesto (6)	15.75R	1-3"		2	4	5	7	8	6	1	33	15	
--GAGING STATION "TUOLUMNE RIVER AT MODESTO - MILE 15.75--													
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 15.8--													
--DRY CREEK INFLOW - MILE 16.5R--													
Mrs. L. R. Hughson	20.3R	1-8"				19	10				29	35	
W. J. Leckron	20.5R	1-10"						9	8	8	25	52	
--SANTA FE RAILROAD - MILE 21.6--													
P. L. Alexander	25.0L	1-6"				6	7	3			16	25	
P. L. Alexander	26.0L	1-7"						23			23	31	
		(7) 1-8"											
P. L. Alexander	26.1R	1-6"						7			7	12	
		(7) 1-8"											
L. Firpo	27.1L	(8) 1-10"			4	7	20	12			43	72	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) - MILE 31.5--													
--GAGING STATION "TUOLUMNE RIVER AT HICKMAN BRIDGE " - MILE 31.7--													
George H. Sawyer	39.8L	1-6"			9	28	66	27	23	3	156	200	
--GAGING STATION "TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE" - MILE 39.9--													
Totals			0	122	519	685	603	607	438	173	3147	1295	
Average cubic feet per second			0	2	8	12	10	10	7	3	6		
Monthly use in per cent of seasonal			0	3.9	16.5	21.8	19.1	19.3	13.9	5.5			

*Mileage along river above mouth.

(1)This is the acreage estimated served from river supply. A total of 1520 acres irrigated with water from river and Modesto Irrigation District spill.

(2)This is the total acreage served by this plant and the one at Mile 5.0R.

(3)See plant at Mile 4.1R.

(4)New installation 1941.

(5)Old installation - not previously reported.

(6)Installed 1939 - not previously reported.

(7)Unit added in 1941.

(8)Replaces 6" unit.

TABLE 76

STANISLAUS RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and size of Pump	Monthly Diversions in Acre-feet							Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
Frank Coker	1.1R	1-6"				NO DIVERSION						
Mrs. E. W. Hawkins	1.6R	1-4"				NO DIVERSION						
J. Chisholm	2.9R	1-8"				NO DIVERSION						
J. W. Smith	3.1R	1-6"				NO DIVERSION						
Will Hawkins	3.2R	1-4"				NO DIVERSION						
Winfield S. Overton (1)	5.25L	2-14"			16	377	322	248	173	62	1198	160	110
--GAGING STATION "STANISLAUS RIVER AT BRET HARTE PUMP" - MILE 5.9--													
Reclamation District #2064 (Bret Hart Water Users Ass'n) (2)	5.9R	1-16"		117	814	766	669	887	620	312	(3) 4185	(3)900	
McMullin Rec'l. Dist. #2075	5.95R	2-16"		53	715	655	757	844	471	446	(4) 3941	(4)1630	
Henry Pelucca	6.7L	1-15"			71	95	71	74	60	12	383	78	
J. W. Updike	7.4L	1-8"				NO DIVERSION							
C. C. Updike	8.2L	1-12"				36	41	42	19		138	65	
Caswell Bros.	9.8R	1-14"	12	87	178	237	313	279	297	96	1499	289	
Pacific States Savings and Loan Co.	10.0R	1-10"		95	336	278	285	272	251	125	1642	200	
D. F. Koetitz	10.1L	1-10"		34	152	134	202	240	170	88	1020	300	
D. F. Koetitz	10.4L					PLANT REMOVED							
Joseph Hertle	10.5L	1-10"			13	19	17	16	7		72	30	
--SOUTHERN PACIFIC RAILROAD BRIDGE (MAIN LINE) - MILE 15.9--													
--GAGING STATION "STANISLAUS RIVER NEAR RIPON" - MILE 16.0--													
American Trust Company (5)	18.5R	1-12"				10	17	17	10		54	70	
Dr. Rollin Reeves (6)	20.75R	1-14"			81	49	353	81	202		766	178	
Heath Ranch	20.9L	1-5"			8		20	30	15		73	15	
Earl Fruit Company	21.75R	1-8"				66	15				81	90	
Cornelious de Boer	22.0L	1-5"				NO DIVERSION							
Riverside Ranch	22.3R	1-5"					6				6	7	
		1-6"											
		1-10"											

*Mileage along river above mouth.

(1) Formerly Hatmark Ranch.

(2) Formerly listed as Bret Hart Water Users Association. (R. D. #2064)

(3) Additional water received from plant at Mile 5.95R for partial irrigation of 90 acres.

(4) See diversion note for plant at Mile 5.9R.

(5) Formerly J. E. Alldrin.

(6) Formerly Palo Alto Company.

TABLE 76 (CONTINUED)

STANISLAUS RIVER DIVERSIONS - 1941

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions in Acre-feet								Total Diversion March to October Acre-feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.		General	Rice
--MODESTO-ESCALON BRIDGE - MILE 28.15--													
--SANTA FE RAILROAD CROSSING - MILE 31.85--													
--GAGING STATION "STANISLAUS RIVER AT RIVERBANK" (BURNEYVILLE BRIDGE) - MILE 32.0													
Oakdale I. D. (Riverbank Pump) (1)	32.9L	(2) 1-10"		6	65	87	135	24	116	139	572	1700	
Oakdale I. D. (Crawford Pump) (1) (3)	35.9L	1-14"			247	270	99	122			738	692	
Oakdale I. D. (Brady Pump) (1)	37.0L	1-14"				94	91	52	55		292	536	
Oakdale I. D. (Orange Blossom Pump) (1)	(4) 45.4R	1-10"	NO DIVERSION										
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) - MILE 39.0--													
-- GAGING STATION "STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE" - MILE 44.7--													
Totals			12	392	2696	3173	3413	3228	2466	1280	16660	6940	110
Average cubic feet per second			.2	7	44	53	56	53	41	21	34		
Monthly use in per cent of seasonal			0.1	2.3	16.2	19.0	20.5	19.4	14.8	7.7			

*Mileage along river above mouth.

(1) Oakdale Irrigation District maintains river plants at Miles 32.9L, 35.9L, 37.0L, and 45.4L to supplement Districts gravity supply.

(2) Formerly listed as 14" pump.

(3) Formerly listed as Kaufman pump.

(4) Formerly listed as being at Mile 44 R

CHAPTER IV

MEASUREMENTS OF RETURN WATER

Sacramento Return Waters

In the Sacramento Valley the flow of all well defined channels carrying irrigation waters returned to the Sacramento River is measured and recorded. Table 78 lists these channels in downstream order and gives the total flow as computed from the measurements. The report for 1941 gives, for most of the channels, the flow for the entire year.

Between Colusa and Red Bluff there are no large well defined return flow channels. Records or estimates of natural inflow from streams in this stretch of the river were, however, obtained. Above Red Bluff, from a point below Cottonwood to Redding there is considerable return from the Anderson-Cottonwood Irrigation District, but it is not recorded.

Return Flow from Other than Sacramento River Sources

In the water returned to the Sacramento River as included in Table 78, it should be noted that practically all of that entering the river through Butte Slough is derived from Feather River diversions through the Western and Sutter Butte canals. Of the discharge entering through Sacramento Slough, that portion flowing down the East Borrow Pit of Sutter By-Pass, is also practically all of Feather River origin. (See Table 101.)

Relation of Sacramento Return Water to Irrigation Draft

Tables 79 and 80 record the Sacramento River return water for the period June to November, inclusive, 1941, and indicate the relation between the return and the diversions from which it was derived. Due to high water conditions prevailing in the Spring and in December, it was not practicable

to attempt to determine the return flow for the period January to May inclusive or for December. Since, in Tables 79 and 80 it is the purpose to show the return water from Sacramento River diversions only, the inflow from Butte Slough, that portion of Sacramento Slough derived from Feather River sources (Table 101) and from the Feather and American Rivers has been excluded. In Table 79 is shown the relation to the diversions of that return water only which was measured at the well defined channels. With the records available of the discharge of the Sacramento River at Red Bluff, Butte City, Colusa, Wilkins Slough, Knights Landing, and Verona and all diversions between these points, it is possible to approximate the total water returned to the river between each of those points, including not only the flow in the definite channels which were measured, but all seepage, ground water return, etc., which could not be directly measured. The figures for the return water computed in this manner and the relation of this return shown for the Verona-Sacramento section is only that contributed by the measured drains since, as explained in Chapter II, the total return in this section, including all accretions, is not susceptible of computation in the manner outlined because of the fact that no record of low water flow actually measured at Sacramento is available.

The data in Tables 79 and 80 show that seepage, groundwater return, etc., (for the period July-September, inclusive) which could not be directly measured, amounted to 18 per cent of the irrigation draft, the direct return in definite channels 38 per cent, the total return being 56 per cent. The data in Table 80 shows the return flow in the Sacramento River for the period June to November, inclusive, 1941. The return flow for the balance of the year has not been computed as the flows in the stream

were large and there was much rainfall and local drainage so that it would not be practical with the data available to attempt to determine the return flow for the period not shown in the Table.

In Table 80a the return flow and accretion for the entire Sacramento Valley have been determined for the period July to September for the years from 1931 to 1941, inclusive. In the computations for this table only major inflows were taken into account, the inflow of all minor creeks was not included for during the months July to September their flow is negligible.

Draft Return Water Relation for Particular Sacramento Valley Areas

In the Sacramento Valley there are certain units or districts which are set apart physically by levees or otherwise, so that the direct return water in each district may be readily segregated when the records of all diversions to and discharges from the units are available. Included in such units are the areas above the Colusa-Williams highway crossing of the Colusa Trough, Reclamation Districts 70, 108, 1500 and 1000. The relation between draft and return water for the Colusa Trough area is shown in Table 81 and for Reclamation Districts 70, 108, 1500 and 1000 in Tables 82, 83, 84 and 85 respectively. As in the case of the return water computations for the Sacramento River, no attempt has been made to present the data for the entire year, as there probably was much seepage into the districts due to high river stages. Should it be desired to make a detailed study of these return and seepage flows for the entire year the annual pumping from the various districts is given in the return flow tables and the annual precipitation records for rainfall stations in the valley are given in Tables 111 to 122.

Tables 88 to 110, inclusive, present in detail the discharge records for the Sacramento Valley return water channels.

San Joaquin Return Waters

In the 1941 San Joaquin Valley return water measurements, the gaging stations were located at the same points as in previous years beginning with 1928, and the same methods were followed. A continuous record of the discharge during the entire year was obtained at most stations on each stream. An upper and lower station were maintained on each stream, to-wit: San Joaquin, Merced, Tuolumne and Stanislaus rivers. On all of the streams continuous records of discharge were also obtained at intermediate stations--four on the San Joaquin River, (1) at Fremont Bridge, (2) just below the junction with the Merced River (maintained by the U. S. Geological Survey and referred to as "San Joaquin River near Newman"), (3) near Grayson (Laird Slough), and (4) at the Hetch Hetchy Water Supply Crossing below the Tuolumne River inflow; two on the Merced River, (1) near Livingston (U. S. Geological Survey station), (2) at Cressey Bridge; three on the Tuolumne River, (1) at Roberts Ferry, (2) at Hickman Bridge, (3) at Modesto; and two on the Stanislaus River (1) at Burneyville Bridge and (2) near Ripon. Measurements and records of all pumping diversions between stations on each stream were obtained, thereby completing the necessary data for the computations of the return water. The records for the gaging stations are given in Chapter II, Tables 21 to 42, inclusive, and the diversion records for the San Joaquin streams above Durham Ferry Bridge, are given in Chapter III, Tables 73 to 76, inclusive.

Table 86 tabulates the results of the San Joaquin return water measurements and Table 87 shows a comparison of the return water with the irrigation draft in the San Joaquin Valley.

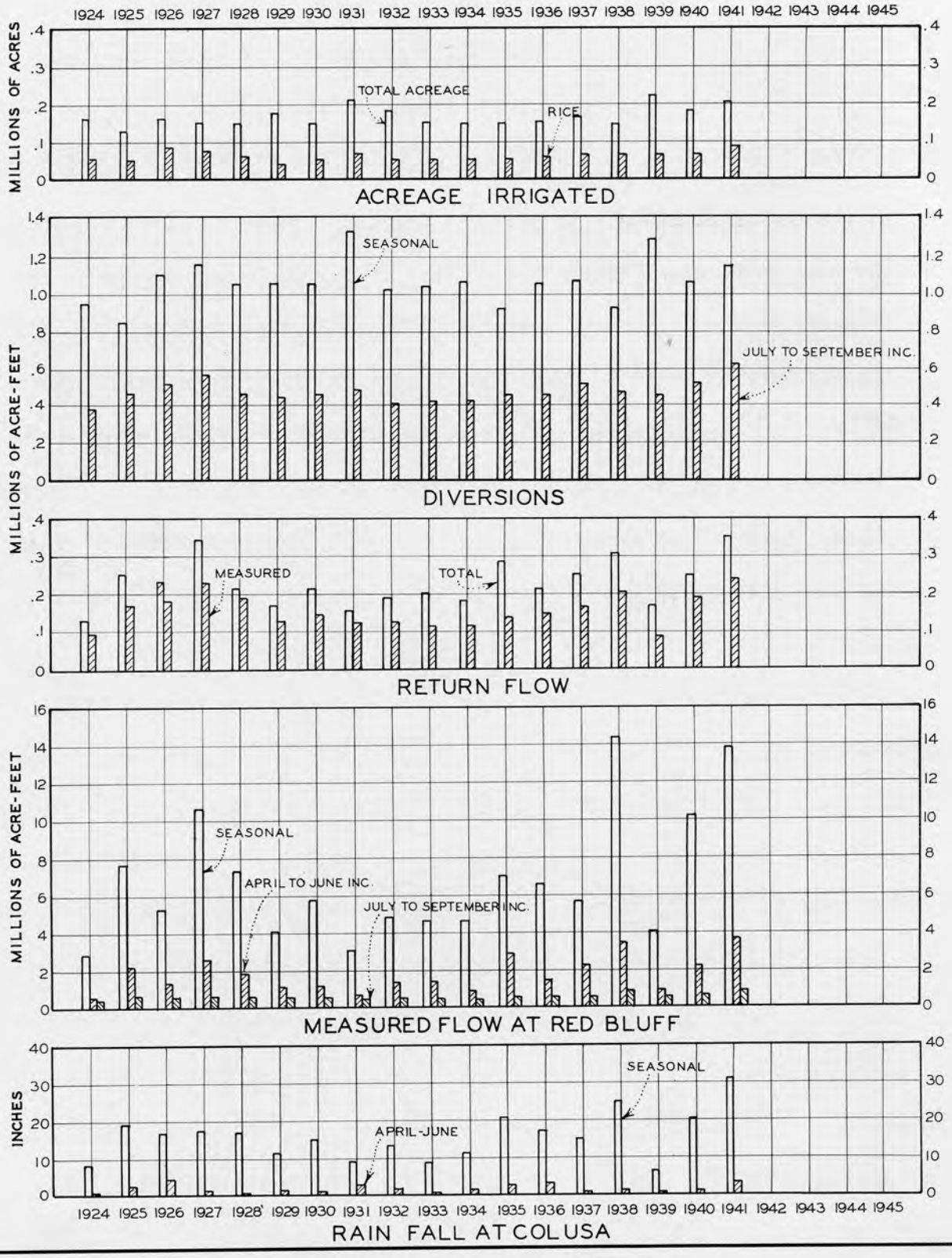
Comparative Sacramento and San Joaquin Return Water, 1924-1941

Comparative figures, 1924 to 1941, for the Sacramento and San Joaquin seasonal return water in per cent of the irrigation draft are shown in Table 77. In order to show graphically for the Sacramento River the variation from year to year of the measured flow at Red Bluff, the return flow and irrigated acreage Plate I was prepared. While no definite conclusions can be reached it appears that there may be some relation between the seasonal flow and the return flow.

In the case of the San Joaquin return water data there appears to be no definite relation between the seasonal flow of the San Joaquin and its tributaries in per cent of normal and the return water percentages. This may be due to the regulation which occurs in Lake McClure reservoir on the Merced River, Don Pedro Reservoir on the Tuolumne River and Melones Reservoir on the Stanislaus River. It is to be noted that in some years the period used in the comparison of return flow and diversions makes considerable difference in the percentage figures, and further, that for the period August-September only, the percentage is nearly always greater than when the July-September period is used. As there may be a considerable lag between the diversions and corresponding return flow, the figures in the last column of Table 77 were compiled to show the August-September return flow in per cent of the July-August diversions. These percentages still seem to bear no definite relation to the seasonal runoff

percentages, but their variation from year to year is somewhat reduced and a more or less constant percentage of return flow is indicated.

The average percentage of diversions occurring as return water in the San Joaquin River is shown to be considerably smaller than that for the Sacramento River (Table 77). This difference may probably be attributed to the fact that, whereas due to basin topography practically all drainage from Sacramento River diversions is quickly returned to the river; in the San Joaquin Valley considerable of the return water may never reach the river because of its contributing to underground water and being recovered by drainage pumps in low areas of many of the irrigation districts for re-use in their irrigation canals.



SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

SACRAMENTO RIVER

RED BLUFF TO SACRAMENTO

ACREAGE IRRIGATED, DIVERSIONS, RETURN FLOW, STREAM FLOW AND RAIN FALL

1924-1941

TABLE 77

SACRAMENTO AND SAN JOAQUIN RETURN WATER PERCENTAGES 1924-1941

Year	Sacramento River: Seasonal Run-off at Red Bluff in per cent of normal *	Sacramento River: Return Water in per cent of Diversions: Jun.-Sep. inc.	Sacramento River: Return Water in per cent of Diversions: Jul.-Sep. inc.	San Joaquin River and Tributaries: Seasonal Run-off in per cent of Normal S.J.River and tributaries**	San Joaquin River and Tributaries: Return Water in per cent of Diversions: Jun. Sep. inc.	Jul. Sep. inc.	Aug. Sep. inc.	Jul. Oct. inc.	Aug. Oct. inc.	Aug.-Sep. Return in per cent of Jul.-Aug. Diversions
1924	38	33	33	24		35	41			29
1925	92		55(1)	86			38			23
1926	65	49	45	56		28	32			22
1927	125	66	59	104			32			23
1928	87	49	46	70		28	28			23
1929	50	42	39	46		19	21			16
1930	70	55	47	53	20	21	22			17
1931	38	33(2)	32	27	23(3)	27	40			18
1932	58	56	47	106			26		29	21
1933	52	56	48	54		22	20	25	25	17
1934	51	45	41	37	20(4)	21	28	25(5)	33	16
1935	86		62	103		30	24	34	31	19
1936	81	56	47	104		31	25	35	32	20
1937	60		40	105		35	28	38	35	22
1938	160		64	100			41		47	29
1939	50	38	36	46	20	20	23	24	29	17
1940	120	55	48	105		25	25	27	29	19
1941	164	69	56	127	27	32	28	35	33	21

* 50-year mean (1889-1939) of natural run-off. For comparison of 40 and 50 year means see Tables 1, 2 and 3.

** 50-year mean (1889-1939) of natural run-off at foothill stations of San Joaquin, Merced, Tuolumne and Stanislaus Rivers. For comparison of 40 and 50 year means, see Tables 1, 2 and 3.

(1) July-October, inclusive, 59.

(2) May-September, inclusive, 34.

(3) May-September, inclusive, 19.

(4) May-September, inclusive, 20.

(5) June-October, inclusive, 23; May-October, inclusive, 21.

TABLE 78

WATER DISCHARGED TO THE SACRAMENTO RIVER ABOVE SACRAMENTO AS MEASURED AT DEFINITE RETURN FLOW CHANNELS
1941

Return Flow Channel	Table No.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	June to October	July to October
		Acre-feet													
Butte Slough (1)	89	0	6800	8450	4730	0	5070	1270	12990	16760	14800	24920	16190	50890	45820
R. D. 70 Drain	95	5350	5030	5480	5500	1820	1450	810	1450	1200	480	360	1180	5390	3940
R. D. 108 Drain	96	17860	17540	17720	13560	5280	9190	7360	10220	11330	3670	1580	6930	41770	32580
Colusa Basin Drainage (2)	98	0	0	0	0	0	30810	24760	33410	42110	24580	12570	290	155670	124860
Sycamore Slough	99	0	0	0	0	0	50	290	720	400	170	30	0	1630	1580
Sacramento Slough (3)	100	(4)	(4)	(4)	(4)	(4)	(4)	33500	38300	39300	21700	17300	(4)	---	132800
R. D. 1001 Drain (5)	108	16200	15700	10600	11800	1990	800	310	100	0	0	0	1480	1210	410
R. D. 1000 Drain #3	109	6430	8210	8380	7140	4140	780	120	400	2130	970	500	2480	4400	3620
R. D. 1000 Drain	110	16500	12200	6640	7000	180	0	0	0	490	140	160	0	630	630
Totals	--	--	--	--	--	--	--	68420	97590	113720	66510	57420	--	--	346240

(1) This flow except during high water periods is practically all of Feather River origin.
(2) A portion of the water which normally should return to the Sacramento River at this point is diverted to the Knights Landing Ridge Cut. (See Table 105)
(3) This is the measured flow and includes Feather River diversions. (See Table 101 for segregation of waters).
(4) See footnote Table 100.
(5) Discharged to main drain between Reclamation District 1000 and 1001, thence to Sacramento River at Mile 19.6L.

TABLE 79

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO (USING ONLY RETURN WATER WHICH ENTERED THROUGH DEFINITE RETURN CHANNELS*) - 1941

Return Flow Channel	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	January to December	June to Sept.	July to Sept.
	Acre-feet														
R. D. 70 Drain	5350	5030	5480	5500	1820	1450	810	1450	1200	480	360	1180	30110	4910	3460
R. D. 108 Drain	17860	17540	17720	13560	5280	9190	7360	10220	11330	3670	1580	6930	122240	38100	28910
Colusa Basin Drainage**	(1)	(1)	(1)	(1)	27900	44850	28020	37380	45720	24850	12600	26780	---	155970	111120
Sacramento Slough	(2)	(2)	(2)	(2)	(2)	(3) 30000	29390	30720	34280	6700	4400	(2)	---	124390	94390
R. D. 1000 Drains	22930	20410	15020	14940	4320	780	120	400	2620	1110	650	2480	85780	3920	3140
Total Return	---	---	---	---	---	86270	65700	80170	95150	36810	19590	---	---	327290	241020
Diversions (Red Bluff to Sacramento)	0	0	1830	5220	136400	205200	240600	235500	154400	35540	0	0	1015000	835700	630500
Return in % of diversions	---	---	---	---	---	42	27	34	63	---	---	---	---	39	38

NOTE: In order to show return water from Sacramento River irrigation only, the discharge to the river of Butte Slough is excluded, as is also the portion of the return through Sacramento Slough derived from Feather River diversions (Table 101) the surplus water diverted to Sutter By-Pass from Butte Slough and the discharge from Reclamation District 1001.

* As distinguished from use of all accretions as indicated in Table 80.
** Figures include water diverted to Knights Landing Ridge Cut (Table 105) and outflow from Sycamore Slough (Table 99).
(1) High stages prevailed. See Table 105.
(2) See footnotes Tables 100 and 101.
(3) Estimated. Balance of flow assumed to be runoff of winter flow stored in By-Pass area.

TABLE 80

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO (INCLUDING ALL ACCRETIONS)* - 1941

River Section	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan-Dec
	Acre-feet												
Return Flow													
Red Bluff to Butte City						65800	30600	8800	-300	-4000	-3300		
Butte City to Colusa						29100	8400	10400	6200	6700	8800		
Colusa to Wilkins Slough						26200	19400	11800	6200	-4000	-9100		
Wilkins Slough to Knights Ldg.						51500	43000	47000	41900	4400	6400		
Knights Landing to Verona	- - - - - - -		(1)	- - - - - - -		49900	27600	48300	43400	22700	-4000	- - (1) - -	
Verona to Sacramento						800	100	400	2600	1100	700		
Total Return						223300	129100	126700	100000	26900	-500		
Total Diversion													
Red Bluff to Sacramento	0	0	1830	5220	136400	205200	240600	235500	154400	35540	0	0	
Return in per cent of draft						109	54	54	65	76	---		
Monthly return in % of seasonal						---	---	---	---	---	---		

River Section	Return Flow Acre-feet		Red Bluff to Lower End of Section						In River Section			Red Bluff to Lower End of Section		
			Return Flow Acre-feet		Diversions Acre-feet		Return flow in % of Diversion		January to December			January to December		
	June to Sept.	July to Sept.	June to Sept.	July to Sept.	June to Sept.	July to Sept.	June to Sept.	July to Sept.	Return	Diversion	Return in % of Diver.	Return	Diversion	Return in % of Diver.
Red Bluff to Butte City	104900	39100	104900	39100	407987	304469	26	13						
Butte City to Colusa	54100	25000	159000	64100	423184	317040	38	20						
Colusa to Wilkins Slough	63600	37400	222600	101500	672034	504189	33	20						
Wilkins Sl. to Knights Ldg.	183400	131900	406000	233400	752024	567153	54	41	- - - - (1) - - - - - - - - - -			(1) - - - -		
Knights Ldg. to Verona	169200	119300	575200	352700	774369	583809	74	60						
Verona to Sacramento**	3900	3100	579100	355800	835833	630587	69	56						
Total	579100	355800												
Diversions (Red Bluff to Sacramento	835700	630500												
Return in % of diversions	69	56												

NOTE: In the return water here shown, the discharge to the Sacramento River of the Feather and American rivers is excluded as is also the discharge of following return water channels, Butte Slough and that portion of the discharge of Sacramento Slough derived from Feather River waters. Also inflow from Mill, Antelope, and Deer Creeks between Red Bluff and Butte City has been excluded. The diversion to the Ridge Cut from Colusa Basin drainage has been credited as return flow.

(1) Due to high water which occurred in spring of 1941 and in December no attempt was made to determine return flows and percentages for those periods.

* As the return water in this table between any two stations is computed as the difference in discharge between the upper and lower station, making due allowance for the intervening diversions, the results include both those accretions entering from definite return channels which have been measured and accretions due to seepage, groundwater return, etc., which cannot be directly measured.

** See discussion in text of Chapters II and IV.

TABLE 80A

RETURN FLOW AND ACCRETIONS FOR PERIOD JULY - SEPTEMBER 1931 TO 1941
SACRAMENTO VALLEY; RED BLUFF TO SACRAMENTO

(ACRE-FEET)

	1941													
	July	Aug.	Sept.	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
1 - Inflow (1)														
Sacramento River at Red Bluff	375700	291700	265600	933000	675400	557500	855800	595400	590600	579700	482000	527000	518000	485000
Feather River at Oroville	169300	125800	111700	406800	358800	276600	487900	321200	396100	353400	263600	253500	286100	214800
Yuba River at Smartville	96200	26800	20600	143600	62400	38900	136500	65700	71900	69900	33600	53400	65400	26700
American River at Fairoaks	81100	28200	21100	130400	93300	23100	193500	90600	137400	92000	32600	62800	123900	18000
1 - Total inflow (1)	722300	472500	419000	1613800	1189900	896100	1673700	1072900	1196000	1095000	811800	896700	993400	744500
2 - Outflow														
Sacramento River at Sacramento	548000	279000	308000	1135000	713700	376100	1371200	588400	743700	741600	338400	446100	579000	217300
Yolo By-Pass opposite Sacramento	5200	4300	3900	13400	5900	3800	800	3700	8300	2000	3900	1000	1300	0
2 - Total outflow	553200	283300	311900	1148400	719600	379900	1372000	592100	752000	743600	342300	447100	580300	217300
3 - Diversions														
Sacramento River	240600	235500	154400	630500	533000	467500	482900	523800	462700	456000	438100	425600	403100	488100
Colusa Trough	6500	7500	5600	19600	21300	16300	3100	14200	15500	2300	3500	0	1700	5600
Back Borrow Pit	6300	4900	3300	14500	11300	16000	9600	13100	9700	10200	13600	9300	11800	10000
Lower Butte Creek and slough	2500	2700	9200	14400	18100	16500	23300	15000	13600	9600	4400	21000	13900	9900
By-Pass and Drainage Channels	11400	10400	6400	28200	21100	30400	9300	92200	29900	20100	29600	13200	14500	20300
Feather River	103300	100400	78400	282100	258000	213100	290900	279000	246100	229500	197900	234600	242200	193200
Yuba River	13600	13400	10700	37700	37800	33900	27700	28400	28200	28000	23200	29500	25100	24500
American River	1400	1100	600	3100	3500	3400	3000	3600	2900	2700	2700	2600	3100	2700
3 - Total Diversions	385600	375900	268600	1030100	904100	797100	849800	899300	808600	758400	713000	735800	715400	754300
Return flow & accretion(2+3-1)	216500	186700	161500	564700	433800	280900	548100	418500	364600	407000	243500	286200	302300	227100
Total gain in % of diversions	56	50	60	55	48	35	64	47	45	54	34	39	42	30
Seasonal flow in % of normal(2)				142	118	43	167	70	92	87	45	46	69	32

(1) Only major flows considered. Flow of tributary creeks negligible during late summer months.
(2) Normal taken as 50 year (1889-1939) mean of natural runoff at foothill stations.

TABLE 81

RELATION BETWEEN THE RETURN WATER IN COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY
AND
THE PRINCIPAL DIVERSIONS FROM WHICH THE RETURN WATER WAS DERIVED - 1941
(Acre-feet except as noted)

Diversion	Mile and Bank	May	June	July	Aug.	Sept.	Oct.	June to Sept. (inc.)	July to Sept. (inc.)	Acreage Irrigated: General	Acreage Irrigated: Rice
Sacramento River (Table 62)											
Glenn Colusa Irrigation District	154.8R	37900	76600	85300	82900	59700	25300	304500	227900	29120	28650
Jacinto Irrigation District	154.8R	1350	3300	3760	3790	3070	1860	13920	10620	6538	0
Compton Delevan Irrigation District	154.8R	1280	1850	1840	1840	660	0	6190	4340	1146	1093
Provident Irrigation District	154.8R	6350	9500	7900	7650	6740	1220	31790	22290	655	6812
Princeton-Codora-Glenn Irrigation Dist.	154.8R	5950	10600	11500	11500	7720	1780	41320	30720	2228	2163
Maxwell Irrigation District	154.8R	250	490	490	490	740	1450	2210	1720	1200	0
Colusa Trough Plants (Table 63)	--	3320	5170	6500	7460	5550	2240	24680	19510	240	1280
Totals		56400	107510	117290	115630	84180	33850	424610	317100	41127	39998
Return Flow											
Colusa Trough at Colusa-Williams Highway (1)		35160	43650	35200	42320	43500	20240	164670	121020		
Colusa Trough diversions		3320	5170	6500	7460	5550	2240	24680	19510		
Total return (Acre-feet)		38480	48820	41700	49780	49050	22480	189350	140530		
Total return (Average cubic feet per second)		626	820	678	810	824	366	783	770		
Return in per cent of diversions		68	45	36	43	58	66	44	44		

(1) Record of flow in Colusa Trough is only available for the period May 1 to December 31, inclusive (Table 88).

TABLE 82

RELATION BETWEEN DIVERSIONS FROM AND RETURN TO THE SACRAMENTO RIVER FROM RECLAMATION DISTRICT #70 FOR 1941

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.-Dec. inc.	Mar.-Oct. inc.	Jul.-Sep. inc.	Acreage Irrigated	
	Acre-feet															Gen.	Rice
Diversions (1)	0	0	0	180	2660	3870	7350	6840	3780	20	0	0	24700	24700	17970	6000	1280
Return water (2)	5350	5030	5480	5500	1820	1450	810	1450	1200	480	360	1180	30110	18190	3460		
Return in % of diversion	--	--	--	--	68	37	11	21	32	--	--	--	--	--	19		
Return in % of annual diversions	--	--	--	--	7.4	5.9	3.3	5.9	4.9	1.9	1.5	--	--	--	14		
Drainage rediverted (3)	0	0	0	0	740	580	1300	710	0	0	0	0	3330	3330	2010		
Rainfall (4)																	

(1) The diversions comprise those from the Sacramento River, left bank, Mile 67.5 to Mile 83.5 (Table 62) and those from Butte Slough, Mile 0.3W to 7.5W (Table 65).
(2) The return water is the discharge to the Sacramento River through the drainage plant of Reclamation District 70 at Mile 68.8L (Table 95). This is a combined drainage and irrigation plant which also discharges into an irrigation canal at the plant.
(3) This is the water re-used within the district. It has not been taken into account in the percentage computations.
(4) Rainfall not taken into account in percentage figures. See Tables 111 to 122 for daily rainfall records.

TABLE 83

RELATION BETWEEN DIVERSIONS FROM AND RETURN TO THE SACRAMENTO RIVER FROM RECLAMATION DISTRICT #108 FOR 1941

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.-Dec. inc.	Mar.-Oct. inc.	Jul.-Sep. inc.	Acreage Irrigated	
	Acre-feet															Gen.	Rice
Diversions (1)	0	0	0	420	24300	21200	29700	29700	13300	240	0	0	117260	117260	71100	3390	14030
Return water (2)	17900	17500	17700	13600	5280	9190	7360	10200	11300	3670	1500	6930	122210	78300	28860		
Return in % of diversion	--	--	--	--	22	43	26	34	85	--	--	--	--	--	41		
Return in % of annual diversions	--	--	--	--	4.5	7.8	6.3	8.7	9.6	3.1	1.3	--	--	--	25		
Drainage rediverted (3)																	
Rainfall (4)																	

NOTE: Flood stages prevailed in spring and winter.
(1) The diversions comprise those from the Sacramento River, right bank, from Mile 43.1 to Mile 63.2 (Table 62).
(2) The return water is the discharge to Sacramento River of Reclamation District 108 drain at Rough and Ready Bend (Table 96) and on Back Borrow Pit (Table 97).
(3) No report of any rediversion of drainage water.
(4) Rainfall not taken into account in percentage figures. See Tables 111 to 122 for daily rainfall records.

TABLE 84

RELATION BETWEEN DIVERSIONS FROM AND RETURN TO THE SACRAMENTO RIVER FROM RECLAMATION DISTRICT #1500 FOR 1941

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.-Dec. inc.	Mar.-Oct. inc.	Jul.-Sep. inc.	Acreage Irrigated	
	Acre-feet															Gen.	Rice
Diversions (1)	0:	0:	0:	2400:	40100:	50300:	56700:	52200:	38400:	300:	0:	0:	240400:	240400:	147300:	26800:	18100:
Return water (2)	33000:	26100:	25900:	18700:	22600:	27600:	26700:	27900:	31200:	6000:	4000:	10700:	260400:	186600:	85800:		
Return in % of diversion	-:	-:	-:	-:	56:	55:	47:	53:	81:	-:	-:	-:	-:	-:	58:		
Return in % of annual "	-:	-:	-:	-:	9.4:	11.5:	11.1:	11.6:	13.0:	2.5:	1.7:	-:	-:	-:	36:		
Drainage rediverted (3)	0:	0:	0:	0:	90:	0:	0:	0:	0:	0:	0:	0:	90:	90:	0:		
Rainfall (4)																	

(1) The diversions comprise those from the Sacramento River, left bank, from Mile 29.9 to Mile 63.75 (Table 62). The principal ones are the Sutter Mutual Water Company's plants at Tisdale, State Ranch Bend and Portugese Bend. Diversions through Tisdale plant to R.D.1660 have been excluded.
(2) The return water is the discharge through the drainage plant of Reclamation District 1500 on the West Borrow Pit of the Sutter By-Pass (Table 102). This water reaches Sacramento River via Sacramento Slough (Table 100).
(3) This is the water pumped from drains and re-used within district. It has not been taken into account in the percentage computations.
(4) Rainfall not taken into account in percentage figures. See Tables 111 to 122 for daily rainfall records.

TABLE 85

RELATION BETWEEN DIVERSIONS FROM AND RETURN TO THE SACRAMENTO RIVER FROM RECLAMATION DISTRICT #1000 FOR 1941

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.-Dec. inc.	Mar.-Oct. inc.	Jul.-Sep. inc.	Acreage Irrigated	
	Acre-feet															Gen.	Rice
Diversions (1)	0:	0:	0:	240:	5080:	7880:	9560:	10200:	5960:	100:	0:	0:	39900:	39900:	25720:	4960:	3130:
Return Water (2)	22900:	20300:	15000:	14900:	4320:	780:	120:	400:	2620:	1110:	650:	2480:	-:	-:	3140:		
Return in % of diversion	-:	-:	-:	-:	-:	9.9:	1.2:	3.9:	44.0:	-:	-:	-:	-:	-:	12:		
Return in % of annual diversion	-:	-:	-:	-:	10.8:	2.0:	0.3:	1.0:	6.6:	2.8:	1.6:	-:	-:	-:	8:		
Drainage rediverted (3)														3960:			
Rainfall (4)																	

(1) The diversions comprise those from the Sacramento River, left bank, Mile 2.4 to Mile 19.6 (Table 62)
(2) The return water is the discharge through the drainage plant of Reclamation District #1000, Plant #3 (Table 109) and 2nd Bannon Slough (Table 110).
(3) This is the water pumped from the drains within the district and at Central M. W. Co. plant (Mile 16.0L).
(4) Rainfall is not taken into account in percentage figures. See Tables 111 to 122 for daily rainfall records.

TABLE 86

RETURN FLOW IN SAN JOAQUIN VALLEY STREAMS - 1941

(Acre-feet)

River Section	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
					SAN JOAQUIN RIVER							
Fremont Ford Bridge to Vernalis												
Fremont Ford Bridge to Newman	-4400	3300	10300	-17900	-44100	-38100	7600	5020	-1150	-2200	-4400	89000
Newman to Grayson	25900	11800	74000	61800	25100	41200	57500	34100	24500	27300	15300	8800
Grayson to Hetch Hetchy Crossing	-4800	-23100	-20100	-15500	-31400	28600	22700	9700	5300	6200	5500	1300
Hetch Hetchy Crossing to Vernalis	-1800	-4800	35300	34200	-12700	-45500	17800	-3800	-7900	-300	-2000	-1200
Total return flow*	14900	-12800	99500	62600	-63100	13800	105600	45020	20750	31000	14400	98700
Total diversions	0	0	0	300	13600	15500	26500	20800	12700	3950	0	0
					STANISLAUS RIVER							
Orange Blossom Bridge to Hatmark Ranch												
Orange Blossom Bridge to Riverbank	10400	9100	7000	1000	-4700	11500	8800	4900	4500	4400	2600	8300
Riverbank to Ripon Bridge	100	-2300	-1600	12000	-1700	19200	14100	8500	8300	10200	16800	700
Ripon Bridge to Bret Harte Pump	300	300	-7700	-10500	-25200	8100	3200	7000	4800	3300	-300	0
Total return flow**	10800	7100	-2300	3300	-31600	38800	26100	20400	17600	17900	19300	9000
Total diversions	0	0	10	400	2700	3200	3400	3200	2500	1300	0	0
					TUOLUMNE RIVER							
La Grange Bridge to Tuolumne City												
La Grange Bridge to Roberts Ferry Bridge	10500	14100	25700	16900	36000	48100	8000	2800	2200	3000	200	3300
Roberts Ferry Bridge to Hickman Bridge	3400	-5000	-6000	1300	-20000	-16400	2100	2600	3100	6400	10800	8200
Hickman Bridge to Modesto	9100	12100	9900	12700	2500	4200	26500	18600	13200	12900	5800	8800
Modesto to Tuolumne City	8800	6800	10600	11100	7500	7000	4300	4600	5300	5900	6800	-3200
Total return flow**	31800	28000	40200	42000	26000	42900	40900	28600	23800	28200	23600	17100
Total diversions	0	0	0	100	500	700	600	600	400	200	0	0
					MERCED RIVER							
Yosemite Valley Railroad to Mouth												
Yosemite Valley Railroad to Livingston	5600	9300	15800	4500	17100	16700	16700	12400	10000	10600	7900	8800
Livingston to mouth	600	1000	-6500	800	-2700	-8100	800	5200	5900	4100	3000	1400
Total return flow**	6200	10300	9300	5300	14400	8600	17500	17600	15900	14700	10900	9400
Total diversions	0	0	0	0	900	1600	2000	1500	1300	200	0	0

*The return flow figure is obtained by making due allowance for diversions and deducting all measured inflow from tributaries, but it is apparent that there is a large unmeasurable accretion from lands irrigated from the tributaries. Inflow of Dry Creek treated as Tuolumne River return water. During periods of high flow a large portion of the water passing Fremont Ford bridge is in the Mud Slough channels and spreads over a large area.

**The excessive return flow in relation to diversions here shown is due to large irrigation district diversions which are made above upper station shown for each stream. This return flow enters the channels below the initial gaging stations on each.

TABLE 87

COMPARISON OF DIVERSIONS AND RETURN FLOW - SAN JOAQUIN VALLEY 1941
(Quantities in acre-feet except as noted)

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.-Dec.
San Joaquin River near Friant (1)	121100	197900	212500	228000	560000	561600	317500	110200	77250	59520	48590	110800	2605760
DIVERSIONS													
Miller & Lux	4480	9920	13200	30300	143900	160100	157400	117600	81900	63900	36900	14400	834000
Merced Irrigation District	600	500	2600	17400	74200	86000	91500	74250	54820	22870	1160	700	426870
Turlock Irrigation District Canal (1)	2360	4700	8660	39250	98040	90200	86780	59360	58450	40110	10880	4860	511740
Modesto Irrigation District Canal (1)	1570	15970	6050	18970	63910	73350	54150	33510	35790	33690	11450	0	348410
So. San Joaquin & Oakdale I.D. Canal (1)	60	15520	6670	15650	56730	58790	58720	49180	30290	7690	10160	100	309560
Oakdale Irrigation District Canal (1)	0	0	0	6200	22730	22200	22770	22100	14630	4020	0	0	114730
Pumping Diversions-Tables 73,74,75,76	0	0	10	820	17700	21000	32500	26200	16900	5640	0	0	120770
Total diversions - acre-feet	9070	46610	37190	128590	477210	519720	503820	382470	292870	177920	70550	20060	2666080
Total diversions- average c.f.s.	148	839	605	2161	7761	8734	8194	6220	4922	2894	1186	326	3683
Monthly diversion in % of seasonal	0.3	1.7	1.4	4.8	17.9	19.6	18.9	14.3	11.0	6.7	2.6	0.8	
RETURN FLOW (3)													
San Joaquin River near Vernalis (1)	438600	727900	1302000	1017000	1309000	1327000	562100	128800	100300	135200	138600	293700	7480200
Pumping diversions-Tables 73,74,75,76	0	0	10	820	17700	21000	32500	26200	16900	5640	0	0	120700
Undiverted Flow (2)													
at Fremont Ford Br. (San Joaquin R.)	251100	444800	586000	399800	447100	502100	286100	20800	14500	12300	16800	105100	3166500
at LaGrange (Tuolumne River)	56500	104900	230300	182800	293000	347300	67900	18700	21700	34300	44700	90500	1492600
at Yosemite Val. R.R. Crossing (Merced River)	25700	80500	164000	161000	273000	205000	36300	2500	1600	1200	660	2020	953560
at Orange Blossom Br. (Stanislaus R.)	41600	65100	175000	161000	368000	137000	14100	1600	1200	1000	8180	44300	1018080
Power release and spill (2)													
Net return - acre-feet (3)	63700	32600	146710	113220	-544	76600	198200	111400	70200	91960	68260	51780	970230
Net return - average c.f.s. (3)	1036	587	2386	1903	-885	1287	3093	1812	1314	1496	1147	842	1340
Return in % of diversions	--	--	--	--	--	15	38	29	27	52	--	--	
Monthly return in % of seasonal	--	--	--	--	--	7.9	19.6	11.5	8.1	9.5	7.0	5.3	

NOTE: Only the major diversions from the San Joaquin River between Friant and Fremont Ford Bridge are included in figures. It is possible that some of the late summer flow at Fremont Ford Bridge considered in this table as being "Undiverted flow" is actually return water. For the periodic relation between diversion and return flow see Table 77.

(1) U.S.G.S. station.
(2) It is assumed that the stations which are above the valley diversions and below the foothill diversions represent all undiverted flow and include all spill or power release.
(3) Includes any valley floor run-off and all accretions.

TABLE 88

DISCHARGE OF COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1					*680	842	643	629	721	609	205	215
2					650	847	612	618	725	511	301	398
3					620	902	605	605	710	459	293	502
4					590	895	603	605	694	452	312	438
5					550	931	605	609	678	442	285	359
6					510	912	602	618	678	436	290	304
7					480	864	587	620	674	428	215	254
8					453	818	581	645	641	424	227	227
9					474	771	581	651	602	419	232	197
10					574	698	565	643	612	419	178	188
11					442	686	559	651	654	379	127	190
12					415	676	552	670	704	338	120	199
13					525	666	552	694	729	298	115	207
14					612	656	525	721	740	259	131	395
15					621	645	536	744	757	219	138	703
16					502	634	550	733	768	210	147	882
17					501	625	565	712	782	202	151	1070
18				13000	521	616	563	738	789	210	158	1060
19					572	629	550	740	807	219	147	816
20					594	641	550	716	816	227	136	583
21					566	654	545	706	816	214	124	504
22					532	668	563	727	780	205	113	453
23					538	682	557	723	746	199	108	401
24					543	698	536	731	782	199	108	374
25					552	712	539	755	809	254	99	361
26			430		587	757	543	744	816	227	113	393
27					618	744	557	716	800	295	120	480
28					672	727	581	721	744	430	131	1090
29					712	723	605	721	698	379	156	1690
30					723	690	609	716	630	354	213	2280
31					798		625	712		288		2670
Mean					572	734	572	688	731	329	176	641
Ac.Ft. for Month					35160	43650	35200	42320	43500	20240	10460	39440

*Beginning of record for season. Period May 1 to May 7 interpolated.

NOTE: This is return water flowing in the main drain of Reclamation District 2047; it is drainage chiefly from lands irrigated by Glenn-Colusa, Provident, Princeton-Codora-Glenn, Compton-Delevan and Maxwell Irrigation Districts. Flow reaches Sacramento River via Back Borrow Pit (Table 98).

TABLE 89

DISCHARGE OF BUTTE SLOUGH TO SACRAMENTO RIVER - 1941

Day	Monthly Discharge in Second-feet											
	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		0	0	0		0	0	47	356	280	490	0
2			0					75	356	280	490	385
3			910					183	356	140	588	0
4			1020					171	350	140	280	0
5			868				0	227	357	140	588	0
6			826	0			79	150	366	140	637	0
7			637	868		0	70	142	339	140	693	945
8			0	826		140	42	190	339	385	637	1080
9				693		140	59	179	339	280	637	1200
10				0		140	44	162	330	280	490	1170
11						280	44	178	327	140	385	1050
12		0				140	44	180	324	140	385	910
13		1020				140	42	170	305	140	385	637
14		1050				280	22	184	299	140	490	784
15		868				280	0	233	303	140	385	0
16		490				280		183	262	140	280	
17		0				140		201	324	140	385	
18						280		189	134	140	385	
19						128		208	130	140	385	
20						118		216	130	140	280	
21						67		204	130	140	280	
22						2		227	65	140	280	
23						0		299	130	280	385	
24								274	130	280	280	
25								286	130	140	280	
26								269	300	140	280	
27								279	385	385	385	
28		0					0	287	385	588	490	
29							63	327	490	637	490	
30		-		0		0	76	306	280	637	140	
31		.	0	.	.		54	322		490		0
Mean	0	122	137	80	0	85	21	211	282	241	419	263
Ac. Ft. for Month	0	6800	8450	4730	0	5070	1270	12990	16760	14800	24920	16190

NOTE: This is the discharge to the Sacramento River at Mile 84 Left and is measured at and regulated by the gravity culverts at the mouth of the Slough. This flow together with that shown in Tables 90 and 93 is made up almost entirely of return water from lands irrigated by Feather River diversions during the summer months. Discharge from the Sacramento River over Moulton and Colusa weirs is shown in Tables 91 and 92, respectively.

TABLE 90

DISCHARGE OF BUTTE SLOUGH TO SUTTER BY-PASS - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	42300	26800	38700	6000	940	420	137	167				0
2	25200	18000	73500	28500	900	440	151	120				152
3	15900	12800	97400	43200	900	460	151	112				308
4	11400	9600	98700	45900	900	460	167	90				1070
5	8400	7000	92600	56100	940	444	223	83				1750
6	6600	5050	84300	78900	940	400	215	71				2240
7	6800	4200	70700	87200	940	380	183	83				1820
8	18000	5050	56100	74400	940	328	199	83				1120
9	30300	9000	43200	58800	940	301	199	83				700
10	33900	19800	30300	45000	940	265	199	83				460
11	26800	43200	21000	40500	900	231	199	90				288
12	18600	80700	15900	33900	860	207	191	83				193
13	12800	105200	12400	26800	860	199	183	83	FLOW	FLOW	FLOW	138
14	10800	97400	9900	19800	860	207	183	97				160
15	19200	80700	7600	15400	860	207	183	97				580
16	41400	65200	5800	12000	860	199	183	77				2400
17	44100	52300	4500	9600	860	175	183	90	NO	NO	NO	15100
18	37700	41400	3500	7400	860	144	175	83				32100
19	27600	33900	2800	5650	860	116	175	90				41400
20	23000	31200	2400	4300	820	116	167	83				44100
21	28500	25200	2100	3230	790	137	167	83				44100
22	33900	19800	1820	2560	700	151	159	83				39600
23	42300	16900	1620	2170	580	159	167	65				29400
24	48600	15900	1440	1750	500	144	159	49				19800
25	57000	16900	1320	1500	440	144	159	59				14600
26	66100	20400	1170	1270	400	144	175	54				10500
27	70700	19200	1120	1170	380	151	175	45				7800
28	76200	19200	1020	1070	380	167	183	36				6600
29	69800		980	1020	380	159	199	0				6600
30	56100		980	980	380	137	175	0				14100
31	41400		1070		400		159	0				18000
Mean	33916	32214	25353	23869	749	240	178	75	0	0	0	11522
Ac.Ft. for Month	2085000	1789000	1559000	1420000	46040	14270	10950	4610	0	0	0	708500

NOTE: This is the discharge from Butte Slough to the Sutter By-Pass. During low flow periods gates at mouth of slough are regulated (Table 89) which forces water under Long Bridge as shown in this table. Normal and summer flows are primarily from Feather River sources. During flood periods Sacramento River water enters Butte Basin above Butte City by bank spill and over Moulton and Colusa weirs. The purpose of the summer regulation is to make water available for use on Sutter By-Pass lands (below Long Bridge).

TABLE 91

DISCHARGE OF MOULTON WEIR TO BUTTE BASIN - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0	0	1380	6100								0
2			22300	9300								
3			19800	6100								
4			16000	6100								
5			15000	15500								
6	0		9300	18700								
7	430		3030	10700								
8	3960	0	330	3030								
9	3030	810	0	150								
10	420	7300		27								
11	0	15500		465								
12		23500		150								
13	0	18700		0								
14	6	11700			FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	
15	6900	4920										0
16	5300	630										230
17	630	2			NO	NO	NO	NO	NO	NO	NO	4920
18	0	0										8100
19	0	240										3640
20	690	3										4590
21	3640	0										2180
22	4260											90
23	6500											0
24	9300	0										
25	12700	5										
26	11700	0										
27	15500	0										
28	11700	1360										0
29	3330											30
30	35		0									240
31	0		8	0								0
Mean	3227	3024	2811	2544	0	0	0	0	0	0	0	775
Ac. Ft. for Month	198400	167900	172900	151400	0	0	0	0	0	0	0	47640

NOTE: Discharges based upon measurements made and curves developed by Corps of Engineers, U. S. Army.
Elevation of crest is 76.75 U.S.E.D. datum; length of crest is 500 feet.

TABLE 92

DISCHARGE OF COLUSA WEIR TO BUTTE BASIN - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	7500	7500	60000	49000	0							0
2	1500	4000	67000	63500								0
3	4	2500	59000	55000								0
4	0	350	55000	50000								2000
5	0	0	53000	51000	0							460
6	320	0	51000	66000	38							0
7	11300	800	44000	53000	500							
8	39000	9000	33000	45000	14							
9	35000	27500	22500	33000	0							
10	26000	49000	15500	27500								
11	10000	60500	10000	33000								
12	3000	65000	7500	31500								
13	300	49000	4500	19500								
14	6500	48000	3000	11500								
15	45000	43000	1700	6500		NO FLOW	NO FLOW	NO FLOW	NO FLOW	NO FLOW	NO FLOW	0
16	45000	39000	500	5000								580
17	33000	29500	18	3500								19500
18	19500	24000	0	1700								49000
19	9000	29500		500								57000
20	19500	26000		9								47000
21	39000	14000		0								49000
22	39000	10000										45000
23	47000	12500										29500
24	48000	12500										10000
25	54000	24000										6000
26	52000	22500										1700
27	56000	14000										7
28	56000	31500										0
29	43000											0
30	27000		0	0								10000
31	15500		850	0	0							31500
												12500
Mean	25420	23680	15740	20520	18	0	0	0	0	0	0	11960
Ac.Ft. for Month	1563000	1315000	968100	1221000	1100	0	0	0	0	0	0	735400

NOTE: Discharges based upon measurements made and curves developed by Corps of Engineers, U. S. Army. Elevation of crest is 61.80 U.S.E.D. datum; length of crest 1650 feet.

TABLE 93

DISCHARGE OF WADSWORTH CANAL TO SUTTER BY-PASS - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	330	197	1020	122	80	122	72	90	119	106	36	47
2	208	163	752	132	80	112	72	90	119	106	41	47
3	197	163	597	208	80	103	72	90	135	96	46	56
4	219	132	752	381	80	103	72	80	135	106	50	56
5	174	132	597	966	103	87	72	90	106	106	50	51
6	256	132	473	556	103	80	72	100	119	106	56	47
7	292	122	219	407	112	73	72	100	119	106	56	47
8	243	268	95	381	87	80	80	90	119	106	107	47
9	185	653	56	103	87	73	80	90	106	106	58	43
10	219	1070	43	67	95	73	80	90	119	106	170	43
11	231	923	100	56	80	67	72	90	119	106	53	43
12	163	766	197	31	112	67	72	100	119	106	73	43
13	528	681	174	100	153	61	72	100	119	96	67	43
14	823	583	174	174	143	67	72	100	112	85	47	95
15	809	200	153	163	122	67	72	100	112	85	47	122
16	695	381	153	153	103	61	80	100	100	77	47	143
17	407	231	143	143	95	61	100	100	100	77	47	132
18	174	256	132	132	103	61	80	114	100	77	47	132
19	433	132	132	112	103	56	72	114	112	96	47	65
20	542	112	132	112	95	56	80	100	112	119	47	0
21	528	153	122	103	87	56	72	100	128	119	47	0
22	489	243	112	103	87	56	72	114	128	106	47	0
23	342	153	112	95	87	44	72	114	128	96	47	40
24	447	489	103	87	103	40	65	100	145	85	47	80
25	447	447	103	87	112	40	72	110	128	96	47	87
26	695	243	95	87	112	40	80	119	119	96	47	95
27	752	473	95	87	112	48	80	119	106	119	47	208
28	305	752	95	87	103	40	90	119	85	106	47	394
29	174		87	87	122	40	90	135	85	77	47	501
30	87		87	87	122	60	80	155	106	69	47	317
31	35		112		122		80	135		62		256
Mean	369	366	233	180	103	66	76	105	115	97	55	106
Ac.Ft. for Month	22670	20330	14310	10730	6320	3960	4700	6440	6860	5960	3300	6510

NOTE: This is the discharge (measured at Weir #4) to the East Borrow Pit of the Sutter By-Pass at Mile 16.0 (north from Chandler). This flow is made up entirely of Feather River drainage or return flows. This flow and the flow from Butte Slough (Table 90) make up the entire Feather River contribution to the Sutter By-Pass. See footnote Table 90.

TABLE 94

DISCHARGE OF TISDALE WEIR TO SUTTER BY-PASS - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	14000	13600	21000	15900	2800							0
2	12700	12700	24500	20000	3400							
3	9700	11800	38000	20000	2300							
4	5500	10800	41000	20000	3400							
5	4100	7900	38000	21000	5500							
6	7000	6300	30000	26000	7000							
7	12700	8800	22000	28500	8800							
8	18200	12700	20000	22000	8800							
9	18200	15900	17000	18200	6300							
10	18200	18200	10800	17000	5500							
11	15900	22000	14800	17000	4100							
12	13600	28500	13600	17000	2800							
13	11800	46000	12700	15900	3400							
14	11800	43000	11800	14800	4100	NO FLOW	NO FLOW	NO FLOW	NO FLOW	NO FLOW	NO FLOW	0
15	18200	27000	10800	13600	4600							580
16	20000	21000	9700	12700	3400							14800
17	20000	18200	8800	11800	1300							18200
18	17000	17000	7000	11800	300							21000
19	14800	17000	6300	9700	8							21000
20	14800	17000	5500	8800	0							21000
21	18200	15900	4100	7000								20000
22	18200	14800	3400	4600								18200
23	20000	14800	2300	4100								14800
24	21000	14800	910	3400								14800
25	22000	15900	200	2800								13600
26	22000	17000	0	2300								11800
27	23500	15900	0	2300								8800
28	24500	15900	0	2300								6300
29	22000		0	1780								13600
30	18200		90	910								17000
31	15900		7900		0							15900
Mean	16270	17070	12330	12440	2510	0	0	0	0	0	0	8109
Ac.Ft. for Month	1001000	992500	758100	740200	154300	0	0	0	0	0	0	498600

NOTE: Discharge based upon measurements made and curves developed by Corps of Engineers, U. S. Army.
Elevation of crest is 45.45 U.S.E.D. datum; length of crest is 1155 feet.

TABLE 95

DISCHARGE OF RECLAMATION DISTRICT 70 DRAIN - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	48	31	102	107	61	57	4	38	0	19	18	10
2	22	47	102	113	61	19	6	35		7	21	10
3	22	62	102	112	57	23	6	32		7	18	13
4	40	63	102	113	45	59	6	21		7	10	17
5	42	53	102	119	41	79	6	19		7	0	10
6	45	54	102	117	41	0	6	26		10	0	7
7	80	44	102	118	0	60	6	26		10	10	10
8	104	62	102	118	28	20	2	33		10	19	10
9	105	83	102	119	29	59	2	39		10	25	10
10	104	93	102	120	7	19	2	26		7	25	10
11	80	94	103	119	11	56	2	33		7	17	7
12	47	94	103	119	12	23	2	31		10	18	8
13	51	94	103	120	10	19	2	24	0	10	0	6
14	104	94	103	118	51	56	9	20	29	10		5
15	108	99	107	118	40	0	20	20	32	10		6
16	111	109	116	113	15	37	23	23	63	7		19
17	115	113	121	113	51	13	27	23	62	7		17
18	115	113	121	112	51	14	24	19	61	7		15
19	115	113	121	107	46	15	15	16	40	7		15
20	115	113	121	78	51	16	18	11	39	7		15
21	115	113	121	83	54	15	21	33	38	8		15
22	115	113	121	22	33	20	15	26	40	7		19
23	115	113	75	63	15	18	31	31	32	7		18
24	115	114	35	46	16	5	29	31	29	0		16
25	115	114	28	45	15	4	22	31	29	0		18
26	115	114	40	46	15	4	15	19	26	7		19
27	115	114	40	45	54	7	15	12	26	0	0	28
28	115	114	40	46	8	5	25	33	21	0	2	39
29	98		40	55	0	4	15	0	20	20	1	68
30	67		39	48	0	4	15	0	19	14	0	67
31	39		46		0		19	0		13		66
Mean	87	91	89	92	30	24	13	24	20	8	6	19
Ac.Ft. for Month	5350	5030	5480	5500	1820	1450	813	1450	1200	484	365	1180

NOTE: This is the drainage from Reclamation District 70 returned to the Sacramento River at Mile 68.8 Left. Discharge to Sacramento River both by pumping and controlled gravity flow. This is a combination irrigation and drainage plant and discharges both to the Sacramento River and to an irrigation canal.

TABLE 96

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN AT ROUGH AND READY BEND - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	142	567	135	90	0	161	136	252	32	0	0
2	137	141	751	148	0	190	158	83	210	195	115	0
3	85	102	550	144	0	181	158	201	164	148	0	116
4	120	104	552	404	102	186	143	187	165	144	0	0
5	204	101	553	551	89	197	193	133	212	230	0	0
6	252	122	563	731	92	180	0	141	62	0	137	0
7	307	135	559	532	0	138	139	141	255	46	0	148
8	422	190	570	434	93	203	135	141	172	0	0	0
9	328	459	754	396	0	193	125	85	119	38	134	
10	212	537	549	361	0	161	121	166	178	40	0	
11	178	549	538	479	114	161	117	190	175	40		
12	135	715	419	465	93	145	156	141	173	40		0
13	219	518	246	319	93	159	0	146	71	40		120
14	532	457	145	210	92	210	114	189	270	42	0	224
15	528	343	146	226	92	0	84	193	244	46	112	0
16	478	420	146	157	93	160	102	86	237	44	0	140
17	366	382	146	132	154	157	109	203	227	37		136
18	238	347	123	105		162	107	197	218	37		134
19	207	284	91	97	141	158	59	231	221	35		88
20	358	214	110	94	145	155	170	186	252	30		0
21	404	254	105	92	98	277	115	181	282	32		124
22	428	286	83	92	100	0	118	183	152	35	0	0
23	406	266	83	92	99	159	120	82	172	35	146	128
24	424	255	85	86	103	194	121	271	183	40	0	89
25	346	288	47	44	0	163	123	226	193	24		71
26	378	288	25	99	100	159	74	170	158	151		0
27	324	389	107	0	100	162	157	175	191	0		155
28	226	553	73	94	97	263	130	173	246	0		481
29	163		0	72	102	0	131	178	126	150	0	474
30	151		116	47	156	161	137	71	133	0	154	504
31	129		130		223		133	265		120		372
Mean	290	316	288	228	86	154	120	166	190	60	27	113
Ac.Ft. for Month	17860	17540	17720	13560	5280	9190	7360	10220	11330	3670	1580	6930

NOTE: This is the drainage from Reclamation District 108 discharged to the Sacramento River at Mile 44.0 Right. Discharge through siphon and by pumping. Additional drainage from Reclamation District 108 is sometimes discharged to Back Barrow Pit at Mile 20.2 Left. See Table 97.

TABLE 97

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN ON BACK BORROW PIT - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15					NO DRAINAGE							
16												
17					GATE CLOSED ALL YEAR							
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean												
Ac.Ft. for Month												

NOTE: This drain at Mile 20.2L supplements the main drainage plant of Reclamation District 108 on Sacramento River at Rough and Ready Bend (see Table 96).

TABLE 98

DISCHARGE OF COLUSA BASIN DRAINAGE TO SACRAMENTO RIVER AT KNIGHTS LANDING - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1						0	611	379	696	738	450	146
2							510	379	696	682	450	0
3							461	335	696	527	450	
4							575	379	620	707	395	
5						0	616	379	620	715	395	
6						365	552	379	620	511	395	
7						348	500	430	620	450	342	
8						341	500	379	547	395	291	
9						615	454	430	484	342	291	
10						577	454	430	430	342	291	
11						750	454	430	430	342	246	
12						870	454	484	547	291	203	
13	FLOW	FLOW	FLOW	FLOW	FLOW	676	414	484	612	291	128	
14						845	414	547	692	291	128	
15						820	414	547	678	291	128	
16						695	207	620	678	291	128	
17	NO	NO	NO	NO	NO	430	162	620	740	246	128	
18						547	191	620	692	246	128	
19						620	402	620	461	246	128	
20						547	500	620	461	291	128	
21						620	414	620	461	291	128	
22						620	414	620	461	291	164	
23						620	414	620	888	291	128	
24						620	414	620	1130	246	93	
25						620	279	696	1070	246	93	
26						692	162	696	1070	291	93	
27						692	228	696	1130	342	64	
28						692	262	696	1070	450	93	
29						692	335	696	992	570	93	
30						620	335	696	936	570	164	
31							379	696		570		0
Mean	0	0	0	0	0	518	403	543	708	400	211	5
Ac.Ft. for Month	0	0	0	0	0	30810	24760	33410	42110	24580	12570	290

NOTE: This is the drainage from Colusa Basin passing down the Back Borrow Pit of Reclamation Districts 108 and 787 and entering the Sacramento River at Mile 34.15 Right, just above the Knights Landing gaging station. It does not include any drainage from Reclamation District 787 entering the Back Borrow Pit via Sycamore Slough outlet (See Table 99 for Sycamore Slough contribution). Irregularities in the flow are due to checking operations at the Knights Landing outfall gates whereby a portion of the flow of the Back Borrow Pit is diverted to the Knights Landing Ridge Cut. This diversion is shown in Table 105. Total flow to Sacramento River is sum of Tables 98 and 99.

TABLE 99

DISCHARGE OF SYCAMORE SLOUGH TO FLOW OF COLUSA BASIN DRAINAGE - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1						0	3	14	8	12	1	
2							3	14	8	12	1	
3							2	14	6	11	1	
4							2	14	6	8	1	
5							2	14	6	5	1	
6							2	14	6	4	1	
7							2	12	5	3	1	
8							2	12	5	3	1	
9							2	11	5	2	1	
10							2	11	5	2	1	
11	OUTFLOW	OUTFLOW	OUTFLOW	OUTFLOW	OUTFLOW		2	9	5	2	1	OUTFLOW
12							2	8	5	2	1	
13							2	8	5	2	1	
14							2	6	5	2	1	
15							3	6	5	1	0	
16	NO	NO	NO	NO	NO		3	8	5	1		NO
17							3	11	5	1		
18							3	12	5	1		
19							3	14	5	1		
20							4	15	5	1		
21							4	15	5	1		
22							5	16	6	1		
23						0	5	15	6	1		
24						4	6	15	8	1		
25						4	8	14	9	1		
26						3	9	12	9	1		
27						3	11	12	11	1		
28						3	12	11	11	1		
29						3	12	11	12	1		
30						3	12	9	12	1		
31							14	8		1	0	
Mean	0	0	0	0	0	0.77	5	12	7	3	0.47	0
Ac.Ft. for Month	0	0	0	0	0	46	292	724	395	173	28	0

NOTE: This water is discharged below outfall gates and is not included in the flow shown in Table 98.

TABLE 100

DISCHARGE OF SACRAMENTO SLOUGH TO SACRAMENTO RIVER (ABOVE VERONA) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1							590	720	820	510	280	350
2							550	550	590	600	480	590
3							470	590	450	510	320	**220
4							520	570	730	680	320	
5							450	590	720	470	280	
6							430	610	720	420	320	
7							450	530	910	400	320	
8							400	530	700	280	280	
9							160	530	720	360	220	
10							450	560	580	330	220	
11							450	650	670	330	280	
12	RECORD	RECORD	RECORD	RECORD	RECORD		510	560	620	370	250	
13							710	600	580	340	250	
14							470	620	880	330	250	
15							540	650	650	340	250	
16						*1000	540	600	600	300	430	
17	NO	NO	NO	NO	NO	710	580	800	540	300	280	
18						520	580	560	590	300	240	
19						450	580	600	600	270	230	
20						350	770	600	510	280	270	
21						400	480	610	750	260	230	
22						500	610	630	670	260	280	
23						310	570	640	620	260	280	
24						390	630	770	710	240	250	
25						460	640	590	740	300	310	
26						450	620	620	680	300	290	
27						450	770	630	680	390	290	
28						520	460	630	680	340	290	
29						500	590	630	530	290	250	
30						450	640	620	560	280	490	
31							680	900		280		
Mean							545	622	660	352	291	
Ac.Ft. for Month							33500	38300	39300	21700	17300	

* Beginning of record for season following high water period.

** End of seasons record. High water period follows.

NOTE: This is the discharge to the Sacramento River via Sacramento Slough at Mile 21.2L. Discharge in this table from measurements made in slough and rating curve developed. This is the entire outflow of the Sutter By-Pass area and R.D. #1500. In former years flow of Sacramento Slough determined by combining outflow of R.D.#1500 with Sutter By-Pass flows. During high water periods the slough is entirely submerged as it lies within the By-Pass area. An annual record of the flow of Sutter By-Pass is obtained. See Tables 90,93,94 & 102 which when combined will give the measured flow entering the By-Pass area.

TABLE 101

SACRAMENTO SLOUGH - COMPONENT PARTS OF FLOW - 1941

	From Table No.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
		Acre-feet											
From Feather River via Butte Slough (1)	90						14270	10950	4610	0	0	0	
From Sacramento R. via Moulton Weir	91						0	0	0	0	0	0	
From Sacramento R. via Colusa Weir	92						0	0	0	0	0	0	
From Sacramneto R. via Butte Slough	90						0	0	0	0	0	0	
From Feather R. via Wadsworth Canal (1)	93	NOTE: Due to high water conditions flows not segregated for period January to May incl. or for December.					3960	4700	6440	6860	5960	3300	
From Sacramento R. via Tisdale Weir	94						0	0	0	0	0	0	
From Sacramento R. via R. D. 1500	102						27620	26720	27930	31160	6050	4040	
From Feather River via Sutter By-Pass at Chandler (2)	103						8020	10490	7680	4960	3360	1700	
From Sacramento and Feather Rivers via Sutter By-Pass at R. D. 1500	104						N.R.	N.R.	16200	17400	7180	N.R.	
Sacramento Slough (3)	100						N.R.	33500	38300	39300	21700	17300	
Sacramento River Water (4)								29390	30720	34280	6700	4400	
Feather River Water (4)								4110	7580	5020	15000	12900	
Diversions East Borrow Pit								4830	4650	3740	460	0	
Diversions West Borrow Pit								3830	3140	1100	0	0	
Total Diversions								8660	7790	4840	460	0	

(1) These flows after serving irrigation demands together with any accumulated drainage and a portion of the flow shown in Table 90 is again recorded in Table 103 and Table 104.

(2) This is the measured resultant flow, after satisfying irrigation demands along east borrow pit from Table 93 and a small portion of Table 90.

(3) See footnote Table 100.

(4) 10% added to Reclamation District 1500 measured drainage as an estimate of Sacramento River water entering By-Pass as seepage from Reclamation District 1500.

TABLE 102

DISCHARGE OF RECLAMATION DISTRICT 1500 DRAIN - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	291	283	1178	186	220	347	432	186	618	418	136	0
2	286	281	1169	262	226	367	416	162	450	335	107	0
3	292	296	1075	251	181	381	247	672	540	314	95	98
4	322	295	1075	638	310	429	711	411	538	257	89	37
5	619	265	1080	463	239	435	535	404	577	275	99	20
6	702	306	951	515	178	441	467	421	583	220	61	20
7	867	296	533	461	263	474	366	423	616	153	71	34
8	603	316	453	361	307	676	469	350	485	129	71	20
9	466	564	469	351	295	379	440	173	521	105	66	51
10	438	735	455	490	245	442	455	572	476	102	71	66
11	322	819	412	628	455	434	448	453	490	137	134	45
12	289	965	338	614	325	442	293	495	493	228	0	0
13	539	555	257	471	374	441	696	483	545	0	0	0
14	1119	408	289	289	400	461	396	483	664	79	72	246
15	1108	412	184	306	475	540	441	483	478	65	70	75
16	780	675	273	302	650	350	447	432	553	17	151	13
17	488	494	255	291	602	440	462	644	553	0	0	281
18	458	562	140	278	504	434	446	405	547		0	251
19	455	453	241	205	506	457	298	455	545		0	194
20	522	433	263	157	547	448	721	471	553		186	206
21	758	418	152	283	433	356	369	459	553		0	214
22	759	427	164	207	324	647	414	474	466		0	176
23	597	397	170	137	338	308	416	421	505		188	190
24	612	388	225	154	229	454	416	608	543		0	163
25	510	397	203	173	419	467	413	455	522		0	307
26	555	362	204	177	373	446	288	463	522	0	59	176
27	430	479	193	219	447	448	629	463	505	3	0	268
28	421	858	96	158	444	360	309	480	453	34	34	512
29	388		158	161	346	682	342	495	402	65	50	596
30	338		251	221	363	440	344	404	415	95	147	493
31	315		174		358		348	780		19		621
	539	469	422	314	367	464	435	454	524	98	68	173
Ac.Ft. for Month	33120	26060	25940	18660	22560	27620	26720	27930	31160	6050	4040	10660

NOTE: This is the drainage from Reclamation District 1500 discharged to West Borrow Pit of Sutter By-Pass and thence via Sacramento Slough (in the By-Pass) to Sacramento River. (Table 100)

TABLE 103

DISCHARGE OF SUTTER BY-PASS - EAST BORROW PIT (WILLOW SLOUGH AT CHANDLER) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1						*225	75	191	102	128	43	0
2						225	112	181	102	102	36	0
3						228	102	181	102	93	33	0
4						255	133	143	112	102	33	0
5						269	164	175	112	84	33	**
6						269	186	102	122	62	29	
7						278	207	62	133	50	54	
8						275	218	84	128	75	84	
9						281	218	97	75	97	40	
10						285	164	102	29	79	22	
11						281	97	102	29	70	29	
12						259	143	97	50	66	40	
13						252	196	97	102	62	43	
14						232	207	102	122	54	33	
15						200	196	107	133	50	29	
16						132	164	112	133	43	26	
17						64	181	112	128	40	26	
18						17	202	112	97	22	22	
19						0	202	112	43	26	22	
20							202	112	22	33	26	
21							191	117	40	26	22	
22							181	122	75	36	22	
23							175	122	80	36	22	
24							170	122	80	40	22	
25							164	143	80	22	22	
26							164	143	66	36	22	
27							159	154	43	50	22	
28							159	164	43	40	0	
29						0	170	164	43	22	0	
30						15	191	133	75	22	0	
31							196	107		26		
Mean						135	171	125	83	55	29	
Ac.Ft. for Month						8020	10490	7680	4960	3360	1700	

*Beginning of record for season.

**Recorder removed for winter. For flow in Sutter By-Pass during winter combine Tables 90, 93 & 94.

NOTE: This is return water originating primarily from Feather River diversions and is the net flow of Wadsworth Canal (Table 93) and a portion of the flow from Butte Basin shown in Table 90 after the diversions shown in Table 66 (East Borrow Pit) have been served.

TABLE 104

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT 0.4 MILE ABOVE RECLAMATION DISTRICT 1500 DRAINAGE PLANT - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1												
2								400	200	385	80	
3								410	245	270	200	
4								370	245	230	80	
5								310	325	0	0	
6								370	305	130		
7								330	325	170		
8								195	285	70		
9								175	435	160	0	
10								175	410	185	700	
11								185	220	185	255	
12								205	160	185	0	
13								210	235	150	0	
14								210	295	130	0	
15								245	390	120	170	
16								230	275	65	170	
17							*175	245	385	55	0	
18							210	205	385	55	0	
19							240	210	385	0	**270	
20							240	245	365	60		
21							180	245	340	70		
22							320	245	460	60		
23							425	285	270	60		
24							445	285	480	130		
25							425	205	500	70		
26							425	245	385	80		
27							460	245	270	0		
28							270	285	0	0		
29							285	285	220	140		
30							310	330	0	185		
31							350	330	0	220		
							430	240		0		
Mean								263	293	117		
Ac.Ft. for Month								16200	17400	7180		

*Beginning of record for season.

**End of record for season

NOTE: This is the flow in the West Borrow Pit below the confluence of the East Borrow Pit flow entering via Willow Slough. Due to channel changes discharge record at this station is no longer reliable. This flow is joined by the discharge through R.D.1500 drainage plant and the combined flow is thence discharged via Sacramento Slough (in the By-Pass)to Sacramento River. This is one of the sources formerly measured to obtain the total flow in Sacramento Slough.(See Table 100) Record is readily obtainable only during low flow period. For balance of year when no record is given, see Tables 90, 93 & 94. Their combined flows make up the flow at this point. During extreme stages the Feather River flow at Nicolaus (Table 15) should be added in.

TABLE 105

DISCHARGE OF KNIGHTS LANDING RIDGE CUT AT WEST LINE OF YOLO BY-PASS - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	6500	6390	5360	1000	510	562	104	44	72	20		0
2	5970	5860	6050	1300	615	580	83	44	74	17		0
3	5650	5440	7650	421	632	650	71	44	73	12		1
4	5330	4910	10200	260	580	670	60	44	70	2		40
5	5020	4390	12600	1250	562	650	48	45	68	0		104
6	4600	3760	12600	1430	528	598	44	45	66			246
7	4700	3240	11400	1530	475	475	40	46	68			208
8	4600	3020	10100	2240	440	391	39	46	64			279
9	4180	3130	9110	2880	440	260	38	47	59			111
10	3870	3380	8260	3250	475	159	37	48	56			46
11	4040	2360	7540	4620	422	98	36	49	57			22
12	4490	1710	6810	5050	349	78	35	50	61			6
13	4810	2570	6180	4900	308	68	34	51	62		FLOW	1
14	5330	5310	5760	4760	492	63	34	52	61			3
15	5440	7870	5330	4600	562	54	33	54	61			40
16	5550	8360	4910	4390	545	50	34	57	62			312
17	5650	7950	4500	4190	475	88	44	58	66		NO	810
18	5860	7740	4190	3970	408	105	50	57	61			162
19	5970	7230	3650	3540	388	113	48	57	50			311
20	6180	6700	3240	3240	377	112	38	58	49			510
21	5970	6390	2760	2840	388	114	34	56	50			500
22	5970	6070	2190	2360	370	118	33	55	50			547
23	5970	5650	1620	1830	342	120	33	56	42			374
24	6390	5440	1040	1270	352	118	33	56	32			260
25	6810	5130	585	775	352	124	35	59	32			139
26	7540	4760	366	562	366	124	44	61	32			156
27	8160	4640	282	510	391	130	53	61	32			476
28	8050	4320	222	458	416	130	60	60	31			1000
29	7950		273	398	458	127	69	60	30			2250
30	7440		213	402	492	124	76	61	25			2180
31	6920		550		475		78	60		0		2180
Mean	5836	5133	5017	2341	454	235	48.3	52.9	53.9	1.6	0	431
Ac.Ft. for Month	358800	285100	308500	139300	27900	13990	2970	3250	3210	101	0	26490

NOTE: This is a portion of the Colusa Basin drainage (Table 98) flowing (in the winter) or diverted (in the summer) into the Ridge Cut above the outfall gates on the Back Borrow Pit of Reclamation District 108. Summer diversion is made possible by blocking the gates. Water diverted is available for Yolo By-Pass diverters (Table 66). Station, since 1941, is operated cooperatively by Division of Water Resources and U. S. Geological Survey (Water Resources Branch).

TABLE 106

DISCHARGE OF YOLO BY-PASS* - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	59600	34000	44800	6060	2160	1020	236	61	78	59	52	12
2	36000	26200	82600	10000	2160	1080	217	63	81	65	48	12
3	22400	21200	138000	23600	2160	1140	178	63	86	50	40	15
4	15100	17080	171000	49400	2160	1150	147	68	86	41	35	17
5	11900	12600	156000	76000	2160	1180	129	70	82	44	31	28
6	10600	9500	133000	97400	2020	1150	117	71	79	37	28	73
7	13400	8610	110000	110000	2240	1010	123	71	78	33	26	199
8	21200	7650	79200	97400	2480	842	102	70	76	29	25	360
9	26200	8610	57000	79200	2800	763	88	70	68	28	24	400
10	28900	18000	42600	64800	2560	646	71	70	62	28	24	268
11	28900	54400	32200	49400	2240	475	66	71	59	28	23	125
12	26200	138000	27500	38200	2090	344	63	73	57	30	21	90
13	23600	190000	24900	32200	2480	252	59	75	57	30	18	73
14	22400	171000	21200	27500	3610	208	57	77	55	38	16	67
15	27500	138000	18000	23600	5580	190	55	77	56	48	16	151
16	36000	101000	16000	21200	7940	145	55	73	56	42	15	1930
17	44800	76000	14200	19000	6970	147	57	70	56	37	15	4850
18	36000	57000	10600	16000	3800	153	59	69	59	32	15	28900
19	32200	47000	7940	13400	1810	165	62	65	61	26	14	42600
20	28900	40400	6400	10600	1640	170	63	59	60	21	14	42600
21	28900	36000	5280	8610	1240	165	61	59	69	19	13	40400
22	34000	34000	4590	7180	1110	170	54	66	76	20	13	36000
23	44800	30500	4110	6230	998	170	48	79	70	19	12	28900
24	51800	28900	3610	5130	910	178	47	74	64	18	12	21200
25	62200	27500	3340	4000	880	190	48	72	60	15	12	16000
26	82600	27500	3340	3430	900	190	50	71	58	14	12	10000
27	106000	28900	3340	2800	910	196	53	68	58	15	11	5580
28	119000	32200	3340	2400	900	220	59	72	57	16	11	4220
29	97400		3430	2240	920	220	57	75	57	18	10	9500
30	73000		3610	2240	962	224	56	77	59	28	12	18000
31	51800		4340		998		59	79		50		18000
Mean	42040	50770	39050	30310	2316	472	83.7	70.3	66.0	31.5	20.6	10660
Ac.Ft. for Month	2585000	2820000	2451000	1803000	142400	28070	5150	4320	3930	1940	1230	655700

*: For the period May 20 to December 16 inclusive this station is located at the end of the Sacramento By-Pass and records all flow in Yolo By-Pass, except Putah Creek, to Delta. For period January 1 to May 19 and December 17 to December 31, inclusive, the flow is given at the Woodland-Elkhorn highway crossing. To get total flow through Yolo By-Pass, passing Sacramento, combine the flow in this table with that shown in Table 107 and Putah Creek. The flow in this table includes Cache Creek, Knights Landing Ridge Cut and flow over Fremont weir. To get flow from Sacramento Valley into Delta, combine Tables 12, 106, 107 and Putah Creek flow.

Station since 1941 is operated cooperatively by Division of Water Resources and U.S.Geological Survey (Water Resources Branch).

TABLE 107

DISCHARGE OF SACRAMENTO WEIR TO YOLO BY-PASS - 1941.

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1490	400	750	0	0							0
2	*613	294	1050	0								
3	230	178	1170	360								
4	78	104	1420	617								
5	0	0	1170	1030	0							
6	0		1070	981	104							
7	130		930	947	316							
8	460		786	912	338							
9	420		674	786	400							
10	380	0	579	731	400							
11	316	1030	500	674	400							
12	226	3580	440	598	440							
13	178	3580	380	500	520	FLOW	FLOW	FLOW	FLOW	FLOW		
14	440	1420	294	440	579							
15	579	1070	226	400	520						FLOW	
16	560	930	154	380	460							0
17	540	786	78	360	380	No	NO	NO	NO	NO	NO	250
18	460	712	0	272	380							460
19	400	655		202	294							500
20	338	579		104	78							520
21	294	617		0	0							520
22	380	655										460
23	480	560										380
24	579	500										294
25	655	520										154
26	840	500										26
27	930	460										0
28	850	500										0
29	786											202
30	674			0								338
31	540		0		0							294
Mean	479	701	376	343	181	0	0	0	0	0	0	142
Ac.Ft. for Month	29460	38940	23150	20420	11130	0	0	0	0	0	0	8723

* Last of the 3 bays which broke open December 27-28, 1940 was closed at 4:30 P.M.

NOTE: With exceptions of January 1 & 2 all flow shown is either leakage or flow over needles. Gates were not opened.

TABLE 108

DISCHARGE OF RECLAMATION DISTRICT 1001 DRAIN INTO CROSS CANAL*- 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	67	100	592	84	33	0	31	0				0
2	84	100	567	141	33	66	0					
3	67	100	592	140	41	0						
4	88	76	592	533	33	58						
5	183	66	592	592	33	0						
6	290	76	538	444	33	49		0				
7	422	67	232	585	25	25		53				
8	274	92	224	307	25	0	0	0				
9	224	216	150	340	25	33	20					
10	67	439	164	592	49	0	0					0
11	100	592	27	592	33	33						33
12	59	592	97	380	33	0						0
13	325	592	79	220	74	0	0		FLOW	FLOW	FLOW	
14	592	592	84	154	49	16	23					
15	592	592	76	98	41	0	0					0
16	455	440	10	97	50	0						30
17	259	341	68	82	41	38			NO	NO	NO	25
18	133	257	68	43	41	0						16
19	365	224	50	55	33	0						16
20	348	191	58	68	25	0	0					0
21	405	210	58	53	0	39	30					2
22	509	205	57	33	0	0	0					25
23	401	164	49	46	49	0						0
24	282	223	42	46	0	0						0
25	282	197	32	33	49	25						0
26	400	201	42	41	25	0						33
27	274	395	34	25	33	0						25
28	216	592	34	41	25	22						41
29	167		34	33	25	0	0					215
30	125		34	41	0	0	44					198
31	117		59		45		0	0				81
Mean	264	283	172	198	32	13	5.0	1.7	0	0	0	24
Ac.Ft. for Month	16200	15700	10600	11800	1990	801	309	105	0	0	0	1480

*Cross Canal, the main drain between Reclamation District 1000 and 1001, joins the Sacramento River at Mile 19.6L. Discharge is mainly from Feather River seepage.

TABLE 109

DISCHARGE OF RECLAMATION DISTRICT 1000 DRAIN (#3 PLANT) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	44	186	145	139	64	73	0	6	7	39	0	10
2	110	177	221	150	64	76		6	6	44		10
3	115	166	221	145	64	76		5	6	34		13
4	36	158	221	185	64	60		4	6	22		13
5	60	155	209	208	64	57		4	6	14	0	13
6	52	59	101	208	64	54		4	5	31	7	16
7	135	85	126	179	64	44		4	43	34	15	16
8	77	101	221	90	64	32		4	58	39	12	16
9	55	82	132	81	64	38		6	58	39	12	16
10	57	115	194	153	64	19		6	56	43	8	16
11	101	203	218	153	64	0		9	56	39	12	13
12	126	203	200	81	64	0		9	58	39	8	13
13	140	203	187	127	64	0		9	56	36	12	13
14	184	180	172	124	64	35	0	9	56	24	12	16
15	123	82	154	121	64	41	3	8	39	12	12	19
16	91	88	145	133	74	0	3	7	36	0	7	35
17	66	74	135	150	74	0	3	7	26		12	39
18	159	82	123	144	74	0	3	6	19		8	39
19	189	180	116	130	74	0	3	5	29		8	39
20	118	178	104	112	74	3	4	4	7		8	35
21	80	169	101	106	75	60	3	4	0		8	42
22	129	186	98	95	75	0	3	5	36		12	39
23	96	201	89	86	75	0	2	5	22		7	42
24	109	153	87	83	75	107	2	6	48		12	42
25	74	155	80	75	75	54	2	7	58		7	45
26	91	180	74	69	73	16	2	8	53		12	45
27	71	133	71	69	64	41	5	9	60		8	51
28	66	203	74	69	61	63	5	9	58		8	71
29	159		71	69	61	25	7	9	58		12	138
30	188		74	66	61	25	7	8	48		12	186
31	139		62		61		6	8		0		148
Mean	105	148	136	120	67	13	2	6	36	16	8	40
Ac.Ft. for Month	6430	8210	8380	7140	4140	781	125	397	2130	970	498	2480

NOTE: This is drainage from Reclamation District 1000 returned to Sacramento River by Pumping at Mile 6.85L. Additional water returned to Sacramento River at Mile 2.1L (See Table 110).

TABLE 110

DISCHARGE OF RECLAMATION DISTRICT 1000 DRAIN (2nd BANNON SLOUGH) - 1941

Day	Daily Discharge in Second-feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	68	0	649	0	0				0	0	0	
2	0		620	0								
3	153		605	140								
4	126	0	605	0								
5	225	123	404	564							0	
6	308	77	294	620							78	
7	577	0	0	620							0	
8	394	211	170	501								
9	147	315	0	364								
10	76	344		135								
11	0	591		269		DRAINAGE	DRAINAGE	DRAINAGE				DRAINAGE
12	0	591		417								
13	420	605		176								
14	614	488		0								
15	449	279		125								
16	289	286		0								
17	736	279			0	NO	NO	NO				NO
18	0	84			93				0			
19	387	84			0				74			
20	362	84							87			
21	429	77							0			
22	480	134							87			
23	313	84							0			
24	330	157										
25	283	77										
26	313	167										
27	212	395										
28	665	634										
29	0											
30	0			0					0	0	0	
31	0		0		0					72		
Mean	268	220	108	131	3	0	0	0	8	2	3	0
Ac.Ft. for Month	16500	12200	6640	7800	184	0	0	0	492	143	155	0

NOTE: This is drainage from Reclamation District 1000 returned to the Sacramento River by pumping at Mile 2.1 left. Additional water returned to Sacramento River at Mile 6.85 left (See Table 109).

TABLE 111

DAILY RECORD OF PRECIPITATION (IN INCHES) AT CHICO-1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.25	.52	.24								
2			.66	.21					.13		1.31	1.33
3	.14		.22	.30	.20						.64	.32
4	.27		.59	2.16	.04						.01	
5	.58			.09	.02							
6	1.01	.12				.20						
7	.27			.28				T				
8	.25	.45										
9		.62		.11								
10		1.66		.33								.12
11		.87		T	T							
12		.42			T					.06		T
13	1.33				.57							.65
14	1.08				.73							1.48
15	.67	.09		.21								1.30
16		.52									.13	.63
17	.01	.19									.01	
18		.51										.30
19	.99		.12						T	.04		
20	.14	.19										.34
21	.73	.44								.08		.04
22	.40	.05										
23	.70	.04										.60
24	.15	.79			T	.12						
25	.87											.40
26	.28	.06			T							.05
27		.81								1.57		.93
28		.61	.14								.07	1.64
29			.64	.09							.97	.64
30			.63	.12	.03						.62	
31			.73							.04		.23
Total for Month	9.87	8.69	4.25	4.14	1.59	0.32	0	T	0.13	1.79	3.76	11.00
Total for Year	45.54											

* United States Weather Bureau records.

TOTAL 112

DAILY RECORD OF PRECIPITATION (IN INCHES) AT M & T, INC.- CHICO LANDING-1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.27	.75	.10							.12	.05
2			.45	.30							.61	.60
3			.14	.27							.30	.28
4	.45		.69	.87							.36	
5	.57			.88								
6	.30	.25			.25							
7	1.00											
8	.57	1.40										
9		.60										
10		1.20		.55								
11		1.03		.17								
12		.98										.03
13	.20				1.10							.09
14	1.96				.23							.96
15	.56	.10										.59
16		.20		.22							.09	.25
17		.09										.17
18		1.11										.05
19		.07								.10		.22
20	1.19											
21	.46	.45										
22	.73	.11										
23	.08											
24	.60	.70										
25	.12											
26	.65											.55
27		.43		.12						1.33		.43
28		1.09								.12		.84
29			.43								.06	.81
30			.40								1.20	
31			1.16									
Total for Month	9.44	10.08	4.02	3.50	1.58	0	0	0	T	1.45	2.74	5.92
Total for Year	38.13											

*Record kept by M & T, Inc. at pumping plant at junction of Chico Creek and Sacramento River.

TABLE 113

DAILY RECORD OF PRECIPITATION (IN INCHES) AT LLANO SECO RANCHO - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.21	.35	.14							.66	
2			.54	.02	.16				.09		.08	.84
3	.40		.16	.29	.01						.57	.19
4	.11		.41	1.48	.02						.01	
5	.60	.22		.08	.04							
6	1.25											
7	.15			.15								
8	.50	.55										
9		.59		.11								
10		1.47		.15								.15
11		.60		.08	.03							
12					.44					.06		
13	1.05				.37							.13
14	.79											.77
15	.63	.05		.01								.75
16		.23									.05	.36
17		.22									.01	
18		.72										
19	.98		.11							.25		
20	.10	.18										.18
21	.96	.23								.01		.19
22	.04	.06										
23	.64	.04			.01							.14
24	.09	.68			.18	.10				.01		
25	.47											.34
26	.14	.09								.13		
27		.79								1.29		.78
28		.96	.11							.01	.08	.46
29			.50	.04							.86	.39
30			.40								.39	
31			.94									
Total for Month	8.90	7.89	3.52	2.55	1.26	.10	0	0	.09	1.76	2.71	5.67
Total for Year	34.45											

* Record kept by ranch at headquarters six miles below Chico Landing.

TABLE 114

DAILY RECORD OF PRECIPITATION (IN INCHES) AT COLUSA - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.14	.97	.30							.08	.04
2		T	.35	.17					.04		.31	.42
3			.05	.08	.15						.16	.57
4	.39		.91	.35	.02						.30	
5	.53			1.04	T							
6	.14	.37										
7	.73			.07								
8	.40	.62										
9		.50		.25								
10		.76		.02								.02
11		.38		.57								
12		.23			T							
13	.18				.54					.02		.12
14	1.50				.12							1.41
15	.45	.04										.19
16		.47		.03								.10
17		.03						T				.35
18		.44						T				T
19	.19											
20	.58									T		.11
21	.20	.20										.01
22	.32	.10										.01
23	.08											.21
24	.31	.40								.04		
25	.03	.05										.04
26	.22											.47
27		.35								1.88		.50
28		1.05	T								.10	.95
29			.33								.08	.88
30			.21	.18							.84	.02
31			1.05		.02							
Total for Month	6.25	6.13	3.87	3.06	0.85	0	0	T	.04	1.94	1.87	6.42
Total for Year	30.43											

*United States Weather Bureau records.

TABLE 115

DAILY RECORD OF PRECIPITATION (IN INCHES) AT MARYSVILLE - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.09	.01	.58					.18		.84	.15
2			.39	.06	.20						.29	1.24
3	.58		.32	.69	.02						.38	
4	.28		.12	1.58	T							
5	.22	.10	T	.01								
6	1.01	.14		.25								
7	.16											
8		.88										
9		.68		.34								.09
10		.72		.14								
11		.49										
12	.01	.01			.24							
13	2.23				.66							.73
14	.01	.01										.64
15		.36		T							.02	.40
16												.40
17		.31									.05	
18												.05
19	.55		.05							.26		
20		.36										.12
21	.67	.14										T
22	.16											.03
23	.42	.29										.31
24	.21	.18				.03				.04		
25	.47				.01							.41
26	.12	.18								.65		
27		.54								1.01		1.17
28		1.01	.29									.79
29			.22	.20							.65	.32
30			.20									
31			.58							.02		.13
Total for Month	7.10	6.49	2.18	3.85	1.13	0.03	0	0	0.18	1.98	2.23	6.98
Total for Year	32.15											

*United States Weather Bureau records.

TABLE 116

DAILY RECORD OF PRECIPITATION (IN INCHES) AT WILKINS SLOUGH - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.10	.25	.11					.02		.19	.21
2				.23	.14						.27	.51
3	.52		.79	.97							.24	
4	.46			.90								
5	.12	.30										
6	.51			.20								
7	.29	.54										
8		.65		.07								
9		.43		.22								
10		.12		.67								
11		.32										
12	.15				.92							.05
13	1.78				.05							.97
14	.41											.26
15	.02	.59		.26								.37
16		.08										.09
17		.22										
18	.10											
19	.59									.20		.09
20	.25	.34										
21	.34	.12										
22	.09											.22
23	.22	.32								.08		
24	.11											.30
25	.15											.21
26		.41								1.49		.70
27		.90								.08		.75
28		.90	.58								.27	.86
29			.40	.37							.75	
30			.90									
31			.18							.12		
Total for Month	6.11	6.34	3.10	4.00	1.11	0	0	0	.02	1.97	1.72	5.59
Total for Year	29.96											

*Near Grimes, at Reclamation District 108 pumping plant. Record kept by District.

TABLE 117

DAILY RECORD OF PRECIPITATION (IN INCHES) - RECLAMATION DISTRICT 1500 AT HINSDALE - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.02	.28	.20					.07		.25	.18
2				.25	.17						.30	.55
3	.75		.84	.20	.04						.25	
4	.53			1.30	.02							
5	.11	.25										
6	.65			.22								
7	.17	.60										
8		.66		.08								
9		.48		.16								
10		.11		.67								
11		.32										
12	.13				.85							T
13	1.30				.07							1.08
14	.52											.37
15		.54		.07								.35
16		.07						.02				.11
17		.15										T
18	.10											
19	.55									.06		
20	.25	.35										.36
21	.26	.08										.02
22	.06											.24
23	.30	.30								.11		
24	.08											
25	.20	.04										.48
26		.34								1.25		.48
27		.82								.03	.05	.04
28		1.34	.46								.15	.75
29			.37	.24							.62	
30			.88									
31	.10		.22							.08		.18
Total for Month	6.06	6.47	3.05	3.99	1.15	0	0	.02	.07	1.53	1.62	6.01
Total for Year	29.97											

*North end of Reclamation District 1500 - 2 miles east of Tisdale Weir.
Record kept by Reclamation District 1500.

TABLE 118

DAILY RECORD OF PRECIPITATION (IN INCHES) RECLAMATION DISTRICT 1500 AT ROBBINS - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.06	.23	.45					.02		.37	.20
2			.03	.10	.19				.02		.40	.79
3	.70		.92	.57	.10						.30	
4	.50			1.00	T							
5	.18	.25										
6	.72			.16								
7	.08	.63										
8		.50		.26								
9		.46		.25								
10		.23		.62								
11		.60										
12	.00				1.50							.07
13	1.48				.22							1.15
14	.27	.02										.34
15	.10	.46		.04							.05	.61
16		.06										.03
17		.13										.03
18	.07											
19	.52									.09		.05
20	.19	.23										.01
21	.38	.12										.02
22	.07											
23	.35	.39								.10		
24	.05											.11
25	.30											.53
26		.50								1.23		.41
27		.90								.07		.70
28		.95	.54								.04	.93
29			.15	.45							.61	.03
30			.98		.03							
31			.46							.05		.09
Total for Month	6.04	6.49	3.31	3.90	2.04	0	0	0	.02	1.54	1.77	6.25
Total for Year	31.36											

*South central portion of Reclamation District 1500.
Record kept by Reclamation District 1500.

TABLE 119

DAILY RECORD OF PRECIPITATION (IN INCHES) AT NICOLAUS - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.05	.71	.49							.06	
2			.33	.46							.41	.19
3			.22	.13	.28						.35	.97
4	.55		.64	.72	.18						.28	
5	.66		.03	.91	.01							
6	.10	.30										
7	.52			.24								
8	.05	.39										
9		.35		.10								
10		.42		.02								.05
11		.56		.56								
12		.75										
13	.09				1.29					.01		.02
14	1.56				.08							1.07
15	.36	.03										.31
16	.14	.32										.30
17		.08										.30
18		.27									.01	.03
19	.07											
20	.85	.01								.26		.08
21	.12	.20										.01
22	.53	.07										.02
23	.05											.09
24	.16	.32								.08		
25	.07					.01						.06
26	.31											.46
27		.28										.39
28		.63	.06							.91		.82
29			.58							.05	.02	.79
30			.20	.32							.60	.04
31			.02		.01							
Total for Month	6.19	5.11	3.59	4.75	1.05	0.01	0	0	0	1.31	1.73	6.00
Total for Year	30.62											

*United States Weather Bureau records.

TABLE 120

DAILY RECORD OF PRECIPITATION (IN INCHES) RECLAMATION DISTRICT 1500 AT KARNAK - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		.02	.20	.21					T		.36	.10
2			.15	.08	.21						.27	.81
3	.68		.69	.60	.08						.21	
4	.38			.99	.01							
5	.10	.33										
6	.77			.25								
7	.06	.43										
8		.56		.04								
9		.36		.70								
10		.49		.54								
11		.82										
12	.11				1.40							.10
13	1.75				.12							1.12
14	.32	.05										.30
15	.03	.30										.56
16		.04										.11
17		.15										.01
18	.10											
19	.51	.07								.07		.02
20	.07	.17										
21	.54	.15										.01
22	.06											.15
23	.13	.35								.07		
24	.03											.00
25	.40											.26
26		.35								1.03		.35
27		.60								.18		.06
28		.90	.54								.10	1.03
29			.18	.55							.54	.04
30			.80								.02	.23
31	.06		.51							T		.13
Total for Month	6.10	6.22	3.07	3.96	1.82	0	0	0	T	1.35	1.50	6.35
Total for Year	30.37											

*Southeast corner of Reclamation District 1500.
Record kept by Reclamation District 1500.

TABLE 121

DAILY RECORD OF PRECIPITATION (IN INCHES) AT KNIGHTS LANDING - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		T	.80	.32							.09	
2		.02	.18	.32					T		.30	.18
3			T	.00	.19						.32	.01
4	.65		.82	.54	.05						.22	
5	.43		T	1.21	T							
6	.10	.24										
7	.70	T		.12				T				
8	.07	.50										
9		.48		T								
10		.40		.46								T
11		.24		.55								
12		.62										
13	.08				1.37					T		.05
14	1.65				.18							1.14
15	.27	.02										.25
16	.06	.50										.41
17		.02						T				.23
18		.12									T	T
19	.07											
20	.48	T								.34		.06
21	.11	.18										
22	.54	.15								T		T
23	.10											.12
24	.29	.30								.06		
25	.02					T						.06
26	.24											.39
27		.39								1.12		.36
28		.83	.02							.15	T	.76
29			.58	T							.04	.91
30			.17	.40							.54	.04
31			.80		T							.14
Total for Month	5.86	5.01	3.45	4.00	1.79	T	0	T	T	1.67	1.59	5.91
Total for Year	29.98											

*United States Weather Bureau records.

TABLE 122

DAILY RECORD OF PRECIPITATION (IN INCHES) AT SACRAMENTO - 1941*

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1		T	.06	.94					T		.34	.10
2			.53	.05	.16						.25	1.23
3	.42		.37	.47	.04						.16	.02
4	.27	T	.05	1.86	.07							
5	.11	.14										
6	.70	.04						T				
7	.19	T		.18								
8		.66										
9		.38		.16								.02
10		.43		.69	T							
11		.92		.05	T							
12	T				.13					T		T
13	1.56				.95							.09
14	T	T										.94
15	.53	.29		T							.03	.71
16								T			.02	.54
17	.01	.17		T						T		
18												.07
19	.61		.02									
20		.12										.12
21	.42	.14								.02		.02
22	.17											
23	.23	.20										.16
24	.11	.23				.02				T		
25	.29				T				T			.18
26	.15	.13								.59		
27		.55								.25		.72
28		1.00	.28					T			T	.98
29			.50	.33							.37	.34
30	T		.13	.03	T						T	.05
31	.01		.92							T		
Total for Month	5.78	5.40	2.86	4.76	1.35	0.02	0	T	T	0.86	1.17	6.29
Total for Year	28.49											

*United States Weather Bureau records.

CHAPTER V

USE OF WATER IN THE SACRAMENTO - SAN JOAQUIN DELTA

As outlined in detail in preceding reports (1924 to 1933, inclusive) an investigation having as its objective a complete annual determination of the consumptive use of water in the entire Sacramento-San Joaquin Delta, comprised of experimental work to determine the unit consumptive use of water by the various irrigated crops and vegetation in the Delta and the general field work to obtain annually a complete census of the irrigated crops and water consuming areas. With the unit consumptive use of water determined by the experimental work and the complete census available, the former may be applied to the data of the latter to derive the consumptive use of water in the Delta as a whole or on individual tracts or islands.

Annual Census of Irrigated Crop Acreages and Water Consuming Areas

Detailed results of the census of the irrigated crop acreage in water consuming areas of the Delta as conducted by the Division of Water Resources are shown in the Reports for the years 1924 to 1932 inclusive and 1938, the detailed census being omitted for the years 1933 to 1937 and 1939 to 1941, inclusive. In the course of the Delta salinity investigations, in 1929 and 1930, it was found that in general all lands below certain elevation (5.0 U.S.G.S. datum) whether idle or cropped, receive and consume water derived by seepage from the adjacent channels. It was necessary, therefore, that all such lands be accounted for in computing the total consumptive use of water.

The cropped area is not suddenly changed from year to year, so that by making detailed surveys at intervals to determine the trend of land use it is possible to determine the total consumptive use for any particular year.

Consumptive Use of Water in the Sacramento-San Joaquin Delta

In Table 123 is shown the unit consumptive use of water in the Sacramento-San Joaquin Delta. These unit figures are those developed from experimental data and with one exception are those which are used in the computation for Bulletin No. 27 of the Division of Water Resources. The exception is the use of water by weeds which has been increased to correspond with a total annual consumption of 2.15 acre-feet per acre. This change was based on later weed tank experiments. It is possible that a continuation of the experimental work terminated in 1932 would indicate certain other changes in these unit figures with respect to aquatic growths, weeds and open water surfaces, but other than the above mentioned change for the item of idle land with weeds, the results of the work to date would apparently afford no justification for any material revision at this time of the figures previously used.

Table 124 shows the consumptive use of water in the Sacramento-San Joaquin Delta for the period 1924-1932 inclusive and 1938.

In previous years, when the crop surveys were made, the total consumptive use of water has been segregated to show the use in each river delta. Also shown was a classification of the irrigated crops with respect to the peat and sedimentary soils on which they were produced.

TABLE 123

UNIT CONSUMPTIVE USE OF WATER IN SACRAMENTO-SAN JOAQUIN DELTA**
Acre-feet per Acre

Crop or Classification	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total Seasonal Use	Total Annual Use
Alfalfa	(.06)	(.08)	.10	.30	.40	.50	.65	.55	.50	.20	(.10)	(.07)	3.20	3.51
Asparagus	.05	.05	.05	.05	.08	.14	.40	.68	.55	.42	.12	.10	2.69	2.69
Beans	(.06)	(.08)	(.08)	(.16)	(.20)	.14	.24	.58	.37	(.09)	(.07)	(.05)	1.33	2.12
Beets	(.06)	(.08)	(.08)	.13	.32	.51	.61*	.53*	.20*	(.13)	(.10)	(.07)	2.30	2.82
Celery	(.04)	(.04)	(.04)	(.08)	(.10)	.10	.10	.20	.25	.30	.20	.05	1.20	1.50
Corn	(.04)	(.04)	(.04)	(.08)	(.10)	.24	.85	.84*	.40*	.10	(.10)	(.07)	2.43	2.90
Fruit	(.04)	(.04)	(.04)	.18	.32	.50	.57	.40	.23	.07	(.07)	(.05)	2.27	2.51
Grain and Hay	(.04)	(.04)	.07	.60	.83	.20	(.14)	(.23)	(.21)	(.14)	(.07)	(.05)	1.70	2.62
Onions	(.04)	(.04)	.08	.13	.27	.49	.43	.20	(.16)	(.13)	(.10)	(.07)	1.60	2.14
Pasture	.08	.10	.20	.25	.25	.25	.25	.25	.20	.15	.10	.08	2.16	2.16
Potatoes	(.06)	(.08)	(.08)	(.16)	.15	.38	.52	.30	.15	(.09)	(.07)	(.05)	1.50	2.09
Seed	(.06)	(.08)	(.08)	.10	.25	.50	.50	.50	.35	.10	(.10)	(.07)	2.30	2.69
Truck	(.06)	(.08)	.10	.10	.25	.50	.45	.45	.30	.15	.10	(.07)	2.40	2.61
Tules	.16	.09	.30	.74	1.10	1.28	1.53	1.32	1.18	.98	.59	.36	9.63	9.63
Willows	.05	.03	.09	.22	.33	.38	.46	.40	.35	.29	.18	.10	2.88	2.88
Bare Land	.04	.04	.04	.08	.10	.13	.14	.13	.11	.09	.07	.05	1.02	1.02
Idle Land with Weeds***	.07	.09	.10	.19	.24	.31	.33	.28	.19	.15	.12	.08	2.15	2.15
Open Water Surfaces	.08	.13	.23	.34	.60	.76	.84	.78	.60	.33	.14	.08	4.91	4.91

NOTE: Figures shown in Brackets () represent estimated consumptive use on cropped areas before planting and after harvest. (Evaporation from bare land, use by weeds, etc.)

* Includes estimated additional use by weeds during these months.

** These are the data as determined for and published in Bulletin No. 27 - "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay" - Table 1, except that the figures for "Idle Land with Weeds" have been increased somewhat based upon later experimental work on the use of water by weeds.

*** Average for land below elevation 5.0 U.S.G.S. datum. Use on unirrigated lands above elevation 5.0 is considered zero.

TABLE 124

CONSUMPTIVE USE OF WATER IN THE SACRAMENTO-SAN JOAQUIN DELTA
1924 to 1932 and 1938

Year*	Water Consuming Area in Acres		Seasonal (2) Use of Water in Acre-feet		Seasonal Unit Consumption in Ac. Ft. per Ac.		Annual (3) Use of Water in Acre-feet		Annual Unit Consumption in Acre-feet per Ac.	
	Total (1)	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops
1924		319800		674840		2.11				
1925		315600		660900		2.10				
1926		316200		649560		2.06				
1927		315600		649090		2.06				
1928		321500		674920		2.10				
1929	420900	321800	1100140	689550	2.62	2.14	1250180	839590	2.97	2.61
1930	446800	338000	1161000	744000	2.60	2.20	1322000	895000	2.96	2.65
1931	446310	339300	1167390	756010	2.61	2.23	1319250	907870	2.96	2.68
1932	447430	336440	1181030	746800	2.64	2.22	1334060	899830	2.98	2.67
1938	448750	335670	1226850	760850	2.73	2.27	1380120	914120	3.08	2.72

* Annual census omitted for years 1933 to 1937, inclusive.

(1) Total includes interior and exterior water surface, bare and weed lands which consume seepage water, willow and tule areas, etc.

(2) Includes water used by crops and vegetation during the composite growing season and by evaporation for the entire year.

(3) Includes in addition to seasonal use, the use of water on the cropped area during the non-growing or dormant season.

NOTE: Prior to 1929 the annual census was not complete with respect to water consuming areas other than irrigated crop lands.

CHAPTER VI

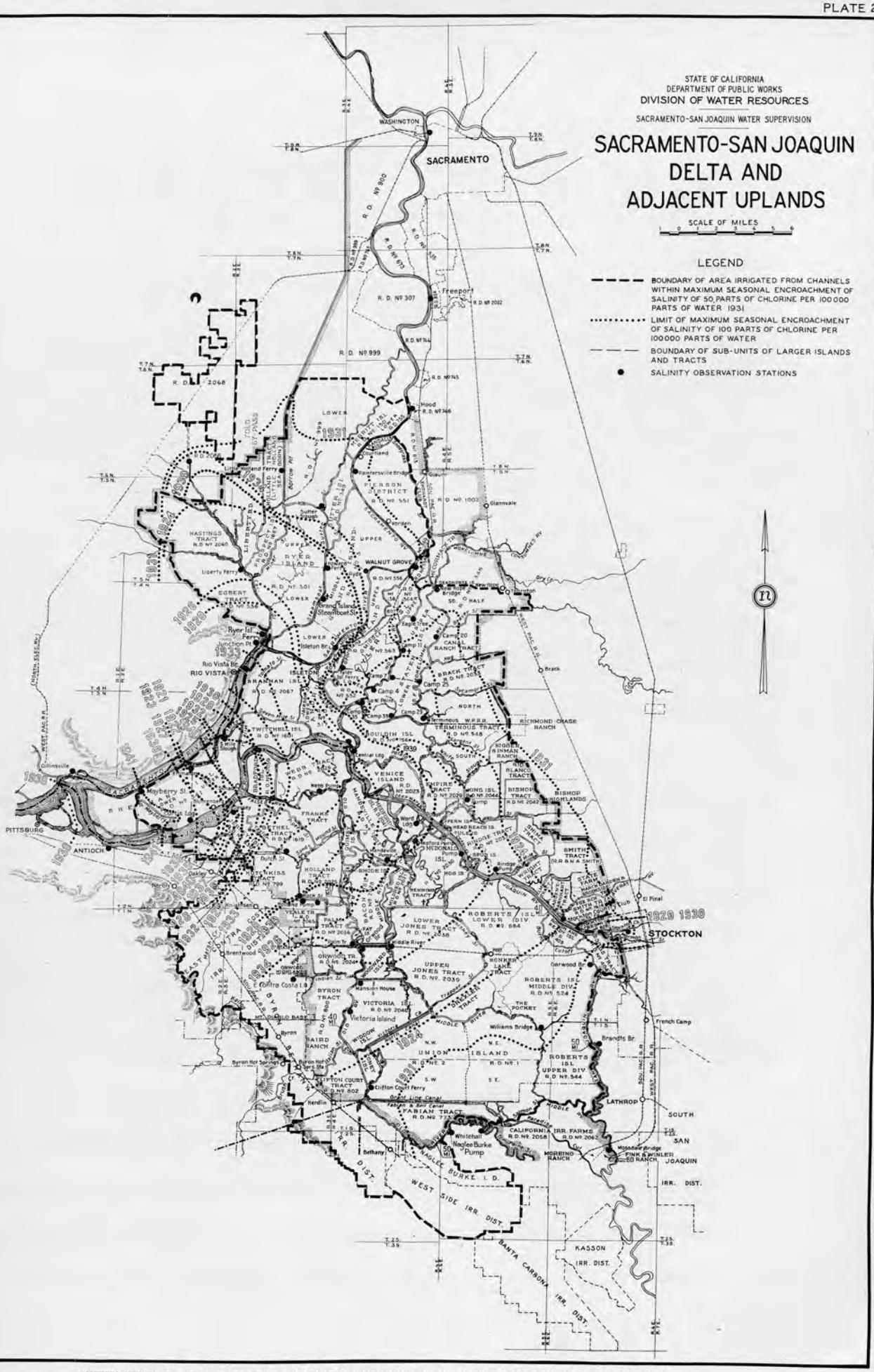
SALINITY INVESTIGATIONS

Purpose

The purpose of the salinity investigation, as outlined in previous reports, has been to record the occurrence and extent of salinity encroachment from San Francisco Bay, and to establish the relation between movement of salinity, stream flow to the Delta, and tidal action. As reported in Bulletin 27 of the Division of Water Resources, this relation was established for the conditions which obtained during the period of the special investigation for that Bulletin and upon the basis of all data available to that time. Subsequent investigations, therefore, have been directed to the maintenance of an unbroken record of the salinity, tidal and stream flow variations, essential not only in corroboration of the relation as at present established, but as the basis for a check of possible modifications in the relation due to changes in channel and tidal conditions which may have taken place or will occur in the future. Also, during periods of low stream flow, the continuation of salinity sampling has been essential in keeping Delta irrigators advised of conditions through periodic bulletins so that damage from the use of water of too high salt content might be averted.

Scope

The general scope of this investigation each season has been such as to insure that samples of water to be tested for salinity would be taken at regular intervals at a sufficient number of stations throughout the Delta and upper bay region so that the advance and retreat of the salinity from early summer to late fall would be completely recorded. Plate 2 shows the limit of encroachment into the Delta of 100 parts of salinity for the years



MAXIMUM SEASONAL SALINITY ENCROACHMENT OF 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER, SACRAMENTO-SAN JOAQUIN DELTA 1920-1941

1920 to 1941 inclusive.

Prior to 1941 twenty Bay and Delta sampling stations were maintained permanently throughout the year.

Station Maintenance and Records

Due to curtailment of appropriations by the Legislature to the 1941-1942 budget of the Division of Water Resources, sampling for salinity in the Bay and Delta areas was stopped by the Division of Water Resources on July 15, 1941. However, through cooperation of the Fontana Farms Company, the City of Antioch Water Department and the U. S. Bureau of Reclamation, miscellaneous samples were taken during the balance of the 1941 season and the results of the analyses are presented in Table 127A.

The salinity sampling at all stations, prior to July 15, 1941, was done by local observers. Each observer was provided with a schedule showing the exact time for taking the samples, so that, throughout the Delta at four-day intervals, all samples were taken at approximately one and one-half hours after the same high tide. The observers were furnished with stamped containers for the sample bottles so that the latter could be mailed as filled, to the laboratory at Sacramento. All testing was done at the Materials and Research Laboratory of the Division of Highways. The records of the tests of all samples taken in 1941 are given in Table 127 and Table 126 gives the location and description of each station.

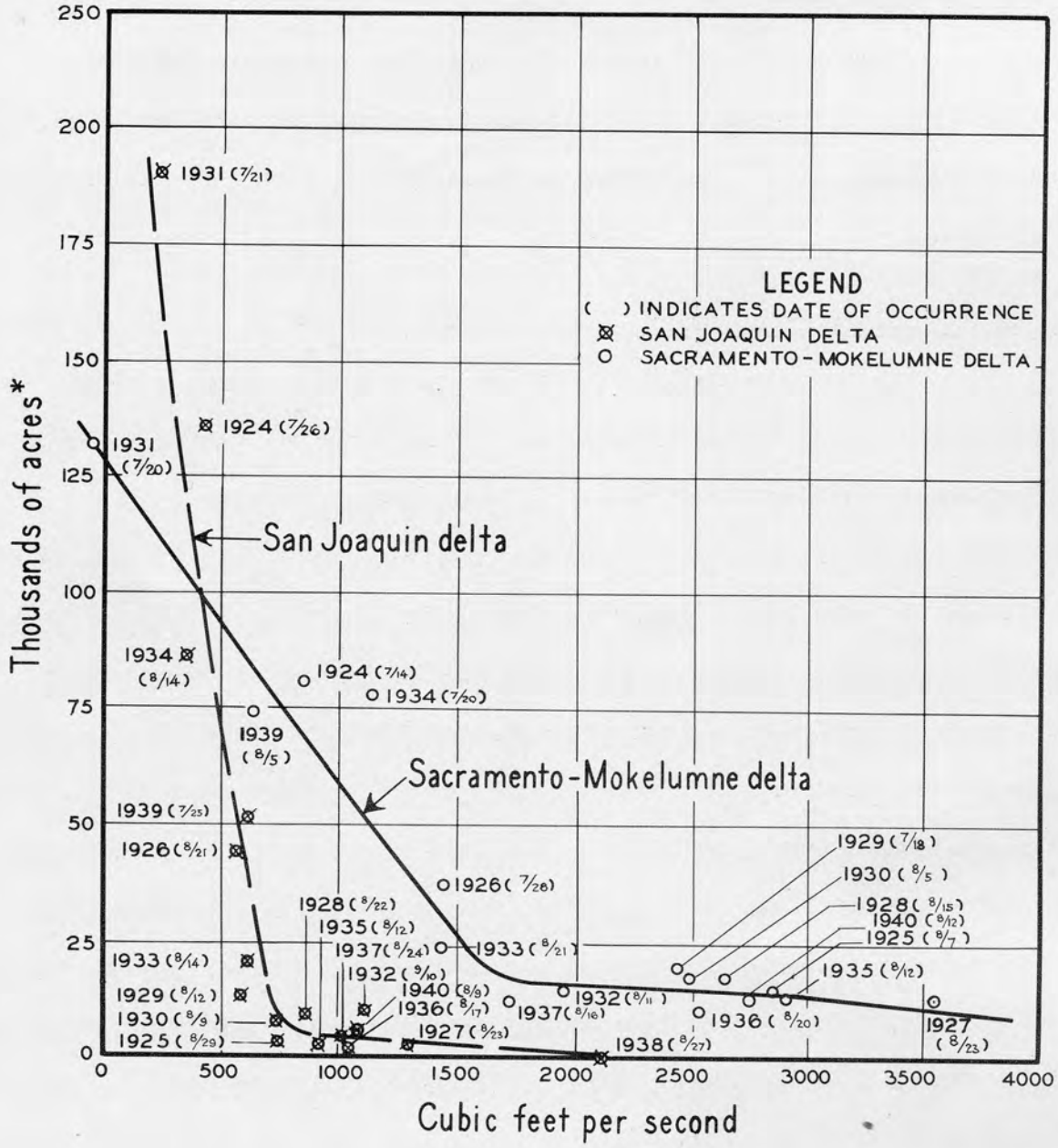
The maximum salinity as recorded at the stations operated prior to 1941, is shown in Table 125. For comparative purposes, this table shows also the maximum salinity recorded at these stations in previous years beginning with 1931.

Salinity Bulletins

During 1941 the stream flow into the Sacramento-San Joaquin Delta did not reach a stage low enough to allow any great penetration of saline water into the Delta. Therefore, no salinity bulletins were mailed during the year.

Area of Salinity Encroachment

There is a definite relation between the minimum ten-day stream flow to the Deltas to the area affected by salinity encroachment. This relationship is shown in Plate 3. The relation of the flow of the Sacramento and San Joaquin rivers to the area of their respective deltas affected by salinity has been shown, rather than combining the flows and treating the Delta as one area. Inspection of the plate indicates that when the flow to either delta drops below a certain point, the rate of salinity encroachment greatly accelerates. This point for the Sacramento-Mokelumne Delta is about 1750 cubic feet per second and for the San Joaquin Delta about 750 cubic feet per second. This shows that with a combined flow into the Delta, measured at Sacramento and Vernalis, of 2500 cubic feet per second, the whole Delta, with the exception of 25,000 acres in the extreme lower end, is protected from a salinity encroachment greater than 100 parts of chlorine per 100,000 parts of water. It also shows that when the flow drops below 2500 cubic feet per second the area affected increases much faster per unit of drop in flow than the area would decrease for the same unit of increase in flow. The areas shown on this plate are gross areas within the Delta boundaries and include all water surfaces, channels, levees, etc., and are not net irrigable areas. In Table 128 are shown the data from which Plate 3 has been constructed.



SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

RELATION OF MINIMUM 10 DAY STREAM FLOW OF SACRAMENTO AND SAN JOAQUIN RIVERS TO THEIR RESPECTIVE DELTAS, TO THE AREA OF EACH AFFECTED BY A SALINITY ENCROACHMENT GREATER THAN 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER

* AREA INCLUDES ALL LANDS, LEVEES, WATER SURFACES

Salinity Observations of Stream and Return Flow Channels

No samples of water were taken from stream and return flow channels in the Sacramento-San Joaquin areas during 1941.

TABLE 125

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1931-1941 INCLUSIVE*

Year	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Sacramento-San Joaquin Runoff in per cent of Normal**	30	78	48	43	91	96	80	170	43	115	138
Station (1)	Maximum Recorded Salinity in parts of Chlorine per 100,000										
San Francisco, San Pablo and Suisun Bays											
Point Orient	1870	1720	1800	1840	1720	1740	1700	1700	1920	1840	
Point Davis	1810	1520	1680	1800	1500	1440	1460	1460(2)	1840	1760	
Bullshead Point	1690	1320	1380	1640	1260	1340	1270	1160	1640	1340	
Bay Point	1540	1010	1160	1460	720	960	920	580	1480	990	
O and A Ferry	1390	620	900	1200	540	580	660	256	1180	720	
Innisfail Ferry	1400	680	900	1260	720	580	700	330	1360	790	
North San Pablo Bay											
Sonoma Creek Bridge	1660	1420	1620								
Grandview	1870	1460	1660								
Vallejo	1700	1300	1420								
Cuttings Wharf	1800	1200	1320								
Sacramento River Delta											
Collinsville	1260	500	620	1080	390	300	490	86	1040	450	195
Emmaton	1000	166	380	760	88	54	102	7	580	140	
Three Mile Slough Bridge	860	90	320	660	77	57	120		590		
Rio Vista Bridge	740	28	130	520	12	8	33		405		
Junction Point	620	(3) 7	74	410							
Ryer Island Ferry									375		
Liberty Ferry	560			230					241		
Grand Island (Steamboat Slu)				350					271		
Isleton Bridge	635	(3) 6	46	310					250		
Reclamation District 2068	280			176					82		
Howard Ferry	500			232					158		
Sutter Slough	320			50							
Little Holland Ferry	300			14					43		
Ryde	280			11					38		
Walnut Grove	220			10					18		
Paintersville Bridge	144			8							
Lisbon									8		
Sacramento	10	6	7	7	4	4	13	6	7	6	

* For maximum salinities recorded 1924-1930, see previous reports.
** Normal taken as 50-year mean (1889-1939) of natural runoff at foothill stations of major tributaries.
(1) For location and description see Table 126.
(2) Estimated. Samples not taken during period of maximum salinity.
(3) Maximum salinity obtained from first sample taken in season.

TABLE 125 (CONTINUED)

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1931-1941 INCLUSIVE*

Year	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Sacramento-San Joaquin Runoff in per cent of Normal**	30	78	48	43	91	96	80	170	43	115	138
Station (1)	Maximum Recorded Salinity in parts of Chlorine per 100,000										
Mokelumne River Delta											
Southwest Point	390		17	107					86		
Camp 33, Staten Island	245		13								
Tyler Island Ferry	200			10					16		
Camp 11, Staten Island	134		5	25					13		
Camp 29, Staten Island	182			52					32		
Camp 25, Staten Island	164		7						31		
Camp 20, Staten Island	124			18					22		
San Joaquin River Delta											
Antioch	1240	400	580	960	290	270	350	51	620	440	158
Curtis Landing	1060	280	470	810	180						
Jersey	910	150	280	(2)620	86	78	102	9	500		
Opposite Jersey							136				
Webb Pump	680	35	122	(3)340	16	16	25	8	265	27	
Central Landing	425	8	25	(4) 90	8	7					
Opposite Central Landing							11	10	138	15	
Dutch Slough	510	37	80	280	21	21	28	11	225	42	
Rock Slough West of Dam					8	11	13	9	94	15	
Camp 2, Medford Island									121		
Ward Landing	350			190							
Holland Pump	325	11									
Bacon Pump			25	160	11						
Mandeville Pump	350	18	29	166					104		
King Island Pump	261			104					79		
Rock Slough East of Dam					8	11	12	11	71	18	
Rindge Pump	198	16	22	94	18	20	20	15	62	29	
Orwood Bridge	277			107					54		
East Contra Costa I. D.	200			73					32		
Middle River	270	12	18	108	11	12	16	13	60	55	
Mansion House	240			90							
Victoria Island									35		
Stockton Country Club	122			44							
Clifton Court Ferry	130			40					19		
Stockton	132	72	66	76					32		
Garwood Bridge	92			38							
Brants Bridge	43			21							
Williams Bridge	118			43							
Naglee Burke Pump									14		
Whitehall	31			12							
Mossdale Bridge	12	14	13	25	12	14	12	12	16	14	

*For maximum salinities recorded 1924-1930 see previous reports.

**Normal taken as 50-year mean (1889-1939 of natural runoff at foothill stations of major tributaries.

(1) For location and description, see Table 126.

(2) Estimated maximum of 670 in period not covered by sampling.

(3) Estimated maximum of 350 in period not covered by sampling.

(4) Estimated maximum of 125 in period not covered by sampling.

TABLE 126

DESCRIPTION OF SALINITY STATIONS AT WHICH OBSERVATIONS ARE OR HAVE BEEN TAKEN

STATION	Miles from Golden Gate (1)	Time Interval between high tide at Golden Gate and time for taking samples at Station		LOCATION
		Hours	Mins.	
				SAN FRANCISCO, SAN PABLO AND SUISUN BAYS
Point Orient*	12.3	2	20	North End San Francisco Bay, East Shore, one-half mile south of Point San Pablo Wharf of Standard Oil Company
Point Davis*	25.2	3	15	East End San Pablo Bay, South Shore, Oleum Wharf of Union Oil Company.
Bullshead Point*	34.0	3	50	West End Suisun Bay, South Shore, Wharf of Mountain Copper Company.
Bay Point*	39.9	4	15	Suisun Bay, South Shore, Bay Point Wharf of Coos Bay Lumber Company.
C and A Ferry*	46.5	4	40	Upper End Suisun Bay between Mallard Station and Chipps Island at Sacramento Northern Railroad Ferry Crossing
Innisfail Ferry*	47.3	4	50	Montezuma Slough, about one mile east of Junction with Cutoff Slough, near North End of Grizzly Island.
				SACRAMENTO RIVER DELTA
Collinsville*	50.8	5	25	Sacramento River, North Bank, at Junction with San Joaquin River.
Emmaton*	57.7	5	45	Sacramento River, South Bank, Lower end of Horseshoe Bend.
Three Mile Slough Bridge	60.0	5	55	At Junction of Slough and Sacramento River
Rio Vista Bridge	63.5	6	05	At Highway Bridge near Northerly limits of Rio Vista.
Junction Point	65.2	6	10	Sacramento River, Right Bank, just below the Junction with Steamboat Slough.
Ryer Island Ferry	66.5	6	20	Lower end of Cache Slough, just above Steamboat Slough junction.
Liberty Ferry	67.6	6	25	Cache Slough at Junction with Prospect Slough.
Grand Island (Steamboat Slough)	68.2	6	30	Steamboat Slough at Grand Island Drainage Pumping Plant, three miles from Junction Point.
Isleton Bridge	68.7	6	30	Sacramento River, one mile upstream from Isleton.
Reclamation District 2068	70.7	6	45	Haas Slough, at Reclamation District 2068 pumping plant.
Howard Ferry	71.4	6	55	Steamboat Slough, 1½ miles below junction with Sutter Slough.
Sutter Slough	72.8	7	00	At junction with Miner Slough.

* Permanent station maintained throughout the year (prior to July 1941).

(1) Mileage measured to station along main channel. For stations off the main channel, the mileage shown is the distance along the main channel to a point whereon the time of the occurrence of the tidal phase is the same as that of the observation station.

TABLE 126 (CONTINUED)

DESCRIPTION OF SALINITY STATIONS AT WHICH OBSERVATIONS ARE OR HAVE BEEN TAKEN

STATION	Miles from Golden Gate (1)	Time Interval between high tide at Golden Gate and time for taking samples at Station		LOCATION
		Hours	Mins.	
				SACRAMENTO RIVER DELTA (CONTINUED)
Little Holland Ferry	73.2	7	05	Back Borrow Pit of Reclamation District 999, two miles above junction with Miner Slough.
Ryde	74.4	7	15	Sacramento River, Right Bank, at town of Ryde.
Walnut Grove	77.4	7	25	Sacramento River, Highway Bridge, at Walnut Grove.
Paintersville Bridge	77.6	7	25	Sacramento River one mile below Courtland.
Lisbon	85.0	8	20	East Borrow Pit of Yolo By-pass at Lisbon.
Sacramento*	103.5	9	30	Sacramento River at Southern Pacific Railroad Bridge.
				MOKELUMNE RIVER DELTA
Southwest Point	78.8	7	25	Staten Island, North Fork Mokelumne River, South Bank, just above junction with South Fork.
Camp 33, Staten Island	80.2	7	30	South Fork, Mokelumne River, North Bank, two miles above North Fork Junction.
Tyler Island Ferry	81.9	7	40	On Georgiana Slough, about due east of Isleton.
Camp 11, Staten Island	83.1	7	45	North Fork, Mokelumne River, East Bank, four miles above South Fork Junction.
Camp 29, Staten Island	83.4	7	50	South Fork, Mokelumne River, North Bank, opposite Terminus.
Camp 25, Staten Island	86.4	8	05	South Fork, Mokelumne River, West Bank, one mile above Sycamore Slough Junction.
Camp 20, Staten Island	88.9	8	30	South Fork, Mokelumne River, West Bank, one-half mile below Beaver Slu Junction.
				SAN JOAQUIN DELTA
Antioch*	54.9	5	55	San Joaquin River, at City Water Works pumping plant.
Curtis Landing	58.9	6	10	San Joaquin River, Right Bank, about three-fourths mile above Antioch Toll Bridge.
Jersey	61.4	6	20	San Joaquin River, Left Bank, one mile below mouth of False River.
Opposite Jersey	61.4	6	20	San Joaquin River, Right Bank, opposite Jersey.
Webb Pump*	72.0	7	00	False River, two miles below Old River Junction.
Central Landing*	72.0	7	00	Mokelumne River at Central Landing, Bouldin Island. (Prior to 1937.)

* Permanent station maintained throughout the year. (Prior to July 1941.)

(1) Mileage measured to station along main channel. For stations off the main channel, the mileage shown is the distance along the main channel to a point whereon the time of the occurrence of the tidal phase is the same as that of the observation station.

TABLE 126 (CONTINUED)

DESCRIPTION OF SALINITY STATIONS AT WHICH OBSERVATIONS ARE OR HAVE BEEN TAKEN

STATION	Miles from Golden Gate (1)	Time Interval between high tide at Golden Gate and time for taking samples at Station		LOCATION
		Hours	Mins.	
				SAN JOAQUIN DELTA (CONTINUED)
Opposite Central Landing*	72.0	7	00	Mokelumne River, on Andrus Island directly opposite Central Landing on Bouldin I.
Dutch Slough*	73.0	7	05	At Bethel Island Bridge.
Rock Slough West of Dam*	77.0	7	20	In Rock Slough, West of Dam at Junction of Sand Mound Slough and Rock Slough.
Camp 2, Medford Island	78.0	7	25	San Joaquin River (Stockton Channel) at north end of Medford Island.
Ward Landing	79.6	7	35	San Joaquin River near junction with Little Connection Slough on Southwest side of Empire Tract.
Holland Pump	80.6	7	40	Rock Slough, North Bank, 1½ miles west of Old River Junction.
Bacon Pump	82.9	7	50	Old River at Bacon Island Drainage Pumping Plant, near junction with Rock Slough.
Mandeville Pump	83.0	7	50	Connection Slough, North Bank, one mile west of Middle River on South end of Mandeville Island
King Island Pump	84.2	8	00	Honker Cut at Empire Tract - King Island Ferry.
Rock Slough East of Dam*	85.4	8	05	In Rock Slough, three-fourths of a mile East of Junction with Sand Mound Slough
Rindge Pump*	86.1	8	10	San Joaquin River, North Bank, one mile below Fourteen Mile Slough Junction.
Orwood Bridge	86.3	8	10	Old River, at Santa Fe Railroad Crossing, Orwood.
East Contra Costa I.D.	86.7	8	20	Indian Slough, at East Contra Costa Irrigation District Pumping Plant.
Middle River P. O.	87.7	8	20	Middle River, East Bank, at Santa Fe Railroad Crossing
Mansion House	88.4	8	30	Victoria Island, Old River, East Bank, at Junction with North Victoria Canal.
Victoria Island	89.6	8	35	Old River at Borden Highway Crossing
Stockton Country Club	90.8	8	45	On Lindley Cutoff (San Joaquin R.), North Bank, 3/4 mi. above Burns Cutoff Junction
Clifton Court Ferry	94.2	9	10	Old River just below Junction with Grant Line Canal.
Stockton	94.8	9	15	Near head of Stockton Channel at wharf of California Transportation Company.
Port Stockton*	94.0	9	15	At lower end of Port Stockton wharves.
Garwood Bridge	95.3	9	15	San Joaquin River. At drawbridge one mile above Santa Fe Railroad Crossing.
Brandt Bridge	100.6	9	50	San Joaquin River. At drawbridge six miles above Santa Fe Railroad Crossing.
Williams Bridge	101.6	9	55	Middle River, about four miles below Salmon Slough Junction.
Naglee Burke Pump	102.5	10	00	Old River at Naglee Burke Pumping Plant.
Whitehall	104.8	10	20	Old River West of Junction of Salmon Slu and Paradise Cut. Due north of Tracy.
Mossdale Bridge*	108.5	10	50	San Joaquin River at Lincoln Highway Crossing about 3 miles southwest of Lathrop.

* Permanent station maintained throughout the year. (Prior to July 1941.)

(1) Mileage measured to station along main channel. For stations off the main channel, the mileage shown is the distance along the main channel to a point whereon the time of the occurrence of the tidal phase is the same as that of the observation station.

TABLE 127

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water
1941

Station	JANUARY															
	2		6		10		14		18		22		26		30	
San Francisco, San Pablo and Suisun Bays																
Point Orient	600		800		1040		1000		760		900		700		600	
Point Davis										e	220					
Bullshead Point	a 18															
Bay Point					11										5	
O & A Ferry	a 5	a	7		8		6	a	4	ab	5		3			
Innisfail Ferry	45		56		62		52		60		44		39	a	20	
Sacramento River Delta																
Collinsville	6		5		5		3		7				5	a	4	
Emmaton	4				6	a	4				2		2			
Sacramento	2		3		3		3		3		1		1		2	
San Joaquin River Delta																
Antioch					8		7		6		5		5		5	
Webb Pump	a 10					a	9				7	a	6			
Opposite Central Landing	3		6		2		5		5		2		1	a	4	
Dutch Slough	a 13		13		12		9		12		10		10		9	
Rock Slough West	9		11		11		8		9		7		9		12	
Rock Slough East	10		9		11		7		12		9		8		11	
Rindge Pump	5		10		5		6		7		7		6		5	
Middle River	8		8		5									b	9	
Mossdale Bridge							4		5		6		5		4	
Stockton	8					a	3					b	2			

Station	FEBRUARY							
	2	6	10	14	18	22	26	
San Francisco, San Pablo and Suisun Bays								
Point Orient	590	960	920	380	660	740	620	
Point Davis	98		410	48				
Bullshead Point			21	9	1	11		
Bay Point				5				
O & A Ferry	a 5	5	17	4	5	6	5	
Innisfail Ferry	22		24	30	16	17	24	
Sacramento River Delta								
Collinsville	a 3	3		3	3	4	2	
Emmaton			ab 4		2			
Sacramento	2	2	3	3	1	3	2	
San Joaquin River Delta								
Antioch	6	4	5	4	6	7	6	
Webb Pump		5	b 7				8	
Opposite Central Landing	3	3	3	a 1	2	5	b 6	
Dutch Slough	9	11	10	9	3	9	7	
Rock Slough West	12	14	14	9	9	16	9	
Rock Slough East	13	12	13	8	10	12	11	
Rindge Pump	5	6	9	5	8	8		
Middle River		7	6	7	6	6	6	
Mossdale Bridge	2	4	3	2	5	5	6	
Stockton					6			

a, b, c, d, e, f, see footnotes last page of this table

TABLE 127 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water
1941

Station	MARCH																	
	2		6		10		14		18		22		26		30			
San Francisco, San Pablo and Suisun Bays																		
Point Orient	490		430		780		620		770		890		1080		860			
Point Davis			50				110		200									
Bullshead Point	a 13	a	13	ab	10	b	6		7	b	13	b	145		152			
Bay Point			8		8			a	6	b	10	a	9		5			
O & A Ferry	a 6	ab	5		4		5	a	8	ab	7	b	10	a	6			
Innisfail Ferry	a 22	b	10		13		10		25		28	b	29	a	29			
Sacramento River Delta																		
Collinsville	a 4	a	3		3	a	5		4		3		5		6			
Emmaton	3						4				6	a	5		4			
Sacramento	3		2		3		3		6		5	a	2		3			
San Joaquin River Delta																		
Antioch	a 4		7		6		5		7		5	a	8	a	6			
Webb Pump			7			a	6					a	6		8			
Opposite Central Landing	3		2		4		3	a	4		5	a	2		4			
Dutch Slough	6		6		4		6		7		5	a	5		8			
Rock Slough West	9		6		10		8		6		7	a	6		8			
Rock Slough East	6		7		7		8		5		7	a	4		7			
Rindge Pump	6		7		5		5	a	4		5	a	4		5			
Middle River	6		7		5		5		7		5	b	5	a	7			
Mossdale Bridge	5		5		6		4		4		4	b	5		5			
Stockton												b	11	a	10			

Station	APRIL																	
	2		6		10		14		18		22		26		30			
San Francisco, San Pablo and Suisun Bays																		
Point Orient	680		670	b	650		720		710		770	b	620		570			
Point Davis	300								170	ab	580							
Bullshead Point	32		8	b	11		10	a	8	b	79	b	66		30			
Bay Point		ab	5	a	2			a	6	a	7	a	6					
O & A Ferry	a 5	ab	5	a	3		8	a	6	b	4	a	7	a	5			
Innisfail Ferry	29		21	ab	14	a	17		15	a	18	a	23	a	22			
Sacramento River Delta																		
Collinsville			5				3		3				6		4			
Emmaton			5				3		4									
Sacramento	4		7	b	2		4		5	a	5		5		3			
San Joaquin River Delta																		
Antioch	8		7	a	3	a	4		7	a	8	a	6	a	5			
Webb Pump	4	a	7		5				6	a	7							
Opposite Central Landing	4		3	a	5		2		3	a	6	a	4		4			
Dutch Slough	8		7	a	10		5		6	a	5	a	11		7			
Rock Slough West	8		7	b	6		6		6	a	5	a	6		7			
Rock Slough East	7		8	b	8		7		8		6	a	6		6			
Rindge Pump	7		6				6		8	a	5		6					
Middle River	2		5	b	5		4		5	b	4	b	6		8			
Mossdale Bridge	6		3	b	3		4		7	b	5				3			
Stockton	11	a	8	b	8				10	b	9				7			

a, b, c, d, e, f, see footnotes last page of this table.

TABLE 127 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water
1941

Station	MAY															
	2		6		10		14		18		22		26		30	
San Francisco, San Pablo and Suisun Bays																
Point Orient	1030		940	b	1200		770		660		1140	b	920		830	
Point Davis	340		390	b	490		250		180							
Bullshead Point	a156			b	143		11	a	12	b	89	a	15		640	
Bay Point	8	a	17	a	8		6	a	3		5		7		6	
O & A Ferry	a 4	a	5	a	3		4		6	b	6		6		5	
Innisfail Ferry	27	a	23	a	21	a	21		17	ab	12	a	16			
Sacramento River Delta																
Collinsville	6		6				6	a	10	a	3	b	3		4	
Emmaton	2			a	4			a	4			b	3			
Sacramento	b 6	a	4	b	4		3	a	3	b	3	ab	4		4	
San Joaquin River Delta																
Antioch	8	a	8	a	3	a	2	a	7	a	4	a	5		5	
Webb Pump			7				3									
Opposite Central Landing	3	a	2	b	2		2	a	3	b	5	b	3		3	
Dutch Slough	9	a	5	a	3		3	a	4	a	3	a	5		4	
Rock Slough East	2	a	2	a	4		4	a	8	a	3	b	5		3	
Rock Slough West	8	a	3	a	4		5	a	5	a	6	b	5		4	
Rindge Pump	5	a	4	a	4		4	a	5	a	6		6		7	
Middle River	a 3	b	5	b	4		2	a	3		4	b	7		3	
Mossdale Bridge	b 2			ab	3		5	b	4	b	6	b	3		4	
Stockton	4	a	5		9	ab	5	ac	8	b	6	ab	10	b	7	

Station	JUNE															
	2		6		10		14		18		22		26		30	
San Francisco, San Pablo and Suisun Bays																
Point Orient	730		1250	b	1150		1080		1080	b	1100	b	1280		1280	
Point Davis	500		550		600				400				570		780	
Bullshead Point	97			a	20	a	44		93	a	225		385	a	170	
Bay Point			6	a	6					a	10			a	9	
O & A Ferry	5	b	5	b	8		6	b	4	b	3	b	5		5	
Innisfail Ferry	a 16	a	9	a	13	a	12		11	a	11	b	11	a	11	
Sacramento River Delta																
Collinsville	a 8	a	3	a	6	a	4	ab	4	a	5	a	4		3	
Emmaton	a 5			a	4			a	5			a	3			
Sacramento	a 3	b	2	b	3	a	3		4	b	3	b	2	a	3	
San Joaquin River Delta																
Antioch	a 5	a	3	a	3		4	a	2	a	5	a	5	a	2	
Webb Pump		a	7			a	2	a	1							
Opposite Central Landing	a 7	a	3		4	a	4	a	3	a	3	b	2	a	4	
Dutch Slough	a 4	a	4			a	3	a	6	a	4		4	a	2	
Rock Slough East	a 4	a	3	b	2	ab	3	a	2	a	3	b	3	a	3	
Rock Slough West	4	a	3	b	3	ab	3	a	4	a	4	b	3	a	4	
Rindge Pump	a 3	a	4	a	2	a	3		2			a	6		4	
Middle River	b 3	b	2	b	2	b	5	b	2	b	3	b	3	a	2	
Mossdale Bridge	b 3	b	3	b	3	b	4	b	4	b	3	b	5			
Stockton	ab 7	ab	5	ab	6		5	b	8	a	10	b	8	a	5	

a, b. c, d, e, f, see footnotes last page of this table

TABLE 127 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water
1941

Station	JULY															
	2		6		10		14		18		22		26		30	
							San Francisco, San Pablo and Suisun Bays									
Point Orient	1100		1500	b	1300		1320									
Point Davis			920	b	900		780									
Bullshead Point				a	27		95									
Bay Point	18	a	23				82									
O & A Ferry	6	b	16	b	28											
Innisfail Ferry	13	a	12	ab	23		25									
							Sacramento River Delta									
Collinsville	4	a	5	b	4		8									
Emmaton				a	6		7									
Sacramento	1	a	6	b	3		3		4							
							San Joaquin River Delta									
Antioch	4	a	4		4		4		9							
Webb Pump		a	6	b	5				6							
Opposite Central Landing	3		5	b	8		5	a	7							
Dutch Slough	5	a	3	b	6	a	6									
Rock Slough West	3	a	3	b	5		4		3							
Rock Slough East	9	a	5	b	8	a	5	a	6							
Rindge Pump	5	a	4	a	1		6									
Middle River	6		4	b	6		6									
Mossdale Bridge	5	a	3	b	6		6									
Stockton	5		6	b	6		9									

a Low high tide.
b Taken on following day.
c Taken two days later.
d Over one hour off scheduled time.
e Taken on preceding day.
f Taken two days earlier.

TABLE 127A

MISCELLANEOUS SALINITY OBSERVATIONS 1941
SACRAMENTO-SAN JOAQUIN DELTA
Chlorides in parts per 100,000 parts of water

Samples taken by Fontana Farms Co.

Date 1941	Sacramento River 1700' West of Collinsville Gage (at 36" Calco Gate)	Meins Landing on Montgomery Slough 6 miles from Collinsville
July 2	3	15
26	12	27
Aug. 7	56	86
25	156	220
Sept. 5	161	307
22	160	390
Oct. 4	129	422
23	195	
Nov. 1	80	396
5	41	397
15	29	364
22	40	337
29	70	316
Dec. 1	45	
4	17	274
6	5	
8	11	148
10	8	251
15	4	258
19	3	83
22	12	
26	5	12

Samples taken by City of Antioch

Date 1941	San Joaquin River at Water Works Wharf		
July 2	1	Sept 2	82	Nov. 2	39
6	1	6	100	6	21
10	2	10	158	10	12
14	2	14	127	14	9
18	2	18	82	18	20
22	4	22	115	22	12
26	7	26	105.	26	10
30	18	30	95	30	27
Aug. 2	5	Oct. 2	-	Dec. 2	16
6	29	6	73	6	11
10	21	10	56	10	4
14	28	14	55	14	4
18	38	18	40	18	3
22	70	22	45	22	-
26	110	26	60	26	3
30	80	30	50	30	3

TABLE 127A (Continued)

MISCELLANEOUS SALINITY OBSERVATIONS 1941

SACRAMENTO-SAN JOAQUIN DELTA

Chlorides in parts per 100,000 parts of water

SACRAMENTO RIVER DELTA

Date 1941	Collinsville	Emmaton	Snodgrass Slough (1)	Freeport Bridge (2)	Sacramento
Oct. 10		5			
Nov. 10	8	2	1	2	1
Dec. 8	1	1	1	1	1

SAN JOAQUIN RIVER DELTA

Date 1941	Antioch	Webb Pump	Opposite Central Landing	Dutch Slough	Rock Slough (3)	Sand Slough (4)	Rindge Pump	Middle River	Port Stockton	Mossdale
Oct. 10	50	7		9	8	9		8		
Nov. 10	12	5	3	8	7	8	8	7	10	8
Dec. 8	5	4	1	7	8	8	7	7	9	3

(1) Sacramento River opposite head of Snodgrass Slough.
(2) Sacramento River at Freeport Bridge.
(3) Rock Slough east of Dam, in Rock Slough, 3/4 of a mile east of junction with Sand Mound Slough.
(4) Sand Mound Slough, north of Dam at Junction of Sand Mound Slough and Rock Slough.

TABLE 128

MINIMUM TEN-DAY STREAM FLOW TO DELTAS OF SACRAMENTO AND SAN JOAQUIN RIVERS AND AREA OF EACH AFFECTED BY SALINITY ENCROACHMENT GREATER THAN 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER

Year	Flow for Minimum 10-day period (1)					Runoff in % of Normal*			Area Affected by Salinity					
	Sacramento River at Sacramento		San Joaquin River at Vernalis		Sacramento and San Joaquin to Delta	Sacramento and San Joaquin to Delta	At Sacramento	At Vernalis	All Deltas		Sacramento and Mokelumne		San Joaquin	
	Date	c.f.s.	Date	c.f.s.	c.f.s.				% of Total	Acres (2)	% of Total	Acres (3)	% of Total	Acres
1920		540(4)		450(4)		52	48	66	15.1	65800	7.7	33500	7.4	32300
1921						118	126	95	2.1	9150	2.0	8715	0.1	435
1922						103	95	123	2.9	12600	2.4	10420	0.5	2180
1923						76	70	88	2.1	9150	2.0	8715	0.1	435
1924	7/14	858	7/26	407	1260	28	30	24	50.0	217500	18.4	80100	31.6	137400
1925	8/7	2860	8/29	743	3730	86	84	88	3.6	15630	3.1	13450	0.5	2180
1926	7/28	1460	8/21	586	2080	60	63	56	18.5	80500	8.5	37000	10.0	43500
1927	8/23	3560	8/23	1300	4850	121	127	104	2.9	12600	2.4	10420	0.5	2180
1928	8/15	2660	8/22	866	3550	84	89	70	5.7	24800	3.7	16100	2.0	8700
1929	7/18	2460	8/12	590	3090	44	44	46	7.1	30900	4.2	18300	2.9	12600
1930	8/5	2500	8/9	735	3230	65	71	53	5.4	23500	3.8	16500	1.6	7000
1931	7/20	79	7/21	211	131	30	32	27	73.8	321000	30.2	131000	43.6	190000
1932	8/11	1980	9/10	1030	3030	78	69	106	5.7	24800	3.4	14800	2.3	10000
1933	8/21	1450	8/14	607	2070	48	46	54	9.8	42600	5.2	22600	4.6	20000
1934	7/20	1150	8/14	346	1530	43	45	37	37.5	163000	17.8	77500	19.7	85500
1935	8/12	2920	8/12	922	3940	91	87	103	2.9	12600	2.4	10420	0.5	2180
1936	8/20	2540	8/17	1040	3600	96	92	104	2.6	11600	2.2	9840	0.4	1760
1937	8/16	1720	8/24	1020	2820	80	70	105	3.5	15200	2.6	11280	0.9	3920
1938	8/12	5190	8/27	2130	7365	170	167	180	0	0	0	0	0	0
1939	8/5	630	7/25	610	1315	43	43	46	29.0	126000	17.0	74000	12.0	52000
1940	8/12	2550	8/9	1080	3620	115	118	105	4.2	18300	3.0	13000	1.2	5300
1941	8/24	4190	9/14	1480	5800	138	142	127	1.2	5100	1.2	5100	0	0

*Normal = 50 year mean (1889 - 1939). For comparison of 40 and 50 year means, see Tables 1, 2 and 3.

(1) For minimum daily flow see Tables 1 and 2. For minimum 10-day flow see Tables 1A and 2A.
(2) Delta area taken at 435,000 acres which includes all lands, levees, water surfaces, etc., within delta boundary.
(3) Sacramento and Mokelumne deltas combined as the Sacramento River contributes a large flow to Mokelumne River delta through Georgiana and Three Mile Sloughs.
(4) No continuous record. Lowest discharge measured.

CHAPTER VII

TIDE GAGES

In order to determine the behavior of the tides in the Sacramento-San Joaquin Delta and Upper Bay, 27 recording tide gages are being operated, 17 by the Division of Water Resources, 4 by the U. S. Army Engineers, and 6 by the U. S. Bureau of Reclamation. These gages are scattered throughout the area and the location and a description of each station are given in Table 121. The table also shows when the gage was first installed. The gages have been operated continuously since their installation, with the exception of minor breaks in the record due to stoppages, etc. Only one gage has been out of commission for any length of time, this one being at the San Joaquin end of Three Mile Slough. It was out of operation from September 1935 until July 1938.

The charts from the State-owned and operated gages are on file and the data for some of them have been tabulated.

During 1929, 1930 and 1931 gages were operated at many other points for short periods. Bulletin 27 of the Division of Water Resources gives the data obtained from these gage operations.

During the fall of 1939 the United States Coast and Geodetic Survey ran a line of first order levels between Galt-Fairfield and Stockton and ultimately all of these gages will be tied to sea level datum, thus bringing all gages in the delta area to one datum plane.

Plate 4 shows the location of all the recording gages now in operation.

LEGEND

- U.S.B.R. STATION
- U.S.E.D. STATION
- D.W.R. STATION

SACRAMENTO – SAN JOAQUIN WATER SUPERVISION

LOCATIONS OF RECORDING TIDE GAGE STATIONS

SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN BAY

SCALE OF MILES

2 0 2 4 6 8 10

TABLE 129

LOCATION AND DATE OF INSTALLATION OF RECORDING TIDE GAGES IN SACRAMENTO-SAN JOAQUIN DELTA AND SUISUN BAY

Name of Station	Operated by*	Location	Date Installed
		SACRAMENTO DELTA	
Sacramento	D.W.R.	Left bank of Sacramento River at Southern Pacific Railroad Bridge.	1920
Snodgrass Slough	D.W.R.	Left bank, Sacramento River; about 0.1 mile above Hollister landing about ¼ mile above head of Snodgrass Slough (now leveed off).	Aug. 1939
Walnut Grove	D.W.R.	Left bank of Sacramento River at head of Georgiana Slough; lower end of town of Walnut Grove.	Feb. 1929
Rio Vista	U.S.E.D.	Right bank of Sacramento River at U. S. Engineers depot below Rio Vista; about 1½ miles below Rio Vista Bridge	Apr. 1908
Three Mile Slough (Sac.)	D.W.R.	On Brannon Island side of Slu. Pile dolphin about 0.1 mile from Three Mile Slu Bridge.	Apr. 1929
Mayberry Slough	U.S.E.D.	Right bank of Sacramento River about four miles above Collinsville	Prior to 1929
Collinsville	D.W.R.	Right bank of Sacramento River. On pile dolphin about 0.1 mile upstream from junction of mainstreet and river.	June 1929
		MOKELUMNE DELTA	
New Hope Bridge	D.W.R.	Right bank of the south fork of Mokelumne River; just below New Hope Bridge.	Aug. 1920
Terminous	U.S.B.R.	On highway bridge over Potato Slough between Terminous Tract and Bouldin Island	July 1940
Georgiana Slough	D.W.R.	On Andrus Island near junction of Georgiana Slough and Mokelumne River. At former location of Golden State Asparagus Company Plant.	June 1929
		SAN JOAQUIN DELTA	
Mossdale Bridge	D.W.R.	Right bank of San Joaquin River just below U.S. 40 crossing.	1920
Grant Line	U.S.B.R.	Right bank of Grant Line canal at Tracy road crossing	Oct. 1940
Brants Bridge	U.S.B.R.	Right bank of San Joaquin River at Brandts Bridge between Roberts Island and mainland.	July 1940
Stockton	U.S.E.D.	At head of McLeod Lake; El Dorado Street.	Dec. 1927

* D.W.R. - Division of Water Resources; U.S.E.D. - United States Army Engineers; U.S.B.R. - United States Bureau of Reclamation.

TABLE 129 (CONTINUED)

LOCATION AND DATE OF INSTALLATION OF RECORDING TIDE GAGES IN SACRAMENTO - SAN JOAQUIN DELTA AND SUISUN BAY

Name of Station	Operated by(1)	Location	Date Installed
		SAN JOAQUIN DELTA (Continued)	
Burns Cut-off	U.S.B.R.	On Stockton ship canal at East Bay Municipal Utility District Crossing. Northwest corner of Rough and Ready Island.	May 1940
Rindge	D.W.R.	At southeast corner of Rindge Tract, On Fourteen Mile Slough at Junction with Ship Canal.	July 1939
Middle River (Borden)	D.W.R.	Left bank of Middle River just below Borden Highway Bridge. On Victoria Island	July 1939
Old River (Mansion House)	D.W.R.	Right bank of Old River at Mansion House. On Victoria Island. On timber dolphin.	Aug. 1939
Mandeville	U.S.B.R.	South side of Mandeville Island. On Mandeville cut at beet dump about one mile west of Bacon-Mandeville ferry.	July 1940
Rock Slough	U.S.B.R.	North bank of Rock Slough near head of slough. About 1½ miles east of Knightsen.	May 1936
Venice Island	U.S.E.D.	On Stockton ship canal near Venice Island headquarters at Blakes Landing.	Jan. 1928
Three Mile Slough (S.J.)	D.W.R.	On Sherman Island at R.D. 341 drainage plant. Near junction of slough with San Joaquin River. On pile dolphin.	June 1929
Antioch	D.W.R.	On wharf of Antioch Water Works.	June 1929
		SUISUN BAY	
Benicia	D.W.R.	North side of Suisun Bay. On Benicia Arsenal wharf.	April 1940(2)
		YOLO BY-PASS	
Lisbon	D.W.R.	Left bank of Yolo By-Pass below north end of San Francisco and Sacramento Railroad trestle.	1920
Liberty Island	D.W.R.	Right bank dredger cut separating Little Holland and Liberty Island. 1/2 mile north of Yolo - Solano County Line.	1930
Lindsay Slough	D.W.R.	South bank Lindsay Slough. 1/2 mile west of Wright Cut. At Montezuma Ranch headquarters of California Packing Corporation.	Jan. 1942

(1) D.W.R. - Division of Water Resources; U.S.E.D. - United States Army Engineers; U.S.B.R. - United States Bureau of Reclamation.

(2) Gage originally installed June 1929 and operated until October 1931 by Division of Water Resources. In interim 1931 to April 1940 recorders have been operated here at intervals by U. S. Engineers and U. S. Coast and Geodetic Survey.