

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

o

EARL WARREN, Governor
C. H. PURCELL, Director of Public Works
EDWARD HYATT, State Engineer

R E P O R T O N
W A T E R M A S T E R S E R V I C E
I N
SUSAN RIVER WATERMASTER SERVICE AREA
Lassen County, California
1948 SEASON

Sacramento, California

SUBMISSION TO, AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, Harrison Smitherum, Supervising Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby submit the within contained report entitled "Report on Watermaster Service in Susan River Watermaster Service Area, Lassen County, California, 1948 Season".

Supervising Hydraulic Engineer

I, Gordon Zander, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby approve the within contained report entitled "Report on Watermaster Service in Susan River Watermaster Service Area, Lassen County, California, 1948 Season".

Principal Hydraulic Engineer

I, Edward Hyatt, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, hereby approve and adopt the within contained report entitled "Report on Watermaster Service in Susan River Watermaster Service Area, Lassen County, California, 1948 Season", as a report of the Department of Public Works.

WITNESS my hand and the seal of the Department of Public Works of the State of California, this 18th day of January 1949.

DEPARTMENT OF PUBLIC WORKS

By State Engineer and Chief of the
Division of Water Resources

SEAL

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INTRODUCTION

The Susan River Watermaster Service Area was created by order of the State Engineer on November 10, 1941, in accordance with Sections 4,000 to 4,032, inclusive, of the Water Code of California. The service area as created includes all the water rights set forth in the decree in the case of J. J. Fleming, et al., vs. J. R. Bennett, et al., No. 4573, Superior Court, Lassen County, entered April 18, 1940, with the exception of certain rights excluded in the order, which have been discussed heretofore in the watermaster report for the 1943 season.

Watermaster service, as provided in the aforementioned sections of the Water Code, was commenced for the 1948 season on April 2 and terminated on September 30. C. M. O'Donnell, appointed watermaster by the Department of Public Works for the Susan River Watermaster Service Area, was in charge of distribution during the season under the supervision of L. C. Jopson, Supervising Watermaster.

WATER SUPPLY

Precipitation

The monthly snowfall and precipitation record for the U. S. Weather Bureau station at Susanville Airport for the period October 1947 to September 1948, inclusive, is contained in Table 1. For purposes of comparison, the tabulation also includes the mean monthly snowfall and precipitation for periods of forty-five and fifty years, respectively.

The total precipitation for the 1947-48 season was 8.92 inches or less than one-half of the fifty year mean of 19.07 inches. This comparison of the precipitation records for the 1947-48 season to the fifty year mean is not entirely accurate because the U. S. Weather Bureau station was moved in December, 1946 from within the corporate limits of the City of Susanville to its present location, some 5.5 miles eastwardly, at the Susanville airport.

The weather conditions in the area of the City of Susanville are

subject to wide variation and it is probable that the precipitation at the Susanville airport is generally less than in the City of Susanville.

The California Cooperative Snow Surveys publication of April 1948, indicated that the water content of the snow as observed at three stations in the Susan River watershed on April 1, was only about forty-five per cent of the long time mean.

Stream Flow

Continuous records of stream flows were obtained by the use of automatic water stage recorders for practically the entire period of watermaster service at the following stations:

- (1) Susan River at Haws (below Ramsey ditch)
- (2) Old Channel of Susan River at Stan Brown's
- (3) Susan River at Johnstonville Bridge
- (4) Willow Creek below Belfast Bridge
- (5) Gold Run Creek above all diversions
- (6) A and B canal at Johnstonville

The discharge records for Stations 1 to 5 are contained in Tables 4 to 8, inclusive. The records for the flow in the A and B canal at Johnstonville are not included in this report because the frequent manipulations of diversion dams in the canal resulted in corresponding changes in backwater and in the relationship between water stage and stream flow. The reason for maintaining this station was to have a check on the amount of the diversion into the canal against the release from the mountain reservoirs and to have a record of the discharge into Lake Leavitt during other periods that the canal diversion dams were not in place. During certain periods, the Old Channel station at Stan Brown's was also affected by backwater from a diversion dam.

Table 9, the record of the diversion to Ramsey ditch at the head, was obtained from interpolating between known discharges at various dates of observation. The discharge of Susan River above Ramsey ditch, Table 3, was

compiled from a summation of the diversions to Ramsey ditch and the discharge of the Susan River at Haws, Table 4. The natural flow of Susan River above Ramsey ditch, Table 2 was determined by deducting the flow of released stored water from Hog Flat and McCoy Flat reservoirs and available for re-diversion, Table 10, from the discharge of Susan River above Ramsey ditch.

Hydrographs of Susan River below Ramsey ditch, Gold Run Creek above all diversions and Willow Creek below Belfast bridge are shown for the 1948 irrigation season on the accompanying plat.

Sufficient records of runoff for the Susan River stream system are not available for the computation of satisfactory normals. However, by comparison with the natural flows above Ramsey ditch since 1936, it appears that the stream flow during the 1948 irrigation season was slightly above normal for the 13 year period.

The following table offers a comparison of the natural flows of Susan River above Ramsey ditch since 1936.

NATURAL FLOWS OF SUSAN RIVER ABOVE RAMSEY DITCH

ACRE-FEET

Year	April	May	June	July	Total
1936	11,000	6,310	2,810	606	20,730
1937	13,100	7,660	1,590	416	22,770
1938	(a) 33,900	82,800	21,500	2,940	141,140
1939	(b) 2,070	950	398	171	3,590
1940	(c) 7,250	11,700	1,560	706	21,210
1941	(d) 3,060	26,000	5,240	1,220	35,520
1942	(e) 10,300	18,600	9,160	1,570	40,630 39,630
1943	(f) 5,800	8,890	4,050	1,320	20,060
1944	(g) 7,390	9,240	3,460	1,180	21,270
1945	(h) 5,650	6,030	2,970	978	15,630
1946	(i) 6,880	6,200	1,710	880	15,670
1947	(j) 2,470	2,990	870	236	6,570
1948	(k) 10,900	9,660	7,260	831	28,700 28,650

- (a) 11-day period
- (b) 27-day period
- (c) 10-day period
- (d) 7-day period
- (e) 13-day period
- (f) 11-day period

- (g) 24-day period
- (h) 18-day period
- (i) 16-day period
- (j) 17-day period
- (k) 29-day period

DISTRIBUTION OF WATER

The waters of Susan River and its tributaries were distributed during the 1948 season in accordance with the water rights defined in the judgment and decree in the case of J. J. Fleming, et al., vs. J. R. Bennett, et al., No. 4573, Superior Court, Lassen County, California.

The decree divides the waters of the stream system into three groups,

depending upon the source or sources of supply. Schedule 3 of the decree defines the rights to the use of water from Willow Creek which includes Upper Willow Creek Valley, Lower Willow Creek, and a part of the requirements for the Susan River delta below Colony Dam. Schedule 4 of the decree defines the rights to the use of water from Gold Run Creek, Piute Creek, Hills Creek, Holsclaw Creek and Lassen Creek above their confluence with Susan River. Schedules 5 and 6 of the decree define the rights to Susan River exclusive of the tributaries.

A discussion of water distribution for the 1947-48 season in the three groups in accordance with the schedules follows:

Willow Creek (Schedule 3)

Due to the subnormal precipitation and snowfall within the Susan River drainage basin during the winter months of 1947-48, the stream discharges were extremely low at the beginning of the watermaster service season. At that time, Willow Creek was discharging little more than the flow from the springs above and below Willow Creek Valley. However, intermittent storms, which began during the first week of April and lasted until the second week of June, provided enough runoff, when supplemented by spring flow and Walsh reservoir release, to meet all irrigation requirements until the beginning of haying on about July 1. After that date, the first priority allotments to the Murrer and Walsh ranches were satisfied and stockwater was available to the lower Willow Creek valley users. The springs in lower Willow Creek valley provided almost the entire flow into the Susan River delta after July 5.

Water was impounded in Walsh reservoir to a maximum depth of only 1.95 feet above the concrete floor of the outlet structure at the abutments during the spring of 1948 due to a controversy between Mr. J. R. Barron and the lower users. This matter is discussed in some detail under the heading of "Controversies". Release of the stored water was commenced on May 20 and

continued until about June 20. Due to stockwater requirements above the dam, the reservoir was not completely drained.

Lassen, Gold Run, Hills and Piute Creeks (Schedule 4)

Lassen Creek

The flow of Lassen Creek was adequate to fill all irrigation requirements until the first week of June. Some shortages existed in the second priority allotment after that date and lasted until haying began about June 20. During the remainder of the season the flow became increasingly smaller but stockwater was available at all times on the Hulsman ranch.

Gold Run Creek

The flow of Gold Run Creek was sufficient to meet all irrigation requirements until haying began. After July 15 and until the end of August, there was sufficient water to provide a minor amount of irrigation on the Satoca and Ridenour ranches. During the month of September the entire stream flow was diverted to the Satoca ranches for irrigation of gardens and for stock. Water originating in the stream channel on the Ridenour ranch provided stockwater for the lower users at all times.

Hills Creek

Hills Creek discharge was adequate to satisfy the decreed allotments from about the middle of April until the first week of June. After that time the flow decreased until on August 15, about 0.30 cubic feet per second was available. There after the flow remained nearly constant for the remainder of the season. The allotment to the Emerson Ranch could not be delivered after July 15 due to the heavy percolation losses at the head of the ditch.

The Emerson reservoir came within a few feet of filling by July 1. The Ridenour reservoirs filled early in the year and they were more than one half filled at the end of the season.

After the flow in Hills Creek dropped to 0.30 cubic foot per second there was only enough water to irrigate a garden on the Brugger ranch.

Piute Creek

There was sufficient flow in Piute Creek to meet all requirements until the end of June. After about July 15 the available supply was limited to little more than the constant flow of Bagwill springs. During this latter period it was not possible to completely satisfy some of the lower users. There was a minor return flow available to C. Houghton throughout the entire season, although his allotment was used by terms of the decree by the California-Pacific Utilities Company after July 15.

Susan River (Schedules 5 and 6)

The Susan River discharge, tabulated in Table 2 was adequate, with minor exceptions, to satisfy all irrigation requirements until about June 20. Inasmuch as haying operations began generally about that time, the water supply was satisfactory until about July 20 when haying was finished. During the remainder of the season it was possible to satisfy the first priority allotments of Ramsey ditch and the Old Channel and the stockwater requirements in the River channel. It was not possible to furnish water for stock to the Davis ranch from Bantley dam after August 15, to the Jenkins ranch from the A and B canal for the first 13 days of September and to the Jenkins property at the end of the Davis-Jenkins ditch after July 15.

Prior to July 1, a minimum continuous flow of twenty cubic feet per second of Susan River water was passed to the lower Susan River users. Subsequent to that time the tule area received very little Susan River water and was almost entirely dependent upon the flow of Willow Creek.

During the periods May 4 and 5, and June 10 to 15, with the dis-

discharge into the tule in the order of 130 cubic feet per second, it was necessary to waste some water into Honey Lake. At the same time Whitewater reservoir was at a very low stage and it would have been desirable to divert a large portion of this water to storage. Due to the restrictions in Hartson Slough, which is the diversion channel, it was possible to deliver very little water to the reservoir.

The Woodstock, Bantley, Johnstonville, Ripley, Barham, Shanks and Johnson and Chappius dam were used during the 1948 season.

The average flow of Susan River above Ramsey ditch and the percent of allotments delivered to the first and second priority rights under Schedule 5 are given by months in the following tabulation:

Month	Average Available Natural	Percent of Allotments Delivered	
	Flow of Susan River above Ramsey Ditch c.f.s.	1st Priority	2nd Priority
		* 4.90 c.f.s.	67.55 c.f.s.
April	** 190	100%	100%
May	157	100%	100%
June	122	100%	100%
July	13.5	100%	13%
August	5.94	100%	1%
September	** 4.79	98%	0%

*Does not include 11.05 cubic feet per second allocated to lands upstream from gaging station.
 **29-day periods

Susan River Reservoirs

1948

At the beginning of the season of watermaster service there was very little snow in the mountains, the stream discharges were small and the Lassen Irrigation Company reservoirs were far from being filled. During the ensuing period of intermittent precipitation which lasted for about two months, McCoy Flat and Lake Leavitt reservoirs filled to capacity.

During the 1948 season, Hog Flat reservoir was drained, Lake Leavitt was almost completely drained and McCoy Flat reservoir was drawn down to approximately one-third capacity. A total of 6960 acre feet of stored water released from McCoy and Hog Flat reservoirs between July 20 and August 9 was measured at the gaging station at Haws above Susanville. This was rediversion from the Susan River canal at Johnstonville into Lake Leavitt.

The decree requires that, between March 1 and July 1, a flow in the amount of twenty cubic feet per second of Susan River water shall be passed to the tule users before the Lassen Irrigation Company can begin to impound water. The Susan River discharged a minimum of twenty cubic feet per second into the tule area until July 1 making it unnecessary to require the Lassen Irrigation Company to pass water through McCoy Flat reservoir during the 1948 season.

Colony dam was not used during the 1948 season.

Eagle Lake

1948

Beginning in the 1947 season, measurements were taken from a bench mark to the water surface of Eagle Lake in order to determine the changes in the water surface elevation. These observations were continued during the 1948 season. The elevation of the bench mark from which the measurements were taken, was determined by Mr. W. E. Buell as 98.06 feet above an earlier established datum. The elevation of the water surface at the various times of observation during the 1947 and 1948 season are included in the following tabulation for purposes of comparison.

Date	Distance B.M. to water surface	Elevation of Water Surface	
4/27/47	13.85	84.21	W. R. Gianelli & L. C. Jopson
5/16/47	14.08	83.98	W. E. Buell
8/16/47	15.17	82.89	W. E. Buell
9/11/47	15.75	82.31	W. R. Gianelli
6/3/48	15.17	82.89	L. C. Jopson & C. M. O'Donnell
7/7/48	15.32	82.74	C. M. O'Donnell
7/28/48	15.73	82.33	C. M. O'Donnell
8/26/48	16.12	81.94	C. M. O'Donnell
9/24/48	16.62	81.44	C. M. O'Donnell

SUMMARY

Due to the small snow-pack and the extremely dry winter, the outlook for a successful irrigation season was very poor at the beginning of the watermaster season. This condition was changed completely by a period of intermittent precipitation which lasted from the first week of April to the end of the first week of June. From the precipitation records of Table I, it is seen that the total precipitation for the 1947-48 season was only 8.92 inches or less than one-half of the 50 year mean. However, in excess of one-half of the entire year's precipitation occurred between April 1 and June 5. With the rains coming during the irrigation season and in a relative short period, the irrigation requirements were reduced and the runoff was large. The crops in the valley generally were better than the normal yield.

After haying, a limited amount of irrigation water was available in favored localities. Stock water was delivered with some difficulty late in the season.

CONTROVERSIES

One controversy was settled and two controversies arose during the 1948 season in the Susan River Watermaster Service Area.

In the 1947 Watermaster report, mention was made of a controversy involving Delta Barham and Martin Wright which concerned the return flow from upstream irrigators. In this case the Superior Court of Lassen County rules in favor of the defendant, Martin Wright. The State Watermaster and the Division of Water Resources were not involved in the dispute.

A controversy of several years standing involving Leonard Dozier and the users on Fish Slough was brought to the attention of the Watermaster during the 1948 season. During certain periods in the spring of the year, water in excess of the decreed allotments is available in the Susan River at the head of Woodstock ditch through which diversion is made. It has been

the practice, to divert a portion of this excess water into the ditch and slough but due to channel restrictions in the slough a part of the Dozier ranch becomes inundated during these periods. A lesser amount of the ranch is subject to inundation during periods of full decreed allotment flow in the slough on occasions when only one user is irrigating. Late in the 1948 season, Mr. Dozier complained to the Watermaster against the practice of inundating the land during periods of excess flow in the river. Upon informing one of the other parties to the controversy of Mr. Dozier's complaint, the Watermaster was told that a right to flood a part of the Dozier ranch had been established by past practice. One other user stated that if assessments levied among the various users can be collected and equipment is available the channel restrictions will be removed before the next irrigation season. The Watermaster informed the parties concerned that in the event of future inundations which are objectionable to Mr. Dozier, the flow in the ditch would be limited to the decreed allotment.

The second controversy which arose during the 1948 season concerned the limit of inundation and the amount of water that can legally be impounded in Walsh reservoir and involved Mr. J. R. Barron and the tule ranchers. Upon the purchase of the Walsh ranch in 1947, Mr. Barron became a party to a contract with the tule ranchers which permits the storage of water behind the Walsh dam and upon the Walsh ranch. The contract specifies certain limits as to inundation and period of storage. Mr. Barron has sought through negotiation with the tule ranchers and by request to the Division of Water Resources to eliminate the reservoir in order that the inundated lands can be farmed. The main point of disagreement involves the legal interpretation of the contract regarding the limit of the area of inundation. The contract specifies that the limit of inundation shall be the eastwardly boundary of the hay meadow field. From Mr. Barron's point of view no storage should be permitted above an elevation at which the water surface is at the lowest

point along the fence line of the field concerned. The tule ranchers are not in agreement among themselves but the consensus seems to be that storage should be permitted to an elevation which is the general elevation of the ground at the fence line. Some of the tule people further argue that the Walshs apparently interpreted the elevation of the maximum water surface to be the general ground elevation at the fence line since storage in the past was permitted to that elevation.

In order to obtain data which may be of value in arriving at some mutually agreeable settlement, L. C. Jopson, Supervising Watermaster, and C. M. O'Donnell made determinations of the reservoir area and capacity at the maximum stage and at the end of the period of release.

At the end of the Watermaster season no settlement of the controversy had been reached.

OWNERSHIP OF LANDS AND WATER RIGHTS
WITHIN SUSAN RIVER WATERMASTER SERVICE AREA

Changes of Ownership

The following tabulation lists the changes in ownership of lands and water rights occurring in the Susan River Watermaster Service Area subsequent to the filing of the statement for said service area for 1948. These changes shall be included in the statement of this service area for 1949.

WATER RIGHT OWNERSHIP CHANGES FOR 1949

: Tract Number :	: Name of Water Right Owner Appearing in 1948 Statement :	: Name of Water Right Owner to Appear in 1949 Statement :	: Amount of Water c.f.s. :
: 12-47 :	: Bantley, Albert Leo and Bantley, Alice M. :	: Soule, Dale and Soule, Audrey :	: 1.09 :
: 12-43 :	: Burch, Marble :	: Adams, Irvin L. and Adams, Gladys M. :	: 0.14 :
: 12-112 :	: Capezzoli, John; Capezzoli, Dorothy; DeWitt, W. H.; and DeWitt, Josephine C. :	: Capezzoli, John; Capezzoli, Dorothy; DeWitt, Josephine C.; and DeWitt, Estate of W. H. :	: 7.50 :
: 12-110 :	: DeWitt, W. H. and DeWitt, Josephine C. :	: DeWitt, Josephine C. and DeWitt, Estate of W. H. :	: 1.75 :
: 12-47 :	: Evans, Charles :	: Soule, Dale and Soule, Audrey :	: 0.10 :
: 12-17 :	: Houghton, Cyril C. and Houghton, Eleanora :	: Houghton, Cyril C. and Houghton, Eleanora :	: 0.03 :
: 12-17 :	: Houghton, Cyril C. and Houghton, Eleanora :	: City of Susanville :	: 0.11 :
: 12-108 :	: Humphrey, Estate of J. L. :	: Independent Ice Cream and Creamery Company :	: 5.45 :
: 12-69 :	: Van Dyke, Ruth M. :	: Brugger, Robert :	: 0.40 :

TABLE 1

PRECIPITATION AND SNOWFALL AT SUSANVILLE AIRPORT
SUSANVILLE, CALIFORNIA
ELEVATION 4,155 FEET

Record of monthly snowfall and precipitation for the seasonal
year 1947-48 and a comparison with the forty-five and fifty
year means, respectively.

	Precipitation		1947-48		Snowfall in Inches	
	50 Year Mean	Percent of	Inches	Percent of	45 Year	1947-48
	Inches	Total Mean	Inches	Total Mean	Means	1947-48
October	1.02	5.3	1.57	8.2	0.6	0
November	2.09	11.0	0.07	0.4	2.1	T
December	3.09	16.2	0.15	0.8	13.5	0.6
January	3.81	20.0	0.91	4.8	23.3	0
February	2.90	15.2	0.66	3.5	12.5	9.0
March	2.50	13.1	0.85	4.4	8.4	4.4
April	1.12	5.9	1.85	9.7	1.5	7.5
May	1.07	5.6	1.39	7.3	0.5	0
June	0.58	3.0	1.43	7.5	T	0
July	0.19	1.0	0	0	0	0
August	0.16	.8	0	0	0	0
September	0.54	2.8	.04	0.2	0	0
	19.07	100.0	8.92	46.8	62.4	21.5

Lower case

TABLE 2

DAILY DISCHARGE IN CUBIC FEET PER SECOND
 NATURAL FLOW OF SUSAN RIVER ABOVE RAMSEY DITCH
 APRIL 2 TO SEPTEMBER 29, 1948

7
 9
 2

(Excluding Released Storage Water)

Day	April	May	June	July	August	September
1		168	129	28	7.5	4.1
2	110	160	122	26	7.4	4.1
3	96	164	122	23	7.3	4.1
4	72	181	140	21	7.3	4.1
5	71	186	198	20	7.2	4.3
6	71	190	182	20	7.1	4.3
7	65	193	144	19	7.1	4.1
8	60	174	156	19	7.0	3.9
9	146	162	170	17	7.0	3.8
10	160	153	166	16	6.9	4.0
11	122	141	185	16	6.9	4.0
12	117	141	215	15	6.8	4.2
13	114	153	215	14	6.7	4.2
14	234	141	164	14	6.7	4.5
15	358	145	143	13	6.6	4.6
16	304	155	136	13	6.5	4.8
17	490	165	123	12	6.5	4.8
18	340	174	117	10.0	6.4	5.0
19	268	154	116	8.8	6.4	5.2
20	250	152	104	8.1	6.3	5.4
21	250	143	98	8.1	5.1	5.4
22	234	139	88	8.0	5.1	5.4
23	234	136	76	8.0	4.9	5.6
24	217	161	67	7.9	4.8	5.6
25	201	164	60	7.9	4.6	5.8
26	179	164	55	7.8	4.3	5.8
27	179	154	51	7.7	4.0	6.0
28	179	136	47	7.7	3.9	6.0
29	179	127	41	7.6	3.8	6.0
30	179	152	32	7.6	3.8	
31		143		7.5	3.8	
Total	*5479	4871	3662	418.7	185.7	* 139.1
Mean	*188.9	157.1	122.1	13.5	5.99	* 4.80
Runoff in Ac.Ft.	*10868	9662	7264	830.5	368.3	*275.9

* 29-Day Periods

Total Acre-Feet for period 29200

TABLE 3

DAILY DISCHARGE IN CUBIC FEET PER SECOND
SUSAN RIVER ABOVE RAMSEY DITCH INCLUDING WATER
RELEASED FROM STORAGE
APRIL 2 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		168	129	28	187	4.1
2	110	160	122	26	181	4.1
3	96	164	122	23	175	4.1
4	72	181	140	21	175	4.1
5	71	186	198	20	181	4.3
6	71	190	182	20	181	4.3
7	65	193	144	19	187	4.1
8	60	174	156	19	187	3.9
9	146	162	170	17	187	3.8
10	160	153	166	16	96	4.0
11	122	141	185	16	26	4.0
12	117	141	215	15	16	4.2
13	114	153	215	14	12	4.2
14	234	141	164	14	11	4.5
15	358	145	143	13	9.6	4.6
16	304	155	136	13	7.3	4.8
17	490	165	123	12	7.4	4.8
18	340	174	117	10	6.8	5.0
19	268	154	116	8.8	6.5	5.2
20	250	152	104	8.1	6.3	5.4
21	250	143	98	32	5.1	5.4
22	234	139	88	149	5.1	5.4
23	234	136	76	161	4.9	5.6
24	217	161	67	178	4.8	5.6
25	201	164	60	195	4.6	5.8
26	179	164	55	193	4.3	5.8
27	179	154	51	196	4.0	6.0
28	179	136	47	196	3.9	6.0
29	179	127	41	196	3.8	6.0
30	179	152	32	196	3.8	
31		143		193	3.8	
Total	*5479	4871	3662	2218	1894	*139.1
Mean	*188.9	157.1	122.1	71.5	61.1	*4.80
Runoff						
in Ac.Ft.	*10868	9662	7264	4399	3757	*275.9

* 29-Day Periods

Total Acre-Feet for period 36300

TABLE 4

DAILY DISCHARGE IN CUBIC FEET PER SECOND
SUSAN RIVER BELOW RAMSEY DITCH INCLUDING WATER
RELEASED FROM STORAGE
APRIL 2 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		168	124	25	185	2.7
2	108	160	117	23	179	2.7
3	94	164	117	20	173	2.7
4	70	181	135	18	173	2.7
5	69	186	193	17	179	2.8
6	69	190	176	17	179	2.8
7	63	193	138	16	185	2.7
8	58	168	150	16	185	2.6
9	146	156	164	14	185	2.5
10	160	147	160	13	94	2.6
11	122	135	179	13	24	2.6
12	117	135	209	12	14	2.7
13	114	147	209	11	10	2.7
14	234	135	158	11	8.1	2.9
15	358	139	137	10	7.0	3.0
16	304	149	130	10	5.0	3.1
17	490	159	117	8.7	5.0	3.1
18	340	168	111	6.6	4.2	3.2
19	268	149	110	5.8	4.2	3.3
20	250	147	98	5.7	4.0	3.4
21	250	138	92	30	3.6	3.4
22	234	134	82	147	3.6	3.4
23	234	131	70	159	3.4	3.5
24	217	156	61	176	3.3	3.5
25	201	159	54	193	3.1	3.6
26	179	159	50	190	2.8	3.6
27	179	149	46	193	2.7	3.7
28	179	131	42	193	2.6	3.7
29	179	122	36	193	2.5	3.7
30	179	147	27	193	2.5	
31		138		190	2.5	
**						
Total	*5465	4740	3492	2129.8	1835.1	*88.9
Mean	* 188	153	116	68.7	59.2	*3.07
Runoff						
in Ac. Ft.	*10840	9402	6926	4224	3640	176

* 29-Day Periods

**Gage Heights from Automatic Water Stage Recorder

Total Acre-Feet for Period 35200

TABLE 5

DAILY DISCHARGE IN CUBIC FEET PER SECOND
 OLD CHANNEL SUSAN RIVER BELOW WOODSTOCK DAM
 APRIL 2 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		21	17	7.0	2.7	2.5
2	16	21	17	6.4	2.8	2.6
3	17	20	17	5.9	2.8	2.6
4	17	21	21	5.6	2.7	2.5
5	16	21	20	5.6	2.7	2.6
6	17	26	21	5.2	2.7	2.5
7	15	31	20	4.8	2.7	2.5
8	14	27	20	4.8	2.8	2.5
9	17	24	21	4.5	2.8	2.4
10	15	23	21	4.4	2.9	2.5
11	14	19	20	4.0	3.0	2.5
12	15	20	19	4.2	3.0	2.5
13	18	20	19	3.9	3.1	2.5
14	18	21	18	3.7	3.3	2.6
15	18	20	18	3.7	3.5	2.6
16	19	24	18	3.6	3.6	2.6
17	20	25	18	3.3	3.6	2.5
18	20	26	18	3.3	3.5	2.5
19	16	23	18	2.9	3.5	2.5
20	11	20	18	3.0	3.5	2.6
21	11	20	18	3.0	3.5	2.6
22	18	21	18	2.9	3.3	2.6
23	19	21	17	2.9	3.3	2.7
24	16	20	15	2.9	3.0	2.7
25	11	20	14	3.0	3.0	2.5
26	11	17	12	2.9	2.8	2.5
27	11	14	11	2.8	2.7	2.7
28	20	16	11	2.8	2.6	2.7
29	22	16	9.5	2.7	2.5	2.8
30	21	17	7.3	2.7	2.5	
31		18		2.7	2.5	
Total**:	473	652	512	121.1	92.9	*74.4
Mean	16.3	21.1	17.1	3.91	3.00	*2.58
Runoff in ac.ft.:	938.8	1294.6	1016.5	240.2	184.3	*147.6

* 29-Day Periods

**Discharge Occasionally affected by backwater

Total Acre-Feet for period 3860

TABLE 6

DAILY DISCHARGE IN CUBIC FEET PER SECOND
 SUSAN RIVER AT JOHNSTONVILLE
 APRIL 3 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		77	36	15	0.9	0.8
2		73	34	12	0.9	0.8
3	53	79	40	10	1.0	0.9
4	44	77	40	10	1.0	0.9
5	41	77	58	9.5	1.0	0.8
6	40	63	49	9.5	1.1	1.0
7	35	77	26	9.8	1.1	1.1
8	43	37	27	10	1.1	0.9
9	44	33	57	9.3	1.1	0.9
10	33	23	57	8.2	1.0	1.0
11	31	23	97	7.8	1.0	0.9
12	38	33	128	7.1	0.9	1.1
13	44	40	135	4.8	0.9	1.0
14	63	40	94	0.9	0.9	1.0
15	68	43	64	0.9	1.0	0.9
16	50	63	43	1.0	1.0	0.9
17	250	58	36	0.9	1.0	1.0
18	68	52	35	0.8	1.0	1.1
19	53	31	34	0.8	1.0	1.1
20	55	31	27	3.7	1.0	1.3
21	55	37	25	3.0	1.0	1.4
22	58	47	26	3.7	1.0	1.2
23	55	55	26	2.8	1.0	1.0
24	47	57	27	2.2	0.9	1.0
25	58	63	25	2.4	0.9	1.0
26	73	68	27	2.2	0.8	1.5
27	80	52	22	1.2	0.8	2.4
28	92	37	21	1.1	0.9	2.4
29	105	33	20	1.1	0.9	2.6
30	77	45	19	1.1	0.7	
31		52		1.0	0.7	
Total	*1753	1576	1355	153.8	28.5	**34.0
Mean	* 62.6	50.8	45.2	5.00	.91	** 1.20
Runoff in Ac.Ft.	* 3480	3130	2690	307	59.5	** 69.0

* 25-Day Period

**29-Day Period

Total Acre-Feet for period 9740

TABLE 7

DAILY DISCHARGE IN CUBIC FEET PER SECOND
 WILLOW CREEK BELOW BELFAST BRIDGE ON OLD NETT RANCH
 APRIL 3 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		18	29	12	10.2	11.4
2		17	27	12	10.4	11.8
3	15	16	25	12	10.4	12.0
4	16	16	23	12	10.8	12.2
5	18	16	24	12	11.4	12.5
6	19	16	27	12	11.8	12.8
7	21	15	30	12	12.0	12.5
8	18	17	29	12	12.0	12.2
9	17	17	29	12	12.0	12.2
10	18	16	28	12	12.0	12.0
11	17	15	23	12	11.8	11.4
12	18	18	22	11	11.8	11.4
13	19	18	21	11	11.8	11.1
14	21	18	20	11	12.2	10.8
15	24	18	19	11	12.2	10.2
16	26	18	19	11	12.2	10.2
17	28	18	17	11	12.2	10.0
18	27	19	16	10	12.0	9.6
19	24	21	16	10	12.0	10.6
20	23	24	17	10	11.8	10.8
21	23	25	13	10	11.4	10.8
22	25	25	13	9.6	11.0	10.8
23	25	25	13	9.4	10.8	10.8
24	24	27	13	9.4	10.8	10.9
25	22	26	12	9.4	10.4	10.5
26	21	25	12	9.4	10.8	10.2
27	19	24	12	9.6	10.8	9.6
28	18	25	12	9.6	10.4	9.2
29	18	27	12	9.6	11.1	9.2
30	18	28	12	10	11.1	9.0
31		32		10	11.4	
Total	*586	644	592	335	353.0	**318.9
Mean	*20.9	20.8	19.7	10.8	11.4	**11.0
Runoff in:						
Ac. Ft.	*1163	1279	1175	666	700	**633

* 28-Day Period

**29-Day Period

Total Acre-Feet for period 5580

TABLE 8

DAILY DISCHARGE IN CUBIC FEET PER SECOND
 GOLD LUN CREEK ABOVE DIVERSIONS
 APRIL 16 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		16	38	7.8	.90	.30
2		16	43	7.3	.90	.30
3	NO	21	47	7.3	.90	.25
4		32	46	6.9	.85	.25
5		40	43	6.4	.85	.25
6		48	43	6.1	.80	.25
7		51	41	6.1	.75	.25
8	RECORD	27	47	5.8	.75	.25
9		24	46	5.2	.70	.25
10		24	41	4.9	.80	.25
11		27	35	4.3	.80	.25
12		31	22	3.9	.65	.25
13		41	20	3.6	.65	.25
14		35	20	3.1	.60	.25
15		40	20	2.8	.55	.25
16	43	45	20	2.6	.50	.25
17	62	40	20	2.3	.50	.30
18	41	31	20	2.1	.50	.30
19	37	24	18	1.5	.50	.30
20	41	24	15	1.5	.50	.30
21	34	23	14	1.3	.50	.35
22	23	29	13	1.3	.50	.35
23	19	35	13	1.3	.50	.35
24	19	43	12	1.3	.50	.40
25	27	47	11	1.1	.50	.40
26	26	54	11	1.1	.50	.50
27	22	47	10	1.1	.50	.50
28	21	38	9.6	1.0	.40	.55
29	20	35	8.8	1.0	.40	.60
30	18	33	8.0	0.90	.40	
31		35		0.85	.40	
Total	*453	1055	755.4	103.75	19.05	**9.30
Mean	*30.2	34.0	25.2	3.35	0.61	**0.32
Runoff						
in Ac.Ft.	*898.5	2093	1498	205.8	37.8	**18.4

* 15-Day Period

**29-Day Period

Total Acre-Feet for period 4750

TABLE 9

DAILY DISCHARGE IN CUBIC FEET PER SECOND
RAMSEY DITCH AT HEAD
APRIL 2 TO SEPTEMBER 29, 1948

Day	April	May	June	July	August	September
1		0.4	5.3	3.5	2.3	1.4
2	2.10	0.4	5.3	3.5	2.3	1.4
3	2.1	0.4	5.3	3.5	2.3	1.4
4	2.1	0.4	5.3	3.5	2.3	1.4
5	2.1	1.0	5.3	3.4	2.3	1.5
6	2.1	1.0	5.7	3.5	2.1	1.5
7	2.1	1.0	5.7	3.3	2.1	1.4
8	2.1	6.0	5.7	3.3	2.1	1.3
9	0.5	6.0	5.7	3.3	2.1	1.3
10	0.5	6.0	5.7	3.3	2.1	1.4
11	0.5	6.0	5.7	3.3	2.1	1.4
12	0.5	6.0	5.7	3.5	2.1	1.5
13	0.3	6.0	6.0	3.5	2.6	1.5
14	0.3	6.0	6.0	3.5	2.6	1.6
15	0.3	5.6	6.0	3.5	2.6	1.6
16	0.3	5.6	6.0	3.5	2.3	1.7
17	0.5	5.6	6.0	3.0	2.4	1.7
18	0.5	5.6	6.3	3.0	2.4	1.8
19	0.5	4.8	6.3	3.0	2.3	1.9
20	0.5	4.8	6.3	2.4	2.3	2.0
21	0.5	4.8	6.3	2.4	1.5	2.0
22	0.7	4.8	6.3	2.4	1.5	2.0
23	0.7	4.8	6.0	2.4	1.5	2.1
24	0.7	4.6	6.0	2.4	1.5	2.1
25	0.7	4.6	6.0	2.4	1.5	2.2
26	0.3	4.6	4.9	2.6	1.5	2.2
27	0.3	4.6	4.9	2.6	1.3	2.3
28	0.3	4.8*	4.9	2.6	1.3	2.3
29	0.3	4.8	4.9	2.6	1.3	2.3
30	0.3	4.8	4.9	2.6		
31		4.9				

Total	*24.7	130.7	164.4	94.0	61.2	*51.0
Mean	*0.82	4.2	5.5	3.0	2.0	*1.8
Runoff						
in Ac.Ft.	*49.0	279	326	186	121	*101

*29-Day Periods

***Discharge Estimated from Occasional Gage Height Readings

Total Acre-Feet for period - 1060

TABLE 10

 DAILY DISCHARGE IN CUBIC FEET PER SECOND
 WATER RELEASED FROM MCCOY AND HOG FLAT RESERVOIRS
 AND AVAILABLE FOR RE-DIVERSION AT SUSANVILLE
 JULY 20 TO AUGUST 19, 1948

Day	April	May	June	July	August	September
1					180	
2					174	
3					168	
4					168	
5					174	
6		NO			174	
7					180	
8		RELEASE		NO	180	
9					180	
10					89	
11					19	
12					9	
13	NO		NO	RELEASE	5	NO
14					4	
15					3	
16					1	
17					1	
18	RELEASE		RELEASE		1	RELEASE
19					0	
20				0		
21				24		
22				141		
23				153		
24				170		
25				187		
26				184		
27				188	NO	
28				188		
29				188	RELEASE	
30				188		
31				186		
Total				*1797	**1710	
Mean				* 180	**95.0	
Runoff in Ac.Ft.				*3560	**3400	

* 11-Day Period

** 18-Day Period

*** Discharge determined from change in stream flow at Haws. Actual period of release July 20 to August 9

Total Acre-Foot for Period - 6960

