

D. W. KELLEY & Associates

aquatic biology

INVESTIGATIONS OF SALMON AND STEELHEAD
IN LAGUNITAS CREEK,
MARIN COUNTY, CALIFORNIA

VOLUME II.

RECOMMENDATIONS FOR MANAGING INSTREAM
FLOWS AND STREAMBED CHARACTERISTICS

Prepared for the
Marin Municipal Water District
Corte Madera, California

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TABLE OF CONTENTS

PAGE

iii

List of Tables

CHAPTER 1 - INTRODUCTION

1

CHAPTER 2 - INSTREAM FLOW RECOMMENDATIONS

3

WET AND DRY YEAR CRITERIA

3

ADULT UPSTREAM MIGRATION

8

SPAWNING FLOWS

10

EMBRYO INCUBATION

10

JUVENILE REARING

10

SPRING JUVENILE REARING AND EMIGRATION

12

CHAPTER 3 - OPERATION STUDY RESULTS

13

PROTECTION OF LAGUNITAS CREEK INSTREAM FLOWS

14

RELEASES FROM NICASIO RESERVOIR

49

THE CALIFORNIA FRESHWATER SHRIMP (Syncaris pacifica)

49

CHAPTER 4 - STREAMBED STANDARDS

51

PHASES OF LIFE CYCLE AFFECTED BY STREAMBED COMPOSITION

51

Spawning--The Need for Gravel

51

Incubation

51

Fry Emergence

52

Juvenile Rearing--Steelhead

52

Juvenile Rearing--Salmon

52

DEVELOPMENT OF STREAMBED STANDARDS

53

Average Cobble Embeddedness

53

Percentage of Streambed Area Covered with Cobble and

Boulders

53

Area in Spawning Glides Covered with Gravel

55

Average Percent Composition of Fines in Nests

55

Annual Monitoring of Streambed Conditions

55

TABLE OF CONTENTS (continued)

	PAGE
CHAPTER 5 - DISCUSSION AND RECOMMENDATIONS	56
RECOMMENDATIONS	57
CITATIONS	59

LIST OF TABLES

TABLE		PAGE
1	Recommended minimum instream flow schedules for coho salmon and steelhead trout in Lagunitas Creek.	4
2	Lower limits of reservoir storage criteria used for adjusting instream flows in Lagunitas Creek.	9
3	Percentage of months in the 30-year period (1955-1984) when instream releases were in the named category.	9
4	Estimated mean daily flows at the SPTSP gage in Lagunitas Creek without any dams on the creek, with the original Kent Dam and release requirements, and with the enlarged Kent Dam and recommended minimum flow schedules in operation.	15
5	Total acre-feet of water spilled over and released above Shafter Bridge each month in the operation study plan 7.	45
6	Criteria for evaluation of the effects of flow on salmon and steelhead in Lagunitas Creek.	46
7	Evaluation of the quality of the instream flows in Lagunitas Creek that would have occurred in the 30-year period between 1955 and 1984 had the enlarged Kent Dam been in place and operated according to rules of Table 1.	47
8	Mean monthly flows (cfs) measured by the USGS at the Samuel P. Taylor gage and at the Pt. Reyes gage in Lagunitas Creek 1985-1986 and 1986-1987.	48
9	Proposed streambed standards for salmonids in Lagunitas Creek.	54

CHAPTER 1 - INTRODUCTION

This Volume II report describes efforts to use our understanding of biological and geomorphological conditions in Lagunitas Creek reported in Volume I (Bratovich and Kelley 1988), and a reservoir operations model of the Marin Municipal Water District (MMWD) water system to define the best possible instream flow regime for Lagunitas Creek, Marin County. Our goal is to maximize salmon and steelhead production in a way that is compatible with other natural resources and the need of MMWD to supply domestic water.

The results of our studies reported in Volume I were used to define a preliminary set of minimum flows that appears necessary for each portion of the salmon and steelhead life cycles. Those preliminary minimum flows, below which the stream should not be allowed to fall, were included in a reservoir operation study as a demand on the project. Running the reservoir operation model for a 30-year period (1955-1984) identified the years when meeting such requirements would have been relatively easy or when it would have been difficult or impossible even with mandatory conservation of diverted water in dry years. Through a series of model runs, biologists Paul Bratovich and Don Kelley and MMWD hydrologist Dana Roxon developed a flow regimen aimed at providing the best possible instream flow for fish consistent with MMWD water supply requirements.

Chapter 2 describes the minimum flow schedule or operating rules selected to accomplish this. Chapter 3 is a description of the operation study results, i.e., the instream flows which the fish would have experienced if the project had been operated during the period from 1955 to 1984. It includes tables of mean monthly water flows that would have been released to protect the stream under this schedule and daily flows that would have resulted in Lagunitas Creek downstream.

Chapter 4 addresses the need to prevent streambed conditions from deteriorating. Our previous work and that of Hecht et al. (1979; 1980; 1981; and 1983) led to the conclusion that salmon and steelhead production in Lagunitas Creek is dependent upon streambed conditions just as much as it is upon streamflow. Upstream watershed and bank erosion and deposition of sand in the stream creates a soft streambed which permits excessive scour at even moderately high flows. In many winters this scour has killed most of the salmon and many of the steelhead embryos incubating in the Lagunitas Creek gravel. Chapter 4 also describes Hecht's prediction that the enlarged Kent Dam, while reducing scour, is likely to permit the accumulation of sand. This would reduce spawning and rearing habitat and reduce the effectiveness of instream flows. We suggest a sediment management program to prevent this from happening.

Chapter 5 summarizes our recommendations for instream flows, for sediment management, and for other actions which we believe are important to restore the salmon and steelhead resources of Lagunitas Creek to a permanently healthy condition.

CHAPTER 2 - INSTREAM FLOW RECOMMENDATIONS

Table 1 lists our recommended minimum instream flow schedules for each life history stage of salmon and steelhead in Lagunitas Creek. There are separate schedules for wet, normal, below normal, and dry year conditions. This chapter summarizes the basis for these recommendations. Additional details can be found in Volume 1.

WET AND DRY YEAR CRITERIA

Over the years, the instream flow requirements on many California streams have included dry or critical year reductions. Since the competition between in- and out-of-stream use is greatest in dry and critical years, such reductions have made it possible for the State Water Resources Control Board (SWRCB) to impose conditions that provide larger instream flows in wetter years without reducing the safe yield of the reservoirs below acceptable levels. Such dry and critical year reductions have generally been implemented when rainfall in the watershed or runoff into the reservoirs by a certain date (or dates) has been less than the normal amount.

Numerous runs of the MMWD Reservoirs model demonstrated that the system could provide better instream flows if wet, normal, below normal, and dry flow schedules could be based upon end of month reviews of the amount of water stored in all the Lagunitas Creek watershed reservoirs instead of on previous rainfall or runoff.

A valid objection to using reservoir storage levels for this purpose is that should the District divert more Lagunitas Basin water than was diverted in the model operation study, reservoir storage would sometimes be lower than that described in the study. Because they are tied to reservoir storage, instream flow requirements would be lower during those periods. The District is attempting to avoid increasing diversion by voluntary and mandatory water conservation, a search for out-of-basin supplies, and by declaring protection of the Lagunitas Creek environment and fishery a project purpose--but public desire for more water will likely always be strong. The District's consulting attorney, Tom Thorner, has suggested that the objection to basing dry year reductions on reservoir storage could be satisfied by agreement that, should the District divert more Lagunitas basin water than specified in the operation study (34,000 acre-feet per water year), the additional water would be added to the actual end-of-month storage levels and the sum of the two be used to determine instream flow requirements. The language of such a condition has not been developed but the idea appears sound.

Table 1. Recommended minimum instream flow schedules for coho salmon and steelhead trout in Lagunitas Creek.
SPTSP gage refers to the USGS gage in Samuel P. Taylor State Park.

WET CONDITION

STEP	SPECIES	LIFE STAGE	TIME PERIOD	FLOW
1	Coho salmon	ATTRACTION, PASSAGE FLOWS	NOV 01-DEC 31	a) Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".
			DEC 01	b) If no "trigger" has occurred, then release enough water into Lagunitas Creek above Shafter Bridge to provide 35 cfs for 3 days at the SPTSP gage.
2	Steelhead trout	ATTRACTION, PASSAGE FLOWS	JAN 01-FEB 28	a) Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".
			FEB 01	b) If no "trigger" has occurred, then release enough water into Lagunitas Creek above Shafter Bridge to provide 35 cfs for 3 days at the SPTSP gage.
3	Coho salmon Steelhead trout	SPAWNING, INCUBATION, SPRING REARING, EMIGRATION	NOV 01-APR 30	Immediately following the first occurrence of either a "trigger" flow or release specified in Step 1, maintain a base winter flow of 16 cfs at the SPTSP gage. No more than 14 cfs need be released to meet this requirement.
4	Coho salmon Steelhead trout	SPRING REARING, EMIGRATION	MAY 01-JUN 15	Maintain a flow of 12 cfs at the SPTSP gage.
5	Coho salmon Steelhead trout	LATE EMIGRATION, SUMMER REARING	JUN 16-NOV 01	Maintain a flow of 8 cfs at the SPTSP gage. Continue flow maintenance until either a "trigger" or release occurs as specified in Step 1.

Table 1 (continued). Recommended instream flow schedules for coho salmon and steelhead trout in Lagunitas Creek.

NORMAL CONDITION

STEP	SPECIES	LIFE STAGE	TIME PERIOD	FLOW
1	Coho salmon	ATTRACTION, PASSAGE FLOWS	NOV 01-DEC 31	a) Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".
			DEC 15	b) If no "trigger" has occurred, then release enough water into Lagunitas Creek above Shafter Bridge to provide 35 cfs for 3 days at the SPTSP gage.
2	Steelhead trout	ATTRACTION, PASSAGE FLOWS	JAN 01-FEB 28	a) Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".
			FEB 15	b) If no "trigger" has occurred, then release enough water into Lagunitas Creek above Shafter Bridge to provide 35 cfs for 3 days at the SPTSP gage.
3	Coho salmon Steelhead trout	SPAWNING, INCUBATION, SPRING REARING, EMIGRATION	NOV 01-APR 30	Immediately following the first occurrence of either a "trigger" flow or release specified in Step 1, maintain a base winter flow of 14 cfs at the SPTSP gage. No more than 12 cfs need be released to meet this requirement.
4	Coho salmon Steelhead trout	SPRING REARING, EMIGRATION	MAY 01-JUN 15	Maintain a flow of 10 cfs at the SPTSP gage.
5	Coho salmon Steelhead trout	LATE EMIGRATION, SUMMER REARING	JUN 16-NOV 01	Maintain a flow of 6 cfs at the SPTSP gage. Continue flow maintenance until either a "trigger" or release occurs as specified in Step 1.

Table 1 (continued). Recommended instream flow schedules for coho salmon and steelhead trout in Lagunitas Creek.

BELOW NORMAL CONDITION

STEP	SPECIES	LIFE STAGE	TIME PERIOD	FLOW
1	Coho salmon	ATTRACTION, PASSAGE FLOWS	NOV 01-DEC 31	a) <u>Only a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".</u>
			DEC 31	b) If no "trigger" has occurred, then <u>release</u> enough water into Lagunitas Creek above Shafter Bridge to provide <u>35 cfs</u> for 3 days at the SPTSP gage.
2	Steelhead trout	ATTRACTION, PASSAGE FLOWS	JAN 01-FEB 28	a) <u>Only a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, maintain 35 cfs for 3 days at the SPTSP gage. Repeat after each "trigger".</u>
			FEB 28	b) If no "trigger" has occurred, then <u>release</u> enough water into Lagunitas Creek above Shafter Bridge to provide <u>35 cfs</u> for 3 days at the SPTSP gage.
3	Coho salmon Steelhead trout	SPAWNING, INCUBATION, SPRING REARING, EMIGRATION	NOV 01-MAR 31	Immediately following the first occurrence of either a "trigger" flow or release specified in Step 1, <u>maintain</u> a base winter flow of <u>12 cfs</u> at the SPTSP gage. No more than <u>10 cfs</u> need be released to meet this requirement.
4	Coho salmon Steelhead trout	SPRING REARING, EMIGRATION	APR 01-MAY 31	<u>Maintain</u> a flow of <u>8 cfs</u> at the SPTSP gage.
5	Coho salmon Steelhead trout	LATE EMIGRATION, SUMMER REARING	JUN 01-NOV 01	<u>Maintain</u> a flow of <u>5 cfs</u> at the SPTSP gage. Continue flow maintenance until either a "trigger" or release occurs as specified in Step 1.

Table 1 (continued). Recommended instream flow schedules for coho salmon and steelhead trout in Lagunitas Creek.

DRY CONDITION*

STEP	SPECIES	LIFE STAGE	TIME PERIOD	FLOW
1	Coho salmon	ATTRACTION, PASSAGE FLOWS	NOV 01-DEC 31	Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, <u>maintain 35 cfs</u> for 3 days at the SPTSP gage. Repeat after each "trigger".
2	Steelhead trout	ATTRACTION, PASSAGE FLOWS	JAN 01-FEB 28	Once a 25 cfs mean daily "trigger" occurs at the USGS gage near Pt. Reyes Station, <u>maintain 35 cfs</u> for 3 days at the SPTSP gage. Repeat after each "trigger".
3	Coho salmon Steelhead trout	SPAWNING, INCUBATION, SPRING REARING, EMIGRATION	NOV 01-MAR 31	Immediately following the first occurrence of a "trigger" flow, <u>maintain</u> a base winter flow of <u>10 cfs</u> at the SPTSP gage. No more than <u>8 cfs</u> need be released to meet this requirement.
4	Coho salmon Steelhead trout	SPRING REARING, EMIGRATION	APR 01-MAY 31	<u>Maintain</u> a flow of <u>6 cfs</u> at the SPTSP gage.
5	Coho salmon Steelhead trout	LATE EMIGRATION, SUMMER REARING	JUN 01-NOV 01	<u>Maintain</u> a flow of <u>4 cfs</u> at the SPTSP gage. Continue flow maintenance until either a "trigger" or release occurs as specified in Step 1.

*During critical, drought emergency years releases will be as determined by agreement between the California Department of Fish and Game and Marin Municipal Water District.

The storage level criteria, based on combined storage in Nicasio, Kent, Alpine, Bon Tempe, and Lagunitas reservoirs, used in the operation study to adjust the instream flow classification at the end of each October, January, March, and April and the percentage of months in each category during the 1955-1984 period are described in Tables 2 and 3.

ADULT UPSTREAM MIGRATION

Our analysis of the California Fish and Game Department's Nicasio fish trap catches and results of our attraction flow experiments reported in Volume I led us to believe that a minimum flow of approximately 35 cfs (measured at the Samuel P. Taylor State Park (SPTSP) gage) for three consecutive days is normally required to attract salmon and steelhead into and allow safe passage up Lagunitas Creek to the spawning areas. Such flows have historically been available in almost all years for steelhead that migrate up in January, February, and early March but have often been inadequate for salmon that congregate in the estuary during November and December. We developed schedules that augment fall storms and thereby increase opportunities for salmon to migrate upstream. These schedules require the release of water from Kent Reservoir immediately after each storm that provides a mean daily "trigger" flow of 25 cfs at the Point Reyes Station gage on any day between November 1 through February each year. This schedule essentially augments and prolongs the natural freshets which are sometimes too low or of too short a duration.

If storm induced "trigger" flows do not occur, our schedule creates freshets by providing a release from Kent for upstream migration of salmon on December 1 in years of "wet" storage, December 15 in years of "normal" storage, and on December 31 in years of "below normal" storage. From February 1 through February 28 a similar sequence of releases was developed for upstream migration of adult steelhead. In years of "dry" storage conditions, water for upstream migration would be released to provide passage flows only following the occurrence of a natural "trigger" flow.

Steelhead migrate upstream to spawn later in the winter and early spring when flows are high. Direct observation of them is usually impossible because of turbid water. Our recommended flow for steelhead attraction and passage is the same as that for salmon except that it extends from January 1 through February 28. If no "trigger" has occurred by February 1 under wet storage conditions, February 15 under normal storage conditions, or by February 28 under below normal storage conditions, enough water would be released from Kent Lake to provide an attraction flow. No such artificial freshet would be made if storage levels were at or below dry levels.

Table 2. Lower limits of reservoir storage criteria used for adjusting instream flows in Lagunitas Creek. As examples, if on October 31 total storage in Nicasio, Kent, Alpine, Bon Tempe, and Lagunitas reservoirs was 68,640 acre-feet or greater, the wet level rules would apply until a new decision was made on January 31 and, if said storage was between 68,640 and 38,000, the normal rules would apply.

<u>DATE</u>	<u>WET</u>	<u>NORMAL</u>	<u>BELOW NORMAL</u>	<u>DRY</u>
OCT 31	68,640	38,000	32,000	<32,000
JAN 31	68,640	53,000	44,000	<44,000
MAR 31	68,640	60,000	53,000	<53,000
APR 31	68,640	60,000	53,000	<53,000

Table 3. Percentage of months in the 30-year period (1955-1984) when instream releases were in the named category.

<u>STATUS</u>	<u>NOV-JAN</u>	<u>FEB-MAR</u>	<u>APR</u>	<u>MAY-NOV</u>	<u>TOTAL</u>
WET	0	23	23	20	17
NORMAL	57	24	27	33	35
BELOW NORMAL	10	20	27	17	18
DRY	30	30	20	27	27
EMERGENCY ¹	3	3	3	3	3

¹ Water shortage emergency is defined within Water Code Section 350 et seq.

SPAWNING FLOWS

Both salmon and steelhead spawn in areas characterized by suitable combinations of physical and hydraulic conditions. We observed fish spawning in Lagunitas Creek, identified and defined the characteristics of the habitat being used, measured the amount of spawning habitat available at various flows, and estimated the number of redds that could be built over a range of flows. Spawning habitat for both salmon and steelhead increased linearly as flows rose from 12 cfs to 28 cfs--which was the highest flow that we measured. Our estimates were that, with the streambed conditions similar to those of 1984, this range of flows would provide habitat for a range of 85 to 197 steelhead redds and 217 to 468 salmon redds. The question is, "How many are needed to saturate the juvenile rearing habitat of Lagunitas Creek?" This depends on egg survival and fry emergence rates.

Our investigations of streambed conditions provided evidence that the survival rates of embryos in and emerging from those redds under 1984 streambed conditions would likely average about 59%. Assuming an average 2,000 eggs per redd and only a 50% survival rate, 12 cfs would provide 217,000 salmon and 85,000 steelhead fry emerging into the stream.

Our schedule calls for minimum spawning flows ranging from 10 to 16 cfs. We believe that those flows will provide enough spawning habitat to saturate the juvenile rearing habitat available in the creek throughout the summer.

EMBRYO INCUBATION

We found no relationship between the intragravel dissolved oxygen in redds and the water velocity over them during our studies. Analysis of data that we and others have gathered led us to an opinion that, unless the redds are dewatered, it is streambed conditions and not flow which influence the success of embryo incubation and emergence from the gravel into the river. Since nest building and spawning of either salmon or steelhead can occur over the entire winter and early spring, our schedule for egg incubation simply extends the spawning flows through the winter and early spring.

JUVENILE REARING

Prior to 1979, summer and fall flows usually declined to less than 1 cfs. The lack of juvenile salmonid rearing habitat provided by these low flows was considered the principal constraint on salmonid populations.

In 1979 an agreement between the Department of Fish and Game and MMWD raised summer minimum flows to 1 to 3 cfs, dependent upon the amount of water the District held in storage the previous May. In April 1982, the SWRCB established a new interim flow schedule requiring MMWD to "from July 16 through October 15 bypass or release 4 cfs at or above the Shafter Bridge or maintain 6 cfs at the park gage." The decision allows the reduction of these flows by 25% in years when reservoir storage is low. Because of the 1979 agreement and D-1582, summer flows have increased ranging between 4 and 6 cfs for the last 8 years.

This has increased the salmonid juvenile rearing capacity of Lagunitas Creek. In 1980 we estimated that approximately 7,000 steelhead could be reared in the 7-mile reach from San Geronimo Creek to the mouth of Nicasio Creek at flows of 0.5 cfs and 1979 streambed conditions and that, as flows increased, the numbers of juveniles that could be reared rose to about 45,000 at 6 cfs (Kelley and Dettman 1980).

Our investigations on Lagunitas Creek have shown that juvenile rearing capacity is also very sensitive to streambed conditions--which in 1979 were relatively poor. In riffles, cobble was embedded 24% of its height and that in glides was embedded 40%. We estimate that if sand deposition is decreased enough to reduce cobble embeddedness only by one-fourth, say to levels of 18% in riffles and 30% in glides, the increased summer flows will support twice as many juveniles. Thus at a flow of 3 cfs the stream would rear approximately 40,000 instead of 20,000 steelhead and at a flow of 6 cfs the stream would rear about 90,000 instead of 45,000 steelhead. Our data and that of the Department of Fish and Game (Smith 1986) suggest that further increases would produce even more juveniles.

Unfortunately, high flows have caused much scour of the bed and loss of salmon and steelhead eggs in all years except 1985 and 1987. That scour may have prevented the stream from being saturated with fry, and has made evaluation of the effect of the increased summer flows and streambed improvement impossible. Our strategy with these reservoir operations studies has been to provide as much summer flow as possible with the available water supply. Our recommended minimum summer flows range from 8 cfs when reservoir storage is high down to 4 cfs when it is low.

SPRING JUVENILE REARING AND EMIGRATION

Salmon fry emerge from the gravel and begin rearing in Lagunitas Creek from about mid-February to mid-March, depending upon the date of egg deposition. Steelhead fry emerge and begin rearing generally from early March to mid-May. During our 3 years of study, most of the salmon and steelhead spent their first summer and the following winter rearing in the stream, and

emigrated downstream to Tomales Bay from early April through mid-June of their second year. Our instream flow schedules call for flows for spring rearing and emigration from May 1 through mid-June of 12, 10, 8, and 6 cfs, depending upon the amount of storage in the MMWD Lagunitas Creek basin reservoirs.

Our counts of smolts emigrating during the spring of 1983, 1984, and 1985 did not demonstrate that streamflow had a discernable effect on emigration except that it can be delayed by high flows. These studies, and others that we have done and read about, led us to believe that the smolts usually emigrate downstream when they have reached a large enough size and in response to lengthening days and warming temperatures. Some can, of course, be forced out by drastic flushes of high water or by reduction of flow to reduce their habitat.

We believe that the best kind of instream flow for smolts emigrating in a stream like Lagunitas Creek is one which provides good feeding and rearing conditions and protection from predators but is not large enough to cause the emigrants to cease emigration and seek cover. Such streamflows appeared suitable for salmonid emigration in 1984 and 1985. April and May flows averaged 12.6 and 10 cfs in 1984 and 17.2 and 11 cfs in 1985.

During the emigration season, which lasts through June, maintenance of these flows downstream into the estuary is important.

CHAPTER 3 - OPERATION STUDY RESULTS

Table 4 is a printout from the model operation study describing the mean daily flows in Lagunitas Creek at the SPTSP gage that would have occurred from 1955 through 1984 under three scenarios:

- a. Natural flow--no dam, no MMWD diversion.
- b. The small Kent Dam--no releases were made for fish.
- c. The enlarged Kent Dam and all the other Lagunitas Creek basin reservoirs were operated to meet the minimum instream flows described in Table 1.

The last two scenarios assumed a total annual MMWD demand of 34,000 acre-feet of domestic water, except in critical years when mandatory water conservation was necessary. In very wet years all but 1,000 acre-feet of this demand was supplied from the Lagunitas Creek watershed. In dry years up to 4,300 acre-feet was taken from the Russian River.

Table 4 describes the simulated mean daily flows in Lagunitas Creek at the SPTSP gage during the 1955-1984 period for which the model has been operated. Operating rules adjust the releases to "wet", "normal", "above normal", and "dry" conditions at the end of October, January, March, and April depending upon the total amount of water MMWD has stored in their Lagunitas Creek basin reservoirs. Table 2 listed the storage criteria used by the model to make decisions about which category of instream flow to maintain until the next decision time. The percentage of months that fell into each category was described in Table 3.

Normal or wet condition releases were made in slightly more than half the 360 months of the 30-year period studied. Below normal releases were made in 16% of the months and dry condition releases made in 28%. In 1977, a water supply emergency was declared and instream flows were reduced to low levels that would not have supported successful runs of salmon or steelhead that year.

The instream flows at the SPTSP gage are a combination of water released from Kent Lake, of tributary inflow from San Geronimo Creek, and, at times, releases from the MMWD pipelines that move water from both Nicasio Reservoir and Kent Lake to the San Geronimo Treatment Plant. These pipeline releases join the Kent Lake releases at the base of the dam or occasionally 0.5 miles downstream at a release valve just above the Shafter Bridge.

Releases of Nicasio water into Lagunitas Creek have occurred at these and other places in the past and have, insofar as we know, not caused problems for salmon or steelhead. In the

future, such releases are expected to occur more often during fall and winter following dry years.

We have not studied the effect of occasionally adding some Nicasio Reservoir water to Lagunitas Creek at this upstream point. An obvious concern is that they not warm Lagunitas Creek water above desirable levels for salmonids (below 57°F when adults are spawning, preparing for spawning, or when eggs are incubating and 65°F during juvenile rearing).

We recommend that an analysis be made of the future frequency duration and magnitude of these releases and that their effect on water quality and juvenile salmonid growth be monitored. A few years of good monitoring will provide a sound definition of whether this practice is harmful or beneficial.

Table 5 describes the monthly releases above the Shafter Bridge or spills of water from Kent Reservoir in plan 7 of the operation study which incorporates the recommendations of this report.

We have evaluated the streamflows that would have occurred with the enlarged dam in place on the basis of criteria described in Table 6 and summarized the evaluation in Table 7. Had the operating rules of Tables 1 and 2 been in effect from 1955 through 1984, conditions for adult migration, spawning and embryo incubation, and juvenile rearing would have been what we have classified as "good" in most years and in very few years would have been "poor or minimal." We believe this operation describes flows that will significantly increase salmon and steelhead stocks if the streambed habitat of Lagunitas Creek remains adequate.

PROTECTION OF LAGUNITAS CREEK INSTREAM FLOWS

Our evaluation assumes that during the late fall and winter when adult salmon and steelhead are migrating upstream from Tomales Bay to their spawning ground, or in the spring when juveniles are emigrating downstream, water released for migration and emigration purposes will not be diverted before it reaches the bay.

During wetter portions of the year the discharges and spills from Kent Reservoir are augmented by accretion from springs and tributaries of Lagunitas Creek. During the summer and early fall, the stream loses only a small amount of water as it moves downstream through evaporation and transpiration of riparian vegetation (Table 8).

During the dry season, however, an additional 4-5 cfs is diverted from Lagunitas Creek at its mouth. Up to 3.31 cfs is pumped by the Giacomini Ranch from a long pond behind their

Table 4. Estimated mean daily flows at the SPTSP gage in Lagunitas Creek without any dams on the creek, with the original Kent Dam and release requirements, and with the enlarged Kent Dam and recommended minimum flow schedules in operation.

WATER YEAR-1955											
ENLARGED KENT DAM-PLAN 7 RELEASES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	SEP
1	6.0	6.0	13.0	33.5	28.4	34.1	8.0	13.9	5.0	5.0	5.0
2	6.0	6.0	14.1	23.4	22.4	28.4	8.0	14.4	5.0	5.0	5.0
3	6.0	6.0	14.0	20.5	20.6	23.7	8.0	13.9	5.0	5.0	5.0
4	6.0	6.0	20.9	18.5	18.8	19.8	8.0	12.4	5.0	5.0	5.0
5	6.0	6.0	14.0	17.9	17.1	16.3	8.0	11.4	5.0	5.0	5.0
6	6.0	6.0	216.4	15.9	15.6	13.9	8.0	10.4	5.0	5.0	5.0
7	6.1	6.0	34.9	14.2	14.2	12.8	8.0	9.8	5.0	5.0	5.0
8	6.0	6.0	34.7	14.0	13.0	12.0	8.0	9.0	5.0	5.0	5.0
9	6.0	23.1	96.2	16.2	12.0	12.0	8.0	8.0	5.0	5.0	5.0
10	6.0	11.1	96.3	44.7	12.0	12.0	8.0	8.0	5.0	5.0	5.0
11	6.0	6.0	63.7	32.3	12.0	12.0	8.0	8.0	5.0	5.0	5.0
12	6.0	11.3	42.2	23.4	12.0	12.0	8.0	8.0	5.0	5.0	5.0
13	6.0	6.0	28.2	20.9	12.0	12.0	8.0	8.0	5.0	5.0	5.0
14	6.0	6.0	18.9	18.7	12.0	12.0	8.0	8.0	5.0	5.0	5.0
15	6.0	162.5	16.7	17.2	12.0	12.0	8.0	8.0	5.0	5.0	5.0
16	6.0	35.0	14.7	74.8	12.0	12.0	8.0	8.0	5.0	5.0	5.0
17	6.0	35.0	14.0	35.5	12.0	12.0	8.0	8.0	5.0	5.0	5.0
18	6.0	14.0	14.0	239.0	12.0	12.0	8.0	8.0	5.0	5.0	5.0
19	6.0	14.0	14.0	97.3	12.0	12.0	8.0	8.0	5.0	5.0	5.0
20	6.0	14.0	14.0	78.8	11.0	12.0	13.3	8.0	4.9	5.0	5.0
21	6.0	14.0	14.0	61.2	12.0	12.0	163.4	8.0	5.0	5.0	5.0
22	6.0	14.0	14.0	47.7	12.0	12.0	69.1	8.0	4.9	5.0	5.0
23	6.0	14.0	14.0	37.1	12.0	12.0	63.2	8.0	5.0	5.0	5.0
24	6.0	14.0	14.0	29.0	12.0	12.0	57.7	8.0	5.0	5.0	5.0
25	6.0	14.0	14.0	22.7	12.0	12.0	52.8	8.0	4.9	5.0	5.0
26	6.0	13.8	14.0	20.6	12.0	12.0	36.6	8.0	5.0	5.0	5.0
27	6.0	13.5	14.0	18.7	12.0	12.0	31.9	8.0	5.0	5.0	5.0
28	6.0	13.3	14.0	17.0	12.0	12.0	47.6	8.0	5.0	5.0	5.0
29	6.4	13.1	14.0	15.5	12.0	12.0	43.6	8.0	5.0	5.0	5.0
30	6.0	12.9	14.0	19.9	12.0	12.0	40.0	8.0	5.0	5.0	5.0
31	6.0		16.0	20.9		12.0		8.0		5.0	

WATER YEAR-1955											
SMALL KENT DAM-NO RELEASES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	SEP
1	1.5	0.2	1.0	32.5	27.4	33.1	2.4	14.9	2.0	0.8	1.0
2	1.2	0.2	10.1	22.4	21.6	27.4	2.2	13.6	1.9	0.2	0.9
3	0.9	0.1	9.2	19.5	19.6	22.7	2.0	12.5	1.8	0.7	0.9
4	0.8	0.1	19.9	17.5	17.8	18.8	1.9	11.4	1.7	0.7	0.8
5	0.6	0.1	11.6	16.9	16.1	15.5	1.7	10.4	1.6	0.7	0.8
6	0.5	0.1	215.4	14.9	14.6	12.9	1.6	9.6	1.5	0.6	0.3
7	5.1	0.1	51.9	13.2	13.2	11.8	1.5	8.8	1.4	0.6	0.7
8	4.1	0.1	33.7	11.2	12.0	10.8	1.3	8.0	1.4	0.6	0.7
9	3.3	0.1	95.2	15.2	10.9	10.8	1.2	7.3	1.1	0.5	0.6
10	2.6	22.3	93.3	43.7	9.9	9.9	1.1	6.7	1.2	0.5	0.6
11	2.1	10.1	62.7	31.3	8.9	9.1	1.0	6.2	1.2	0.5	0.6
12	1.7	4.6	41.2	22.4	8.1	8.4	1.0	5.8	1.1	0.5	0.6
13	1.4	10.3	27.2	19.9	7.4	7.7	0.9	5.5	1.0	0.4	0.5
14	1.1	4.8	17.9	17.7	6.7	7.0	0.8	5.2	1.0	0.4	0.5
15	0.9	4.0	15.7	16.2	6.0	6.5	0.8	5.0	0.9	0.4	0.5
16	0.7	161.5	13.7	73.8	5.5	5.9	0.7	4.7	0.9	0.4	0.5
17	0.6	26.9	12.0	54.5	4.8	5.4	0.6	4.5	0.8	0.4	0.5
18	0.5	13.9	10.5	232.0	4.1	5.0	0.6	4.2	0.8	0.4	0.5
19	1.2	7.2	8.2	96.3	3.6	4.6	0.5	4.0	0.7	0.4	0.5
20	1.0	6.1	2.0	77.8	3.1	4.2	12.3	3.8	0.7	0.4	0.5
21	0.8	5.1	7.0	60.2	4.6	3.6	162.4	3.6	0.7	0.4	0.5
22	0.6	4.3	6.2	46.7	4.2	3.5	68.1	3.4	0.6	0.4	0.5
23	0.5	3.6	5.4	36.1	3.2	3.2	62.2	3.2	0.6	0.4	0.5
24	0.5	3.0	4.7	28.0	3.5	3.0	56.7	3.1	0.6	0.4	0.5
25	0.5	2.6	4.1	21.7	3.1	2.7	51.8	2.9	0.5	0.4	0.5
26	0.5	2.2	3.6	19.6	3.0	2.5	55.6	2.8	0.5	0.4	0.5
27	0.5	1.6	3.2	17.7	52.4	2.3	50.9	2.6	0.5	0.4	0.5
28	0.5	1.5	2.8	16.0	43.4	2.1	46.6	2.5	0.5	0.4	0.5
29	0.5	1.3	2.4	14.5		1.9	42.6	2.3	0.4	0.4	0.5
30	0.5	1.1	2.1	18.9		2.1	39.0	2.2	0.4	0.4	0.5
31	0.5		7.5	19.9		1.9		2.1		0.4	0.5

WATER YEAR-1955											
NATURAL FLOW-NO DAM											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	SEP
1	4.6	0.6	3.1	100.1	84.4	101.9	7.4	45.9	6.2	2.5	3.1
2	3.7	0.6	31.1	69.0	86.5	84.4	6.8	41.9	5.9	2.5	2.8
3	2.8	0.3	28.0	60.1	80.4	89.9	6.2	38.5	5.5	2.2	2.8
4	2.5	0.3	61.3	53.9	94.8	97.9	5.9	35.1	5.2	2.2	2.5
5	1.8	0.3	35.7	52.1	49.6	47.7	5.2	32.0	4.9	2.2	2.5
6	1.3	0.3	663.4	45.9	45.0	39.7	4.9	29.6	4.6	1.8	2.5
7	15.7	0.3	166.0	40.7	40.7	36.3	4.6	27.1	4.3	1.8	2.2
8	12.6	0.3	103.8	36.0	37.0	33.3	4.0	24.6	4.0	1.5	1.8
9	10.2	0.3	293.2	46.8	35.6	33.3	3.7	22.5	3.7	1.5	2.2
10	8.0	68.7	293.3	134.6	30.5	30.5	3.4	20.6	3.7	1.5	1.8
11	6.5	31.1	192.1	96.4	27.4	28.0	3.1	19.1	3.7	1.5	1.8
12	5.2	14.2	126.9	69.0	24.9	25.9	3.1	17.9	3.4	1.5	1.8
13	4.3	31.7	65.8	61.3	22.8	23.7	2.8	16.9	3.1	1.2	1.5
14	3.4	14.8	55.1	54.5	20.6	21.6	2.5	16.0	3.1	1.2	1.5
15	2.8	12.3	48.4	49.9	18.5	20.0	2.5	15.4	2.8	1.2	1.5
16	2.2	497.4	42.2	227.3	16.9	18.2	2.3	14.3	2.8	1.2	1.5
17	1.8	82.9	37.0	167.9	20.9	16.6	1.8	13.9	2.5	1.2	1.5
18	1.5	42.8	32.3	733.0	18.8	15.4	1.8	12.9	2.5	1.2	1.5
19	3.7	22.2	23.3	296.6	17.2	14.2	1.5	12.3	2.5	1.2	1.5
20	3.1	18.8	24.6	239.6	15.7	12.9	3.9	11.7	2.2	1.2	1.5
21	2.5	15.7	21.6	185.4	14.2	11.7	300.2	10.5	1.8	1.2	1.5
22	1.8	13.2	19.1	143.8	12.9	10.8	209.7	10.5	1.8	1.2	1.5
23	1.5	11.1	16.6	111.2	11.7	9.9	191.6	9.9	1.8	1.2	1.5
24	1.5	9.2	14.5	86.2	10.8	9.2	174.6	9.5	1.8	1.2	1.5
25	1.5	8.0	12.4	66.8	9.3	8.3	159.3	8.9	1.5	1.2	1.5
26	1.5	6.8	11.1	60.4	9.2	7.7	171.2	8.6	1.5	1.2	1.5
27	1.5	5.5	9.9	54.5	161.4	7.1	156.8	8.0	1.5	1.2	1.5
28	1.5	4.6	8.6	49.3	133.7	6.5	143.5	7.7	1.5	1.2	1.5
29	1.5	4.0	7.4	44.7		5.9	131.2	7.1	1.2	1.2	1.5
30	1.5	3.4	6.5	58.2		6.5	120.1	6.8	1.2	1.2	1.5
31	1.5		23.1	61.3		5.9		6.5		1.2	

WATER YEAR=1956

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	5.0	7.9	569.4	214.1	110.1	16.0	17.5	10.0	6.0	6.0	6.0
2	5.0	5.0	6.7	249.7	202.6	103.0	15.3	16.7	10.0	6.0	6.0	6.0
3	5.0	5.0	5.7	232.1	193.3	98.1	14.6	15.9	10.0	6.0	6.0	6.0
4	5.0	5.0	5.0	221.6	183.2	93.2	14.0	26.4	10.0	6.0	6.0	6.0
5	5.0	5.0	5.0	269.2	174.2	89.6	14.0	25.1	10.0	6.0	6.0	6.0
6	5.0	5.0	347.0	255.6	165.4	83.9	14.0	23.9	10.0	6.0	6.0	6.0
7	5.0	5.0	69.5	289.6	157.8	78.2	14.0	22.8	10.0	6.0	6.0	6.0
8	5.0	5.1	39.3	717.9	149.2	73.6	14.0	21.7	10.0	6.0	6.0	6.0
9	5.0	5.0	22.4	323.6	141.8	69.1	14.0	20.6	10.0	6.0	6.0	6.0
10	5.0	5.0	13.1	386.7	134.5	64.6	14.0	19.7	10.0	6.0	6.0	6.0
11	5.0	5.0	12.0	366.7	128.3	60.2	29.9	18.7	10.0	6.0	6.0	6.0
12	5.0	5.0	12.0	346.1	122.3	55.9	27.0	17.8	10.0	6.0	6.0	6.0
13	5.0	5.0	12.0	442.1	116.3	52.7	23.9	17.0	10.0	6.0	6.0	6.0
14	5.0	7.8	12.0	1133.9	110.3	49.3	22.3	16.2	10.0	6.0	6.0	6.0
15	5.0	6.5	12.0	2315.3	104.7	46.4	20.3	15.4	10.0	6.0	6.0	6.0
16	5.0	5.3	12.0	1207.6	100.0	42.3	19.3	14.7	5.9	6.0	6.0	6.0
17	5.0	15.2	31.3	577.1	94.4	39.3	18.6	14.0	3.9	6.0	6.0	6.0
18	5.0	12.6	25.6	287.0	89.9	36.3	17.7	13.4	3.9	6.0	6.1	6.0
19	5.0	16.3	1089.4	273.3	83.4	33.4	16.9	12.8	3.9	6.0	6.1	6.0
20	5.0	13.3	628.7	337.0	509.0	30.3	16.1	12.2	3.9	6.0	6.0	6.0
21	5.0	21.1	273.6	321.0	344.7	27.7	15.3	11.6	3.9	6.0	6.0	6.0
22	5.0	17.3	1365.1	314.9	893.9	24.9	14.6	11.1	6.0	6.0	6.1	6.0
23	5.0	14.5	947.1	340.2	858.2	23.2	14.0	10.6	3.9	6.0	6.0	6.0
24	5.0	29.2	436.4	323.3	453.9	21.3	14.0	10.1	3.9	6.0	6.1	6.0
25	5.0	13.8	183.5	622.9	248.4	19.8	14.0	10.0	3.9	6.0	6.0	6.0
26	5.0	11.3	274.7	417.1	279.2	18.1	27.4	10.0	6.0	6.0	6.0	6.0
27	5.0	9.7	123.3	217.1	264.7	16.3	27.7	10.0	3.9	6.0	6.0	6.0
28	5.0	8.2	53.9	228.9	252.5	16.0	26.4	10.0	3.9	6.0	6.0	6.0
29	5.0	6.9	49.8	217.2	277.9	16.0	21.1	10.0	6.0	6.0	6.0	6.0
30	5.0	5.9	75.2	206.7		16.0	23.9	10.0	6.0	6.0	6.0	6.0
31	5.0		69.9	196.4		16.0		10.0	6.0	6.0	6.0	6.0

WATER YEAR=1956

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	1.7	6.9	588.4	213.1	130.1	21.0	22.3	4.6	3.7	2.5	4.1
2	2.3	1.3	5.7	248.7	201.6	123.0	19.3	18.7	4.4	3.3	2.4	3.9
3	1.9	1.1	4.7	231.1	192.3	117.1	17.6	16.9	4.1	3.2	2.3	3.7
4	1.5	0.9	3.9	220.6	182.2	111.2	15.9	40.4	3.9	3.2	2.2	3.3
5	1.5	0.7	3.2	268.2	173.2	109.6	14.2	37.1	3.7	3.0	2.0	3.4
6	1.5	0.6	346.0	254.6	164.4	104.9	12.6	34.9	3.3	2.9	1.9	3.2
7	1.5	0.4	68.5	288.6	156.8	99.2	12.1	32.8	3.6	2.7	1.9	3.0
8	1.5	0.4	18.3	716.9	148.2	94.6	10.5	30.7	3.2	2.6	1.8	2.9
9	1.5	0.3	21.4	322.6	140.8	90.1	10.0	28.6	3.0	2.5	1.7	2.7
10	1.5	0.3	12.1	386.7	133.5	84.6	9.8	26.7	2.9	2.3	1.6	2.6
11	1.5	0.3	10.3	363.7	127.3	79.2	35.9	24.7	2.7	2.2	1.5	2.5
12	1.5	0.3	8.8	345.1	121.3	74.9	33.0	22.3	2.6	2.1	1.4	2.3
13	1.5	0.3	7.5	441.1	115.3	69.7	32.9	21.0	2.3	2.0	1.4	2.2
14	1.5	6.8	6.4	1132.9	109.5	64.5	31.5	16.2	2.4	1.9	1.3	2.1
15	1.5	5.5	5.5	2314.3	103.7	58.4	29.5	15.4	2.2	1.8	1.2	2.0
16	1.5	4.5	6.7	1204.6	89.0	53.3	27.5	13.7	2.1	1.7	1.2	1.9
17	1.5	14.2	30.3	576.1	93.4	49.3	25.6	13.0	2.0	1.6	1.1	1.8
18	1.5	11.6	24.6	186.0	88.9	46.3	23.7	12.4	1.9	1.6	1.1	1.7
19	1.5	15.3	108.4	272.3	84.4	43.4	21.9	11.8	1.8	1.5	1.0	1.6
20	1.5	12.5	627.7	336.0	508.0	40.5	20.1	11.2	1.7	1.4	0.9	1.6
21	1.5	20.1	272.6	320.0	343.7	38.7	18.3	10.6	1.6	1.3	0.9	1.5
22	1.5	16.5	1364.1	313.9	892.9	34.9	16.6	10.1	1.6	1.2	0.9	1.4
23	1.5	13.5	2914.1	339.2	857.2	32.2	14.9	9.6	1.5	1.2	0.8	1.3
24	1.5	28.2	1340.4	324.3	452.9	29.5	13.3	9.1	1.4	1.1	0.8	1.3
25	1.5	12.6	562.5	621.9	247.4	27.8	12.7	8.6	1.3	1.1	0.7	2.5
26	1.5	10.5	842.7	416.1	278.2	26.1	14.4	8.2	1.3	1.0	0.7	2.3
27	1.5	8.7	377.5	216.1	263.7	26.5	12.7	7.8	1.2	1.0	0.7	2.2
28	1.5	7.2	162.9	227.9	251.5	24.0	19.4	7.4	1.1	0.9	0.7	2.1
29	1.5	5.9	150.8	216.2	276.9	23.4	17.1	7.0	1.1	0.9	0.7	2.0
30	1.5	4.9	228.2	205.7		20.9	14.9	4.7	1.0	0.8	0.7	1.9
31	1.5		211.9	195.4		19.4		6.4		0.8	0.7	

WATER YEAR=1956

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	5.2	21.3	568.0	212.8	129.7	46.2	50.8	14.2	11.4	7.7	12.6
2	7.1	4.0	12.6	248.8	202.0	123.2	44.0	48.4	13.6	10.8	7.4	12.0
3	5.9	3.4	14.3	231.3	191.9	117.3	41.9	43.9	12.6	10.2	7.1	11.4
4	4.6	2.8	12.0	220.5	182.3	111.5	39.7	78.2	12.0	9.9	6.8	10.8
5	4.6	2.2	9.9	268.6	173.1	109.6	37.6	74.2	11.4	9.2	6.2	10.5
6	4.6	1.8	1065.7	234.4	164.5	104.4	35.7	70.5	10.8	8.9	5.9	9.9
7	4.6	1.2	211.0	288.5	136.3	99.2	34.2	67.1	10.3	8.3	5.9	9.2
8	4.6	1.2	118.0	717.3	148.5	94.2	32.3	63.8	9.9	8.0	5.3	8.9
9	4.6	0.9	65.9	322.2	141.1	89.6	30.8	60.4	9.2	7.7	5.2	8.3
10	4.6	0.9	37.3	387.2	134.0	85.0	30.2	57.4	8.9	7.1	4.9	8.0
11	4.6	0.9	31.7	365.6	127.2	80.7	70.5	54.3	8.3	6.8	4.6	7.7
12	4.6	0.9	27.1	343.3	121.0	76.7	67.8	51.7	8.0	6.3	4.3	7.4
13	4.6	0.9	23.1	440.7	114.9	73.0	64.4	49.3	7.7	6.2	4.3	7.1
14	4.6	20.9	19.7	1133.1	109.3	69.3	63.1	46.8	7.4	5.9	4.0	6.5
15	4.6	16.9	16.9	2314.6	103.8	63.9	60.1	44.4	6.8	5.3	3.7	6.2
16	4.6	13.9	20.6	1206.1	98.6	62.5	57.0	42.2	6.5	5.2	3.7	5.9
17	4.6	43.7	93.3	576.3	93.6	59.4	54.2	40.0	6.2	4.9	3.4	5.3
18	4.6	35.7	75.8	286.4	89.0	56.4	51.4	38.2	5.9	4.9	3.4	5.2
19	4.6	47.1	3352.3	272.0	84.4	53.6	49.0	36.3	5.3	4.6	3.1	4.9
20	4.6	38.3	1933.3	335.7	508.2	50.8	46.3	34.3	5.2	4.3	2.8	4.6
21	4.6	61.9	839.6	320.3	344.0	48.4	44.0	32.6	4.9	4.0	2.8	4.6
22	4.6	50.8	4201.4	313.9	892.9	43.9	41.9	31.1	4.9	4.0	2.8	4.3
23	4.6	41.6	2914.0	339.4	856.9	43.7	39.7	29.6	4.6	3.7	2.3	4.0
24	4.6	86.9	1341.0	324.3	452.5	41.6	37.9	28.0	4.3	3.4	2.3	4.0
25	4.6	39.4	562.1	621.9	247.6	39.4	36.0	26.3	4.0	3.4	2.2	7.7
26	4.6	32.3	843.0	416.1	277.8	37.3	81.3	23.3	4.0	3.1	2.2	7.1
27	4.6	26.8	377.3	215.9	264.0	35.4	82.2	24.0	3.7	3.1	2.2	6.8
28	4.6	22.2	162.9	227.6	251.0	33.9	78.2	22.8	3.4	2.8	2.2	6.3
29	4.6	18.2	150.3	216.2	276.9	32.0	74.2	21.4	3.4	2.8	2.2	6.2
30	4.6	15.1	228.5	205.4		30.5	70.3	20.6	3.1	2.3	2.2	5.9
31	4.6		212.2	195.3		29.0		19.7		2.3	2.2	

WATER YEAR-1957

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	29.7	6.0	20.0	10.0	40.2	13.6	13.7	16.6	2.7	3.0	5.0
2	6.0	13.4	6.0	16.0	10.0	29.5	12.6	13.2	13.6	3.4	3.0	3.0
3	6.0	11.2	6.0	13.9	10.0	21.7	11.7	12.4	12.7	5.2	3.0	3.0
4	6.0	7.4	6.0	13.6	10.0	93.1	10.8	11.7	11.9	8.0	5.0	5.0
5	6.0	7.9	16.8	13.3	10.0	93.1	10.0	11.0	13.1	5.0	5.0	5.0
6	6.0	6.6	12.4	13.1	10.0	71.9	9.3	10.4	10.4	5.0	5.0	5.0
7	6.0	6.0	10.4	12.9	10.0	55.1	8.7	9.8	9.7	5.0	5.0	5.0
8	6.0	6.0	8.8	12.7	14.8	42.2	8.1	9.3	9.1	5.0	5.0	5.0
9	5.0	6.0	7.4	12.6	12.9	80.5	8.0	10.3	8.5	5.0	5.0	4.9
10	6.0	6.0	6.9	12.5	11.2	63.0	8.0	9.8	8.0	5.0	5.0	5.0
11	6.0	6.0	6.8	12.4	10.0	49.5	8.0	9.2	7.5	5.0	3.0	5.0
12	6.0	6.0	6.6	14.4	10.0	68.8	8.0	8.8	7.0	5.0	5.0	5.0
13	6.0	6.0	6.1	42.3	10.0	55.0	8.0	8.3	6.6	5.0	5.0	5.0
14	6.0	6.0	6.0	35.0	10.0	43.9	22.4	8.0	6.2	5.0	5.0	5.0
15	6.0	6.0	35.0	35.0	10.0	112.0	19.5	8.0	5.8	5.0	5.0	5.0
16	6.0	6.0	35.0	13.0	10.0	87.3	18.2	8.0	5.6	5.0	5.0	4.9
17	6.0	6.0	35.0	14.0	10.0	84.3	17.0	8.0	5.4	5.0	5.0	5.0
18	6.0	6.0	14.0	14.0	10.0	71.0	24.1	78.7	5.1	5.0	5.0	5.0
19	6.0	6.0	14.0	14.0	10.0	59.8	21.9	96.4	5.0	5.0	5.0	5.0
20	6.0	6.0	14.0	170.6	10.0	50.4	19.9	89.2	5.0	5.0	5.0	5.0
21	6.0	6.0	14.0	35.5	259.4	42.5	18.1	91.7	5.0	5.0	5.0	5.0
22	6.0	6.0	14.0	35.0	94.0	35.9	17.0	85.2	5.0	5.0	5.0	5.0
23	6.0	6.0	14.0	14.0	331.1	30.3	15.9	79.2	5.0	5.0	5.0	5.0
24	6.0	6.0	14.0	14.0	202.7	25.6	14.9	73.6	5.0	5.0	5.0	5.0
25	6.0	6.0	14.0	15.0	191.5	21.7	14.0	68.4	5.0	5.0	5.0	5.0
26	6.0	6.0	14.0	14.0	190.1	18.4	13.2	63.6	5.0	5.0	5.0	5.0
27	6.0	6.0	14.0	14.0	142.3	15.6	12.4	59.1	5.0	5.0	5.0	5.0
28	6.0	6.0	14.0	14.0	105.8	14.4	11.6	55.0	5.0	5.0	5.0	5.0
29	6.0	6.0	14.0	14.0		13.3	10.9	51.1	5.0	5.0	5.0	5.0
30	84.6	6.0	14.0	14.0		12.6	10.3	47.5	5.0	5.0	5.0	4.9
31	52.2		14.0	14.0		12.0		44.2		5.0	5.0	

WATER YEAR-1957

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	28.7	3.1	2.8	6.5	39.2	12.6	12.7	13.6	4.7	2.7	0.5
2	4.0	12.4	2.9	2.3	5.6	28.3	11.6	12.2	12.6	4.4	2.6	0.3
3	3.2	10.2	2.9	1.9	4.8	20.7	10.7	11.4	11.7	4.2	2.5	0.3
4	2.6	8.4	2.9	1.6	4.1	92.1	9.8	10.7	10.9	4.0	2.3	0.4
5	2.0	6.9	13.8	1.3	3.5	92.3	9.0	10.0	10.1	3.8	2.2	0.4
6	1.6	5.6	11.4	1.1	3.0	70.7	8.3	9.4	9.4	3.6	2.1	0.4
7	1.3	4.6	9.4	0.9	2.5	54.1	7.7	8.8	8.7	3.4	2.0	0.4
8	1.1	3.8	7.8	0.7	13.8	41.2	7.1	8.3	8.1	3.3	1.9	0.4
9	0.8	3.1	6.4	0.6	11.9	79.5	6.5	9.3	7.5	3.1	1.8	0.3
10	0.7	2.6	5.3	0.5	10.2	62.0	6.0	8.8	7.0	2.9	1.7	0.3
11	0.7	2.1	4.4	0.4	8.8	48.5	5.5	8.2	6.5	2.8	1.6	0.3
12	0.7	1.7	3.6	0.4	7.6	67.8	5.1	7.8	6.0	2.7	1.6	0.3
13	0.7	1.4	3.0	0.3	6.5	54.0	4.7	7.3	5.6	2.5	1.5	0.3
14	0.7	1.2	2.9	0.3	5.6	42.9	21.4	6.9	5.2	2.4	1.4	0.3
15	0.7	1.0	2.9	0.3	4.8	211.0	18.5	6.5	4.8	2.3	1.3	0.3
16	0.7	0.8	2.9	0.3	4.1	86.5	17.2	6.1	4.6	2.2	1.3	0.2
17	0.7	0.6	2.9	0.3	3.6	63.3	16.0	5.5	4.4	2.1	1.2	0.2
18	0.7	0.5	2.9	0.3	3.1	70.0	23.1	72.7	4.1	2.0	1.1	0.2
19	0.7	0.4	2.9	0.3	2.6	52.8	20.9	196.4	3.9	1.9	1.1	0.2
20	0.7	0.4	2.9	0.3	2.4	49.4	18.9	180.2	3.7	1.8	1.0	0.2
21	0.7	0.3	2.9	0.3	2.4	34.3	253.4	41.5	17.1	185.7	3.5	1.7
22	0.7	0.3	2.9	0.3	1.4	93.0	34.9	16.0	171.2	3.4	1.6	0.9
23	0.7	0.3	2.9	0.3	1.0	330.1	29.3	14.9	151.2	3.2	1.5	0.9
24	0.7	0.3	2.9	0.3	0.9	201.7	24.6	13.9	140.6	3.0	1.4	0.8
25	0.7	0.3	2.9	0.3	0.9	190.5	20.7	13.0	130.4	2.9	1.4	0.8
26	0.7	0.3	2.9	0.3	0.8	189.1	17.4	12.2	120.6	2.7	1.3	0.8
27	0.7	0.3	2.9	0.3	0.8	141.3	14.6	11.4	111.1	2.6	1.2	0.7
28	0.7	0.3	2.9	0.3	0.9	104.8	13.4	10.6	102.0	2.5	1.2	0.7
29	0.7	0.3	2.9	0.3	0.2	12.3	5.9	93.1	2.4	1.1	0.6	0.3
30	83.6	0.3	2.9	0.3	0.6	11.6	5.3	84.5	2.2	1.1	0.6	0.2
31	51.2		2.9	0.3	0.1	11.0		78.2		1.0	0.6	

WATER YEAR-1957

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.4	88.4	9.5	8.6	20.0	120.7	38.8	39.1	41.9	14.5	8.3	1.5
2	12.3	38.2	8.9	7.1	17.2	87.8	35.7	37.6	38.8	13.6	8.0	1.5
3	9.9	31.4	8.9	5.9	14.8	63.8	33.0	35.1	36.0	12.9	7.7	1.5
4	8.0	25.9	8.9	4.9	12.6	283.7	30.2	33.0	31.6	12.3	7.1	1.2
5	6.2	21.3	42.3	4.0	10.8	284.3	27.7	30.8	31.1	11.7	6.8	1.2
6	4.9	17.2	35.1	3.4	9.8	218.4	25.6	29.0	29.0	11.1	6.5	1.2
7	4.0	14.2	29.0	2.8	7.7	166.6	23.7	27.1	26.8	10.5	6.2	1.2
8	3.4	11.7	24.0	2.2	42.5	126.9	21.9	25.6	24.9	10.2	5.9	1.2
9	2.5	9.5	19.7	1.8	36.7	244.9	20.0	28.6	23.1	9.5	5.5	0.9
10	2.2	8.0	16.3	1.5	31.4	191.0	18.5	27.1	21.6	8.9	5.2	0.9
11	2.2	6.5	13.6	1.2	27.1	149.4	16.9	25.3	20.0	8.6	4.9	0.9
12	2.2	5.2	11.1	1.1	23.4	208.8	15.7	24.2	19.5	8.3	4.9	0.9
13	2.2	4.3	9.2	1.2	20.0	166.3	14.5	23.0	18.5	7.9	4.6	0.9
14	2.2	3.7	8.9	1.2	17.2	132.1	13.3	21.2	16.9	7.1	4.3	0.9
15	2.2	3.1	8.9	1.1	14.8	649.9	12.0	20.0	14.9	6.1	4.0	0.9
16	2.2	2.5	8.9	1.0	12.6	266.4	10.8	18.8	14.2	5.8	4.0	0.6
17	2.2	1.8	8.9	0.9	10.8	256.6	9.3	17.9	13.6	5.5	3.7	0.6
18	2.2	1.5	8.9	0.9	9.5	215.6	8.1	16.9	12.6	5.2	3.4	0.6
19	2.2	1.2	8.9	0.9	8.0	181.1	7.4	16.0	12.0	5.0	3.4	0.6
20	2.2	1.0	8.9	0.9	7.4	152.2	6.8	15.2	11.4	4.8	3.1	0.6
21	2.2	0.9	8.9	0.9	6.9	127.8	6.2	14.3	10.8	4.6	3.1	0.6
22	2.2	0.9	8.9	0.9	6.4	107.5	5.7	13.4	10.5	4.4	2.8	0.6
23	2.2	0.9	8.9	0.9	5.9	101.7	5.2	12.5	10.0	4.2	2.5	0.6
24	2.2	0.9	8.9	0.9	5.4	82.2	4.7	11.6	9.2	4.0	2.3	0.6
25	2.2	0.9	8.9	0.9	4.9	68.7	4.2	10.7	8.9	3.9	2.3	0.6
26	2.2	0.9	8.9	0.9	4.4	58.2	3.7	9.8	8.3	3.8	2.3	0.6
27	2.2	0.9	8.9	0.9	3.9	43.2	3.2	8.9	8.0	3.7	2.2	0.6
28	2.2	0.9	8.9	0.9	3.4	32.8	2.7	8.0	7.7	3.7	2.2	0.6
29	2.2	0.9	8.9	0.9	2.9	22.8	2.2	7.1	7.4	3.4	1.8	0.6
30	257.5	0.9	8.9	0.9	2.4	11.1	1.7	6.2	6.8	3.4	1.8	0.6
31	157.7		8.9	0.9	1.9	3.9	1.2	5.3	5.1	3.1	1.8	

WATER YEAR=1958

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.4	47.0	14.4	161.2	310.6	283.4	794.7	39.0	12.8	8.0	8.0	8.0
2	10.4	37.8	14.0	103.6	231.7	259.8	870.6	24.3	12.2	8.0	8.0	8.0
3	8.6	33.7	14.0	90.9	100.0	337.4	780.1	13.7	12.0	8.0	8.0	8.0
4	7.2	28.3	14.0	79.8	182.9	224.4	414.3	13.0	12.0	8.0	8.0	8.0
5	6.0	24.2	14.0	70.0	78.7	211.4	204.2	12.4	12.0	8.0	8.0	8.0
6	5.1	20.3	14.0	61.3	69.3	201.7	352.0	12.0	12.0	8.0	8.0	8.0
7	3.0	17.4	14.0	54.0	345.4	191.1	294.6	12.0	12.0	8.0	8.0	8.0
8	3.0	14.9	14.0	47.4	268.2	183.2	279.4	12.0	12.0	8.0	8.0	8.0
9	8.1	14.0	14.0	41.7	114.3	174.0	263.3	12.0	12.0	8.0	8.0	8.0
10	69.2	14.0	14.0	36.6	1674.0	174.8	249.8	12.0	12.0	8.0	8.0	8.0
11	31.3	14.0	14.0	34.4	1046.3	163.8	236.4	12.0	12.0	8.0	8.0	8.0
12	26.1	14.0	14.0	30.3	1301.2	153.0	223.2	12.0	12.0	8.0	8.0	8.0
13	160.9	14.0	14.0	45.1	660.1	142.3	211.2	12.0	12.0	8.0	8.0	8.0
14	80.1	14.0	14.0	40.0	291.3	132.7	199.4	12.0	12.0	8.0	8.0	8.0
15	40.2	14.0	14.0	35.5	446.7	123.3	187.7	12.0	12.0	8.0	8.0	8.0
16	33.7	14.0	14.0	31.5	473.2	116.0	177.3	12.0	8.0	8.0	8.0	8.0
17	28.4	14.0	14.0	28.0	443.6	108.8	167.0	12.0	8.0	8.0	8.0	8.0
18	23.8	14.0	14.0	24.9	472.1	102.7	157.9	12.0	8.0	8.0	8.0	7.9
19	20.1	14.0	14.0	22.1	1477.1	95.7	149.0	12.0	8.0	8.1	8.0	8.0
20	16.9	13.9	59.3	19.7	671.9	89.8	140.2	12.0	8.0	8.0	8.0	8.0
21	14.3	13.6	58.2	17.3	306.1	83.0	131.3	12.0	8.0	8.0	8.0	8.0
22	12.1	13.6	154.6	15.6	289.9	79.3	123.0	12.0	8.0	8.0	8.0	8.0
23	15.0	13.6	98.7	14.0	275.0	98.7	115.6	12.0	8.0	8.0	8.0	8.0
24	23.6	13.6	86.6	14.0	402.3	94.2	108.3	12.0	8.0	8.0	8.0	8.0
25	20.0	13.6	73.4	14.0	1976.6	90.2	102.2	12.0	8.0	8.0	8.0	8.0
26	17.0	13.6	66.3	265.7	929.5	86.4	96.1	12.0	8.0	8.0	8.0	8.0
27	14.3	13.6	57.8	209.0	436.2	103.7	89.1	12.0	8.0	8.0	8.0	8.0
28	12.4	13.6	51.0	163.7	414.1	98.7	81.3	12.0	8.0	8.0	8.0	8.0
29	10.6	13.6	46.8	184.0		94.0	70.3	12.0	8.0	8.0	8.0	8.0
30	9.1	13.6	40.9	1245.1		266.3	63.8	12.0	8.0	8.0	8.0	8.0
31	7.8		35.8	496.8		251.9		12.0	8.0	8.0	8.0	

WATER YEAR=1958

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.6	46.0	13.4	160.2	942.6	272.4	803.7	25.0	11.2	2.1	2.4	0.6
2	9.4	38.8	11.3	102.6	699.7	270.8	882.6	22.3	11.2	2.0	2.3	0.5
3	7.6	32.7	9.6	89.9	293.0	256.4	292.1	15.7	10.7	1.9	2.2	0.5
4	6.2	27.5	8.2	78.8	547.9	244.4	424.3	12.0	10.1	1.8	2.1	0.5
5	5.0	23.2	7.0	69.0	227.7	232.4	216.2	11.4	9.6	1.7	2.0	0.5
6	4.1	19.5	6.0	60.3	198.5	220.7	364.0	10.3	9.1	1.7	1.9	0.4
7	3.3	16.4	5.1	53.0	1726.4	210.1	306.6	10.3	8.7	1.6	1.8	0.4
8	2.7	13.9	4.3	46.4	811.2	157.2	291.4	9.8	8.3	1.5	1.7	0.4
9	2.1	11.7	3.7	40.7	337.3	127.0	275.3	9.3	7.9	1.4	1.6	0.4
10	68.2	9.9	3.1	92.6	2412.0	174.8	259.2	8.8	7.5	1.4	1.5	0.4
11	30.5	8.3	2.7	89.4	1033.5	162.8	247.4	8.4	7.1	1.3	1.4	0.3
12	25.1	7.0	2.3	79.3	1485.2	154.0	233.2	8.0	6.8	1.2	1.4	0.3
13	159.9	6.0	2.0	125.1	847.1	146.3	220.2	7.6	6.4	1.2	1.3	0.3
14	79.1	5.1	2.0	113.0	278.3	137.7	207.4	7.2	6.1	1.1	1.2	0.3
15	39.2	4.3	2.0	101.3	445.7	135.3	194.7	6.8	5.8	1.0	1.2	0.3
16	32.7	3.7	2.0	90.3	472.2	124.3	182.3	6.5	5.5	1.0	1.1	0.3
17	27.4	3.1	2.9	80.0	442.6	116.8	174.0	6.2	5.2	0.9	1.1	0.3
18	22.8	2.7	50.5	70.9	471.1	110.7	165.9	5.9	5.0	0.9	1.1	0.2
19	19.1	2.3	43.9	62.1	1476.1	103.7	158.0	5.6	4.7	0.9	1.1	0.2
20	15.9	1.9	58.5	52.7	670.9	97.8	150.2	5.3	4.5	0.8	1.1	0.2
21	13.3	1.6	57.2	43.5	305.1	93.0	143.5	5.0	4.3	0.8	1.1	0.2
22	11.1	1.4	151.6	37.6	283.9	87.3	137.0	4.8	4.0	0.7	1.1	0.2
23	14.0	1.6	97.7	29.9	274.0	106.7	130.6	4.5	3.8	0.7	1.1	0.2
24	22.6	1.6	85.6	23.3	401.3	102.2	123.3	4.3	3.7	0.7	1.1	0.2
25	19.0	1.6	74.4	24.8	1576.6	99.2	116.2	4.1	3.5	0.6	1.1	0.2
26	16.0	1.6	65.3	804.7	928.5	94.4	109.1	3.9	3.3	0.6	1.1	0.3
27	13.5	1.6	56.8	630.0	435.2	113.7	102.1	3.7	3.1	0.6	1.1	0.3
28	11.4	1.6	50.0	488.7	413.1	106.7	96.3	3.5	3.0	0.5	1.1	0.3
29	9.6	1.4	43.8	552.0		102.0	29.5	3.3	2.8	0.5	1.1	0.3
30	8.1	1.6	39.9	3820.1		275.3	83.8	3.2	2.7	0.5	1.1	0.3
31	6.8		34.8	1514.8		261.9		3.0		0.5	1.1	

WATER YEAR=1958

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35.7	141.7	41.3	493.4	953.6	284.6	818.4	43.1	36.3	6.3	7.4	1.8
2	29.0	119.3	34.8	316.0	710.6	270.4	893.0	41.0	34.5	6.2	7.1	1.5
3	23.4	100.7	29.6	276.9	304.9	256.9	804.2	39.1	33.0	5.9	6.8	1.3
4	19.1	84.7	25.3	242.7	560.3	244.6	438.3	37.0	31.1	5.5	6.5	1.3
5	15.4	71.3	21.6	212.3	239.3	232.2	228.5	35.1	29.6	5.2	6.2	1.3
6	12.6	60.1	18.5	186.3	211.0	220.8	576.0	33.3	28.0	5.2	5.9	1.2
7	10.2	50.3	15.7	163.2	1738.4	209.7	319.1	31.7	26.8	4.9	5.5	1.2
8	8.3	42.8	13.2	142.9	923.0	203.9	303.1	30.2	25.6	4.6	5.2	1.2
9	21.9	36.0	11.4	123.4	349.0	194.0	288.0	28.6	24.3	4.3	4.9	1.2
10	110.1	30.3	9.3	102.9	2424.0	184.2	273.3	27.1	23.1	4.0	4.6	1.2
11	73.9	25.6	8.3	102.9	1045.7	174.9	260.0	25.9	21.9	4.0	4.3	0.9
12	77.3	21.6	7.1	90.9	1500.6	166.3	247.0	24.6	20.9	3.7	4.3	0.9
13	492.3	18.3	6.2	135.8	659.4	158.0	234.7	23.4	19.7	3.7	4.0	0.9
14	243.6	15.7	6.2	120.1	290.4	150.0	223.0	22.2	18.8	3.4	3.7	0.9
15	120.7	13.2	6.2	106.3	445.7	142.6	211.6	20.9	17.9	3.1	3.7	0.9
16	100.7	11.4	6.2	93.9	471.9	135.3	201.1	20.0	16.9	3.1	3.4	0.9
17	84.4	9.3	8.9	83.2	442.3	128.7	191.0	19.1	16.0	2.8	3.4	0.9
18	70.2	8.3	155.3	73.6	471.3	122.3	181.4	18.2	15.4	2.8	3.4	0.8
19	58.8	7.1	133.2	63.0	1475.6	116.1	172.3	17.2	14.3	2.8	3.4	0.8
20	49.0	5.9	180.2	57.6	671.1	110.3	163.9	16.3	13.9	2.5	3.4	0.8
21	41.0	4.9	176.2	50.8	303.2	104.7	153.3	15.4	13.2	2.5	3.4	0.8
22	34.2	4.9	473.1	45.0	289.2	99.3	147.8	14.8	12.3	2.2	3.4	0.8
23	43.1	4.9	300.9	39.7	274.1	119.2	140.4	13.9	11.7	2.2	3.4	0.8
24	69.6	4.9	263.6	35.4	401.3	114.6	133.4	13.2	11.4	2.2	3.4	0.8
25	58.3	4.9	229.2	36.3	1976.1	111.3	126.9	12.6	10.8	1.8	3.4	0.8
26	49.3	4.9	201.1	815.3	928.6	106.0	120.4	12.0	10.2	1.8	3.4	0.9
27	41.6	4.9	174.9	640.6	434.9	123.4	114.3	11.4	9.5	1.8	3.4	0.9
28	33.1	4.9	154.0	301.1	413.0	119.2	108.7	10.8	9.2	1.5	3.4	0.9
29	29.6	4.9	141.1	563.6		114.0	103.2	10.2	8.6	1.5	3.4	0.9
30	24.9	4.9	122.9	3831.8		287.4	97.9	9.9	8.3	1.5	3.4	0.9
31	20.9		107.2	1527.1		273.8		9.2		1.5	3.4	

WATER YEAR-1959

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	6.0	10.3	14.0	12.0	26.8	12.6	6.0	4.0	4.0	4.0	4.0
2	8.0	6.0	8.3	14.0	12.0	20.6	11.5	6.0	4.0	4.0	4.0	4.0
3	8.0	6.0	7.0	14.0	12.0	18.6	10.6	6.0	4.0	4.0	4.0	4.0
4	8.0	6.0	6.0	14.0	12.0	16.9	9.7	6.0	4.0	4.0	4.0	4.0
5	8.0	6.0	6.0	74.4	12.0	13.3	8.9	6.0	4.0	4.0	4.0	4.0
6	8.0	6.0	6.0	35.0	12.0	13.8	8.2	6.0	4.0	4.0	4.0	4.0
7	8.0	6.0	6.0	35.0	12.0	12.6	7.3	6.0	4.0	4.0	4.0	4.0
8	8.0	6.0	6.0	385.3	12.0	12.0	6.9	6.0	4.0	4.0	4.0	4.0
9	8.0	6.0	6.0	72.6	12.0	12.0	6.4	6.0	4.0	4.0	4.0	4.0
10	8.0	6.3	6.0	14.6	12.9	12.0	6.0	6.0	4.0	4.0	4.0	4.0
11	8.0	6.0	6.2	37.3	33.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
12	8.0	6.0	6.0	21.8	23.7	12.0	6.0	6.0	4.0	4.0	4.0	4.0
13	8.0	6.0	6.0	14.0	20.8	12.0	6.0	6.0	4.0	4.0	4.0	4.0
14	8.0	6.0	6.0	14.0	18.7	12.0	6.0	6.0	4.0	4.0	4.0	4.0
15	8.0	6.0	6.0	14.0	16.6	12.0	6.0	6.0	4.0	4.0	4.0	4.0
16	8.0	6.0	35.0	14.0	311.1	12.0	6.0	6.0	4.0	4.0	4.0	4.0
17	8.0	6.0	35.0	14.0	142.5	12.0	6.0	6.0	4.0	4.0	4.0	4.0
18	8.0	6.0	33.0	14.0	195.3	12.0	6.0	6.0	4.0	4.0	4.0	18.3
19	8.0	6.0	14.0	14.0	144.4	12.0	6.0	6.0	4.0	4.0	4.0	16.3
20	8.0	6.0	14.0	14.0	161.9	12.0	6.0	6.0	4.0	4.0	4.0	14.4
21	8.0	6.0	14.0	14.0	122.5	12.0	6.0	6.0	4.0	4.0	4.0	12.8
22	8.0	6.0	14.0	13.9	110.9	12.0	6.0	6.0	4.0	4.0	4.0	11.4
23	8.0	6.0	14.0	14.0	90.3	11.0	6.0	6.0	4.0	4.0	4.0	10.1
24	8.0	6.0	14.0	14.0	68.8	12.0	6.0	6.0	4.0	4.0	4.0	9.0
25	8.0	6.0	14.0	14.0	52.4	12.0	6.0	6.0	4.0	4.0	4.0	8.1
26	8.0	6.0	14.0	14.0	40.0	12.0	6.0	6.0	4.0	4.0	4.0	7.6
27	8.0	6.0	21.1	14.0	30.6	12.0	6.0	6.0	4.0	4.0	4.0	7.1
28	8.0	6.0	17.4	14.0	23.3	12.0	6.0	6.0	4.0	4.0	4.0	6.7
29	8.0	6.0	14.4	14.0		12.0	6.0	6.0	4.0	4.0	4.0	6.3
30	8.0	6.0	14.0	14.0		20.7	6.0	6.0	4.0	4.0	4.0	5.9
31	8.0		14.0	14.0		18.9		6.0		4.0	4.0	

WATER YEAR-1959

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.1	2.6	9.3	4.6	6.4	25.8	11.6	1.6	0.6	1.2	1.3	0.1
2	0.1	2.6	7.3	3.8	3.5	19.6	10.5	1.5	0.5	1.1	1.2	0.1
3	0.1	2.6	6.0	3.1	4.7	17.6	9.6	1.4	0.5	1.0	1.1	0.1
4	0.1	2.6	4.9	9.1	4.1	13.9	8.7	1.2	0.4	1.0	1.0	0.1
5	0.1	2.6	3.9	73.4	3.5	14.3	7.9	1.1	0.4	1.0	0.9	0.1
6	0.1	2.6	3.1	9.5	3.1	12.8	7.2	1.0	0.4	1.0	0.8	0.1
7	0.1	2.6	2.5	4.5	2.6	11.6	6.5	0.9	0.3	1.0	0.7	0.1
8	0.1	2.6	2.0	385.3	2.3	10.4	5.9	0.9	0.3	1.0	0.7	0.1
9	0.1	2.6	1.6	71.6	2.0	9.4	5.4	0.8	0.3	1.0	0.6	0.1
10	0.1	3.3	1.3	13.6	11.9	8.4	4.9	0.7	0.3	1.0	0.6	0.1
11	0.1	4.4	1.1	36.3	32.0	7.6	4.5	0.7	0.3	1.0	0.5	0.1
12	0.1	3.6	0.9	20.8	22.7	6.8	4.1	0.6	0.3	1.0	0.5	0.1
13	0.1	2.9	0.9	11.9	19.8	6.1	3.7	0.5	0.3	1.0	0.4	0.1
14	0.1	2.6	0.9	6.8	17.7	5.5	3.3	0.5	0.3	1.0	0.4	0.1
15	0.1	2.6	0.9	5.8	15.6	5.0	3.0	0.5	0.3	1.0	0.4	0.1
16	0.1	2.6	0.9	4.9	310.1	4.3	2.8	0.5	0.3	1.0	0.3	0.1
17	0.1	2.6	0.9	4.2	141.3	4.0	2.5	0.5	0.3	1.0	0.3	0.1
18	0.1	2.6	0.9	3.6	194.3	3.6	2.3	0.5	0.3	1.0	0.3	17.5
19	0.1	2.6	0.9	3.1	143.4	3.2	2.1	0.5	0.3	1.0	0.3	15.3
20	0.1	2.6	0.9	2.6	160.9	2.9	1.9	0.5	0.3	1.0	0.3	13.4
21	0.1	2.6	0.9	2.2	121.3	2.6	1.7	0.5	0.3	1.0	0.3	11.8
22	0.1	2.6	0.9	1.9	109.9	2.4	1.6	0.5	0.3	1.0	0.3	10.4
23	0.1	2.6	0.9	5.4	89.3	8.2	1.4	0.5	0.3	1.0	0.3	9.1
24	0.1	2.6	0.9	11.2	67.8	7.4	1.3	0.5	0.3	1.0	0.3	8.0
25	0.1	2.6	3.0	6.8	51.4	6.7	1.2	0.5	0.3	1.0	0.3	7.1
26	0.1	2.6	2.4	5.9	39.0	6.2	1.1	0.5	0.3	1.0	0.3	6.6
27	0.1	2.6	20.1	6.7	29.6	7.4	1.0	0.5	0.3	1.0	0.3	6.1
28	0.1	2.6	16.4	5.8	22.3	6.7	0.9	0.5	0.3	1.0	0.3	5.7
29	0.1	2.6	13.4	5.0		6.0	0.8	0.5	0.3	1.0	0.3	5.3
30	0.1	2.6	10.9	4.3		19.7	0.7	0.5	0.3	1.0	0.3	4.9
31	0.1		8.9	3.7		17.9		0.5		1.0	0.3	

WATER YEAR-1959

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.3	2.0	28.6	14.2	19.7	79.5	35.7	4.9	1.8	3.7	4.0	0.3
2	0.3	6.0	22.5	17.7	16.9	60.4	32.3	4.6	1.5	3.4	3.7	0.3
3	0.3	8.0	18.5	5.5	14.5	54.2	29.6	4.3	1.5	3.1	3.4	0.3
4	0.3	8.0	15.1	28.0	12.6	49.0	26.8	3.7	1.2	3.1	3.1	0.3
5	0.3	6.0	12.0	226.1	10.8	44.0	24.3	3.6	1.2	3.1	2.8	0.3
6	0.3	6.0	9.5	29.3	9.5	39.4	22.2	3.1	1.2	3.1	2.5	0.3
7	0.3	6.0	7.7	13.9	8.0	35.7	20.0	2.8	0.9	3.1	2.2	0.3
8	0.3	6.0	6.2	1156.7	7.1	32.0	18.2	2.8	0.9	3.1	2.2	0.3
9	0.3	6.0	4.9	220.5	6.2	29.0	16.6	2.5	0.9	3.1	1.8	0.3
10	0.3	16.9	4.0	41.9	36.7	25.9	15.1	2.2	0.9	3.1	1.8	0.3
11	0.3	13.4	3.4	112.4	98.6	23.4	13.9	2.2	0.9	3.1	1.5	0.3
12	0.3	11.1	2.8	64.1	69.9	20.9	12.6	1.8	0.9	3.1	1.5	0.3
13	0.3	8.9	2.8	36.7	61.0	18.8	11.4	1.5	0.9	3.1	1.2	0.3
14	0.3	8.0	2.8	20.9	54.5	16.9	10.2	1.5	0.9	3.1	1.2	0.3
15	0.3	8.0	2.8	17.9	48.0	15.4	9.2	1.5	0.9	3.1	1.2	0.3
16	0.3	8.0	2.8	15.1	955.1	13.9	8.6	1.5	0.9	3.1	0.9	0.3
17	0.3	8.0	2.8	12.9	335.2	12.3	7.7	1.5	0.9	3.1	0.9	0.3
18	0.3	8.0	2.8	11.1	593.4	11.1	7.1	1.5	0.9	3.1	0.9	33.9
19	0.3	8.0	2.8	9.5	441.7	9.9	6.5	1.5	0.9	3.1	0.9	47.1
20	0.3	8.0	2.8	8.0	495.6	8.9	5.9	1.5	0.9	3.1	0.9	41.3
21	0.3	8.0	2.8	6.8	274.2	8.0	5.2	1.5	0.9	3.1	0.9	36.3
22	0.3	8.0	2.8	5.9	338.5	7.4	4.9	1.5	0.9	3.1	0.9	32.0
23	0.3	8.0	2.8	4.6	275.0	6.5	4.3	1.5	0.9	3.1	0.9	28.0
24	0.3	8.0	2.8	34.5	208.8	5.6	4.0	1.5	0.9	3.1	0.9	24.6
25	0.3	8.0	2.8	26.9	158.3	4.7	3.7	1.5	0.9	3.1	0.9	21.9
26	0.3	8.0	2.8	18.2	120.1	3.9	3.4	1.5	0.9	3.1	0.9	20.3
27	0.3	8.0	2.8	11.9	91.2	3.1	3.1	1.5	0.9	3.1	0.9	18.8
28	0.3	8.0	2.8	50.5	69.3	2.6	2.8	1.5	0.9	3.1	0.9	17.6
29	0.3	8.0	2.8	41.3	15.4	2.5	2.5	1.5	0.9	3.1	0.9	16.3
30	0.3	8.0	2.8	33.6	13.2	2.2	2.2	1.5	0.9	3.1	0.9	15.1
31	0.3		27.6	11.4		55.1		1.5		3.1	0.9	

WATER YEAR=1960

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.0	6.4	4.0	66.5	23.9	21.1	8.0	3.0	3.0	3.0	3.0
2	4.0	4.0	3.4	4.0	102.7	23.9	19.4	8.0	3.0	3.0	3.0	3.0
3	4.0	4.0	4.6	4.0	73.5	22.1	18.3	8.0	3.0	3.0	3.0	3.0
4	4.0	4.0	4.0	4.0	60.8	20.4	17.0	8.0	3.0	3.0	3.0	3.0
5	4.0	4.0	4.0	4.0	219.3	18.9	13.9	8.0	3.0	3.0	3.0	3.0
6	4.0	4.0	4.0	4.0	86.8	17.7	14.8	8.0	3.0	3.0	3.0	3.0
7	4.0	4.0	4.0	4.0	65.4	16.1	13.8	8.0	3.0	3.0	3.0	3.0
8	4.0	4.0	4.0	4.0	1077.6	43.9	12.9	8.0	3.0	3.0	3.0	3.0
9	4.0	4.0	4.0	4.0	448.5	40.2	12.1	8.0	3.0	3.0	3.0	3.0
10	4.0	4.0	4.0	4.0	219.3	38.0	11.3	8.0	3.0	3.0	3.0	3.0
11	4.0	4.0	4.0	4.0	88.4	36.0	10.6	8.0	3.0	3.0	3.0	3.0
12	4.0	4.0	4.0	4.0	74.0	34.6	9.9	8.0	3.0	3.0	3.0	3.0
13	4.0	4.0	4.0	4.0	62.7	32.7	9.4	8.0	3.0	3.0	3.0	3.0
14	4.0	4.0	4.0	4.0	26.3	32.8	134.6	9.0	8.0	3.0	3.0	3.0
15	4.0	4.0	4.0	4.0	22.8	44.5	124.0	8.6	8.0	3.0	3.0	3.0
16	4.0	4.0	4.0	4.0	17.8	37.5	114.3	8.2	8.0	3.0	3.0	3.0
17	4.0	4.0	4.0	4.0	15.3	31.7	105.3	8.0	8.0	3.0	3.0	3.0
18	4.0	4.0	4.0	4.0	13.1	28.0	97.1	8.0	8.0	3.0	3.0	3.0
19	4.0	4.0	4.0	4.0	11.3	24.1	89.3	8.0	7.9	3.0	3.0	3.0
20	4.0	4.0	4.0	4.0	9.8	22.3	82.3	8.0	7.9	3.0	3.0	3.0
21	4.0	4.0	4.0	4.0	35.3	20.6	76.0	8.0	7.9	3.0	3.0	3.0
22	4.0	4.0	4.0	4.0	21.8	19.0	70.1	8.0	7.9	3.0	3.0	3.0
23	4.0	4.0	4.0	4.0	32.9	17.6	64.6	8.0	7.9	3.0	3.0	3.0
24	4.0	4.0	4.0	4.0	31.2	16.2	59.6	8.0	7.8	3.0	3.0	3.0
25	4.0	4.0	4.0	4.0	85.3	15.0	54.9	8.0	7.8	3.0	3.0	3.0
26	4.0	4.0	4.0	4.0	109.8	13.9	50.7	8.0	7.8	3.0	3.0	3.0
27	4.0	4.0	4.0	4.0	72.3	12.9	46.7	7.9	7.8	3.0	3.1	3.0
28	4.0	4.0	4.0	4.0	50.3	11.9	43.2	8.0	7.8	3.0	3.1	3.0
29	4.0	4.0	4.0	4.0	44.2	11.1	40.0	8.0	7.8	3.0	3.0	3.0
30	4.0	4.0	4.0	4.0	38.9		38.1	8.0	7.9	3.0	3.0	3.0
31	4.0		4.0	4.0	34.3	36.2		7.9		3.0	3.0	

WATER YEAR=1960

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	1.9	5.4	2.5	65.5	24.9	31.1	6.0	1.1	1.9	0.2	0.1
2	2.5	1.9	4.4	2.0	101.7	22.9	27.6	5.7	1.1	1.2	0.2	0.1
3	2.0	1.9	3.6	1.7	72.5	21.1	25.3	5.4	1.0	1.6	0.2	0.1
4	1.6	1.9	2.9	1.4	79.8	19.4	22.0	5.2	1.0	1.7	0.2	0.1
5	1.3	1.9	2.4	1.1	218.3	17.9	18.9	4.9	0.9	1.6	0.2	0.1
6	1.1	1.9	2.0	0.9	85.2	16.7	15.8	4.7	0.9	1.6	0.2	0.1
7	0.9	1.9	1.6	0.9	64.4	15.1	12.8	4.4	0.8	1.6	0.1	0.1
8	0.7	1.9	1.3	0.9	1076.6	12.9	11.9	4.2	0.8	1.6	0.1	0.1
9	0.6	1.9	1.1	0.9	447.5	11.1	11.1	4.0	0.8	1.6	0.1	0.1
10	0.5	1.9	0.9	0.9	218.5	10.0	10.3	3.8	0.7	1.6	0.1	0.1
11	0.4	1.9	0.7	0.9	87.4	9.0	8.9	3.6	0.7	1.6	0.1	0.1
12	0.3	1.9	0.7	0.9	73.3	7.6	7.6	3.4	0.7	1.6	0.1	0.1
13	0.3	1.9	0.7	0.9	61.7	145.1	2.4	3.3	0.6	1.6	0.1	0.1
14	0.2	1.9	0.7	0.9	23.2	51.2	133.6	2.0	3.1	0.6	1.6	0.1
15	0.2	1.9	0.7	0.9	19.7	43.5	123.0	2.6	2.9	0.6	1.6	0.1
16	0.2	1.9	0.7	0.9	16.2	36.5	113.3	2.2	2.8	0.5	1.6	0.1
17	0.2	1.9	0.7	0.9	14.3	30.7	104.3	2.7	2.7	0.5	1.6	0.1
18	0.2	1.9	0.7	0.9	12.1	27.0	96.1	2.5	2.5	0.5	1.6	0.1
19	0.2	1.9	0.7	0.9	10.3	23.1	184.5	2.2	2.4	0.5	1.6	0.1
20	0.2	1.9	0.7	0.9	8.8	21.3	171.5	2.3	2.3	0.4	1.6	0.1
21	0.2	1.9	0.7	0.9	34.3	19.6	159.0	2.2	2.4	0.4	1.6	0.1
22	0.2	1.9	0.7	0.9	70.8	18.0	147.1	2.1	2.1	0.4	1.6	0.1
23	0.2	1.9	0.7	0.9	31.9	16.4	135.6	2.1	2.0	0.4	1.6	0.1
24	0.2	1.9	0.7	0.9	50.2	15.2	124.6	1.9	1.9	0.4	1.6	0.1
25	0.2	1.9	0.7	0.9	84.3	14.0	114.9	1.8	1.8	0.3	1.6	0.1
26	0.2	1.9	0.7	0.9	108.8	12.6	105.7	1.7	1.7	0.3	1.6	0.1
27	0.2	1.9	0.7	0.9	71.3	11.9	91.7	1.6	1.6	0.3	1.6	0.1
28	0.2	1.9	0.7	0.9	49.5	10.9	83.2	1.5	1.5	0.3	1.6	0.1
29	0.2	1.9	0.7	0.9	43.2	10.1	75.0	1.4	1.4	0.3	1.6	0.1
30	0.2	1.9	0.7	0.9	37.9		67.1	1.4	1.4	0.3	1.6	0.1
31	0.2		0.7	0.9	33.5	35.2		1.3		1.6	0.0	

WATER YEAR=1960

NATURAL FLOW-NO. DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.2	5.9	16.6	7.7	201.7	76.7	61.9	18.5	3.4	5.9	0.6	0.3
2	7.7	5.9	10.6	6.2	313.2	70.5	57.3	17.6	3.4	5.5	0.6	0.3
3	6.2	5.9	11.1	5.2	223.3	63.0	53.3	16.6	3.1	5.3	0.6	0.3
4	4.9	5.9	8.9	4.3	245.8	59.8	49.3	16.0	3.1	5.2	0.6	0.3
5	4.0	5.9	7.4	3.4	672.4	55.1	45.9	15.1	2.8	4.9	0.6	0.3
6	3.4	5.9	6.2	2.8	264.3	51.4	42.5	14.5	2.8	4.9	0.6	0.3
7	2.8	5.9	4.9	2.8	198.4	108.1	39.4	13.6	2.5	4.9	0.3	0.3
8	2.2	5.9	4.0	2.8	3315.9	102.1	36.7	12.9	2.5	4.9	0.3	0.3
9	1.8	5.9	3.4	2.8	1378.3	120.7	34.2	12.3	2.3	4.9	0.3	0.3
10	1.5	5.9	2.8	2.8	673.0	114.0	31.7	11.7	2.2	4.9	0.3	0.3
11	1.2	5.9	2.2	2.8	269.2	107.8	29.6	11.1	2.2	4.9	0.3	0.3
12	0.9	5.9	2.2	2.8	223.8	239.0	27.4	10.5	2.2	4.9	0.3	0.3
13	0.9	5.9	2.2	2.8	190.0	446.9	25.9	10.2	1.8	4.9	0.3	0.3
14	0.6	5.9	2.2	2.8	71.5	159.3	41.5	24.6	1.8	4.9	0.3	0.3
15	0.6	5.9	2.2	2.8	60.7	134.0	378.8	23.4	1.8	4.9	0.3	0.3
16	0.6	5.9	2.2	2.8	51.7	112.4	349.0	22.2	1.8	4.9	0.3	0.3
17	0.6	5.9	2.2	2.8	44.0	94.6	321.2	21.3	1.8	4.9	0.3	0.3
18	0.6	5.9	2.2	2.8	37.3	83.2	296.0	20.0	1.8	4.9	0.3	0.3
19	0.6	5.9	2.2	2.8	31.7	71.1	272.6	19.1	1.8	4.9	0.3	0.3
20	0.6	5.9	2.2	2.8	27.1	65.6	251.0	18.2	1.8	4.9	0.3	0.3
21	0.6	5.9	2.2	2.8	105.6	60.4	231.0	17.2	1.8	4.9	0.3	0.3
22	0.6	5.9	2.2	2.8	218.1	55.4	212.8	16.3	1.8	4.9	0.3	0.3
23	0.6	5.9	2.2	2.8	159.9	51.1	195.9	15.7	1.8	4.9	0.3	0.3
24	0.6	5.9	2.2	2.8	154.6	46.8	180.5	14.8	1.8	4.9	0.3	0.3
25	0.6	5.9	2.2	2.8	239.6	43.1	166.0	14.2	1.8	4.9	0.3	0.3
26	0.6	5.9	2.2	2.8	335.1	39.7	153.1	13.2	1.8	4.9	0.3	0.3
27	0.6	5.9	2.2	2.8	219.6	36.7	140.8	12.6	1.8	4.9	0.3	0.3
28	0.6	5.9	2.2	2.8	152.5	33.6	130.0	12.0	1.8	4.9	0.3	0.3
29	0.6	5.9	2.2	2.8	133.1	31.1	120.1	11.4	1.8	4.9	0.3	0.3
30	0.6	5.9	2.2	2.8	116.7		114.3	10.8	1.8	4.9	0.3	0.3
31	0.6		2.2	2.8	103.2		108.4	10.0		4.9	0.0	

WATER YEAR=1961

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	6.6	106.5	8.4	102.2	10.0	23.6	8.8	4.0	6.7	4.0	4.0
2	5.0	5.5	19.3	8.4	74.3	10.0	21.7	8.4	4.0	3.9	4.0	4.0
3	5.0	4.6	10.7	8.3	53.9	10.0	19.9	8.0	4.0	3.9	4.0	4.0
4	5.0	4.0	10.0	8.3	38.5	10.0	18.3	7.7	4.0	3.8	4.0	4.0
5	5.0	4.0	10.0	8.2	27.6	10.0	16.8	7.3	4.0	3.9	4.0	4.0
6	11.3	4.0	10.0	8.2	20.1	14.1	15.4	7.0	4.0	3.9	4.0	4.0
7	9.3	4.0	10.0	8.2	18.0	12.9	14.2	6.7	4.0	3.9	4.0	4.0
8	7.7	4.0	10.0	8.2	16.2	11.8	13.0	6.4	4.0	3.9	4.0	4.0
9	6.4	4.0	10.0	8.2	197.7	30.3	12.0	6.2	4.0	3.9	4.0	4.0
10	5.3	4.0	10.0	8.2	75.3	25.8	11.4	4.0	4.0	3.9	4.0	4.0
11	5.0	4.0	10.0	8.2	147.5	21.6	10.8	6.0	4.0	3.9	4.0	4.0
12	5.0	21.9	10.0	8.2	54.3	18.1	10.3	6.0	4.0	4.0	3.9	4.0
13	5.0	79.4	10.0	8.2	42.5	15.2	10.0	6.0	4.1	4.0	4.0	4.0
14	5.0	65.0	10.0	8.2	34.0	14.2	9.5	6.0	4.0	4.0	4.0	4.0
15	5.0	53.3	10.0	8.2	46.0	201.9	9.0	6.0	4.1	4.0	4.0	4.0
16	5.0	43.7	10.0	8.2	36.6	82.5	8.6	6.0	4.0	4.0	4.0	4.0
17	5.0	35.9	10.0	8.2	28.9	132.6	8.2	6.0	4.0	4.0	3.9	4.0
18	5.0	29.5	10.0	8.2	22.8	55.7	7.8	6.0	4.1	4.0	3.9	4.0
19	5.0	24.4	10.0	8.2	20.8	50.3	7.4	6.0	4.0	4.0	3.9	4.0
20	5.0	20.1	10.0	8.2	18.9	56.4	7.1	6.0	4.0	4.0	4.0	4.0
21	5.0	16.6	10.0	8.2	17.2	51.1	6.7	6.0	4.1	4.0	4.0	4.0
22	5.0	13.8	9.7	8.2	15.7	46.3	6.8	6.0	4.0	4.0	4.0	4.0
23	5.0	11.5	9.5	8.2	14.3	43.1	7.2	6.0	4.0	4.0	4.0	4.0
24	5.0	9.6	9.3	8.2	13.0	39.6	6.9	6.0	4.0	4.0	3.9	4.0
25	5.0	317.7	9.1	8.3	11.9	65.1	6.6	6.0	4.1	4.0	4.0	4.0
26	5.0	1115.3	8.9	74.6	10.9	73.1	6.3	6.0	4.0	4.0	4.0	4.0
27	5.0	155.0	6.8	47.8	10.0	101.2	6.0	6.0	4.0	4.0	4.0	4.0
28	5.0	75.0	6.7	30.7	10.0	43.4	6.0	6.0	4.0	4.0	4.0	4.0
29	5.0	62.6	6.6	53.9	39.7	6.0	6.0	6.0	4.0	4.0	4.0	4.0
30	5.0	129.5	8.5	104.0	36.4	6.0	6.0	4.0	4.0	4.0	4.0	4.0
31	5.0		8.4	203.0	33.3	6.0				4.0		

WATER YEAR=1961

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.7	5.6	105.5	0.4	101.2	7.3	22.6	7.8	1.6	3.1	0.8	1.2
2	0.7	4.5	18.3	0.4	73.3	6.6	20.7	7.4	1.5	2.9	0.7	1.2
3	0.7	3.6	9.7	0.3	52.9	6.0	18.9	7.0	1.4	2.8	0.7	1.2
4	0.7	2.9	8.2	0.3	37.5	5.4	17.3	6.7	1.4	2.6	0.7	1.2
5	0.7	2.4	7.0	0.2	26.6	4.9	15.8	6.3	1.3	2.5	0.6	1.2
6	10.3	2.1	5.9	0.2	19.1	13.1	14.4	6.0	1.2	2.4	0.6	1.2
7	8.3	2.1	5.0	0.2	17.0	11.9	13.2	5.7	1.2	2.2	0.6	1.2
8	6.7	2.1	4.2	0.2	15.2	10.9	12.0	5.4	1.1	2.1	0.5	1.2
9	5.4	2.1	3.6	0.2	196.7	29.3	11.0	5.2	1.1	2.0	0.5	1.2
10	4.3	2.1	3.0	0.2	72.3	26.4	10.4	4.9	1.0	1.9	0.5	1.2
11	3.5	2.1	9.0	0.2	144.5	20.6	9.8	4.7	1.0	1.8	0.5	1.2
12	2.8	20.9	7.6	0.2	53.3	17.1	9.3	4.4	0.9	1.8	0.4	1.2
13	2.3	78.4	6.5	0.2	41.5	14.2	9.0	4.2	0.9	1.8	0.4	1.2
14	1.8	64.0	5.5	0.2	33.0	13.2	8.5	4.0	0.8	1.8	0.4	1.2
15	1.5	52.3	5.3	0.2	45.0	200.9	8.0	3.8	0.8	1.8	0.4	1.2
16	1.2	42.7	4.5	0.2	35.6	81.5	7.6	3.6	0.7	1.8	0.4	1.2
17	1.0	34.9	3.8	0.2	27.9	131.6	7.2	3.4	0.7	1.8	0.3	1.2
18	0.8	28.5	3.3	0.2	21.8	54.7	6.8	3.3	0.7	1.8	0.3	1.2
19	0.7	23.4	2.8	0.2	19.8	49.3	6.4	3.1	0.6	1.8	0.3	1.2
20	0.7	19.1	2.4	0.2	17.9	55.4	6.1	2.9	0.6	1.8	0.3	1.2
21	0.7	15.6	2.0	0.2	16.2	50.1	5.7	2.8	0.6	1.8	0.3	1.2
22	0.7	12.8	1.7	0.2	14.7	45.3	5.8	2.7	0.5	1.8	0.3	1.2
23	0.7	10.5	1.5	0.2	13.3	42.1	6.2	2.5	0.5	1.8	0.3	1.2
24	0.7	8.6	1.3	0.2	12.0	38.6	5.9	2.4	0.5	1.8	0.2	1.2
25	0.7	316.7	1.1	0.3	10.9	64.1	5.6	2.3	0.5	1.8	0.2	1.2
26	0.7	1114.3	0.9	73.6	9.9	72.1	5.3	2.2	0.4	1.8	0.2	1.2
27	0.7	154.0	0.8	46.8	8.9	100.2	5.0	2.1	0.4	1.8	0.2	1.2
28	0.7	74.0	0.7	29.7	8.1	42.4	4.8	2.0	0.4	1.8	0.2	1.2
29	0.7	61.6	0.6	52.9	38.7	6.0	4.6	1.9	0.4	1.8	0.2	1.2
30	0.7	128.5	0.5	103.0	35.4	4.3	4.3	1.8	0.4	1.8	0.2	1.2
31	0.7		0.4	202.0	32.3	1.7			1.8	0.2		

WATER YEAR=1961

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	17.2	324.9	1.2	311.7	22.5	69.6	24.0	4.9	9.5	2.5	3.7
2	2.2	13.9	56.4	1.2	225.8	20.3	63.8	22.8	4.6	8.9	2.2	3.7
3	2.2	11.1	29.9	0.9	162.9	18.5	58.2	21.6	4.3	8.6	2.2	3.7
4	2.2	8.9	25.3	0.9	115.5	16.6	53.3	20.6	4.3	8.0	2.2	3.7
5	2.2	7.4	21.6	0.6	81.9	15.1	48.7	19.4	4.0	7.7	1.8	3.7
6	31.7	6.5	18.2	0.6	58.8	40.3	44.4	18.5	3.7	7.4	1.8	3.7
7	25.6	6.5	15.4	0.6	52.4	36.7	40.7	17.6	3.7	6.8	1.8	3.7
8	20.6	6.3	12.9	0.6	46.8	33.3	37.0	16.6	3.4	6.5	1.5	3.7
9	16.6	6.5	11.1	0.6	605.8	90.2	33.9	16.0	3.4	6.2	1.5	3.7
10	13.2	6.3	9.2	0.6	222.7	76.4	32.0	15.1	3.1	5.9	1.3	3.7
11	10.8	6.3	27.7	0.6	451.2	63.4	20.2	14.5	3.1	5.5	1.3	3.7
12	8.6	64.4	23.4	0.6	164.2	52.2	13.6	13.6	2.8	5.5	1.2	3.7
13	7.1	241.5	20.0	0.6	127.8	43.7	11.9	11.9	2.8	5.5	1.2	3.7
14	5.9	197.1	16.9	0.6	101.6	40.7	10.2	10.2	2.5	5.5	1.2	3.7
15	4.6	161.1	16.3	0.6	138.6	61.8	24.6	24.6	2.5	5.5	1.2	3.7
16	3.7	131.5	13.9	0.6	109.6	251.0	23.4	23.4	2.2	5.5	1.2	3.7
17	3.1	107.5	11.7	0.6	85.9	405.3	22.2	22.2	2.2	5.5	0.9	3.7
18	2.5	87.8	10.2	0.6	67.1	151.8	19.7	19.7	1.8	5.5	0.9	3.7
19	2.2	72.1	8.6	0.6	61.0	151.8	18.8	18.8	1.8	5.5	0.9	3.7
20	2.2	58.8	7.4	0.6	55.1	170.6	17.6	17.6	1.8	5.5	0.9	3.7
21	2.2	48.0	6.2	0.6	49.9	154.3	17.9	17.9	1.5	5.5	0.9	3.7
22	2.2	39.4	5.2	0.6	45.3	139.5	17.9	17.9	1.5	5.5	0.9	3.7
23	2.2	32.3	4.6	0.6	41.0	129.7	17.1	17.1	1.5	5.5	0.9	3.7
24	2.2	26.5	4.0	0.6	37.0	118.9	18.2	18.2	1.5	5.5	0.6	3.7
25	2.2	975.4	3.4	0.9	33.6	197.4	17.2	17.2	1.5	5.5	0.6	3.7
26	2.2	3432.0	2.8	226.7	30.5	222.1	16.3	16.3	1.2	5.5	0.6	3.7
27	2.2	474.3	2.5	144.1	27.4	308.6	15.4	15.4	1.2	5.5	0.6	3.7
28	2.2	227.9	2.2	91.5	24.9	130.6	14.8	14.8	1.2	5.5	0.6	3.7
29	2.2	189.7	1.8	162.9	119.2	6.0	14.2	14.2	1.2	5.5	0.6	3.7
30	2.2	395.8	1.5	317.2	109.0	6.0	13.2	13.2	1.2	5.5	0.6	3.7
31	2.2		1.2	622.2	99.5	6.0			1.2	5.5	0.6	

WATER YEAR=1962

ENCARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	4.0	41.8	8.4	10.0	56.4	12.4	8.8	5.0	5.1	5.0	5.0
2	5.4	4.0	197.6	8.4	10.0	59.5	11.7	8.4	5.0	5.0	5.0	5.0
3	4.5	4.0	38.7	8.4	10.0	53.4	11.1	8.0	5.0	5.0	5.0	5.0
4	4.0	4.0	21.4	8.4	10.0	51.4	10.6	8.0	5.0	5.0	5.0	5.1
5	4.0	4.0	12.1	8.4	10.0	48.1	10.0	8.0	5.0	5.0	5.0	5.0
6	4.0	4.0	10.4	8.4	10.0	122.7	9.5	8.0	5.0	5.0	5.0	5.0
7	4.0	4.0	10.0	8.4	10.0	63.0	9.0	8.0	5.0	5.0	5.0	5.1
8	4.0	4.0	10.0	8.4	10.0	59.0	8.6	8.0	5.0	5.0	5.0	5.0
9	4.0	4.0	10.0	8.4	136.5	55.3	8.2	8.0	5.0	5.0	5.0	5.1
10	4.0	4.0	10.0	8.4	62.9	51.8	8.0	8.0	5.0	5.0	5.0	5.0
11	4.0	4.0	10.0	8.4	48.4	48.6	8.0	8.0	5.0	5.0	5.0	5.0
12	4.0	4.0	10.0	8.4	47.8	45.6	8.0	8.0	5.0	5.0	5.0	5.0
13	4.0	4.0	10.0	8.4	908.8	42.8	8.0	8.0	5.0	5.0	5.0	5.0
14	4.0	4.0	10.0	8.4	508.8	40.1	8.0	8.0	5.0	5.0	5.0	5.1
15	4.0	4.0	10.0	8.4	533.3	45.0	8.0	8.0	5.0	5.0	5.0	5.0
16	4.0	4.0	9.8	8.4	225.4	42.4	8.0	8.0	5.0	5.0	5.0	5.0
17	4.0	4.0	9.5	8.4	95.5	39.9	8.0	8.0	5.0	5.0	5.0	5.0
18	4.0	4.0	9.3	8.4	89.7	37.5	8.0	8.0	5.0	5.0	5.0	5.0
19	4.0	4.0	9.1	8.4	83.1	35.2	8.0	8.0	5.0	5.0	5.0	5.0
20	4.0	4.0	8.9	248.3	76.3	33.2	8.0	8.0	5.0	5.0	5.0	5.0
21	4.0	4.0	8.8	66.8	70.0	31.3	8.0	8.0	5.0	5.0	5.0	5.0
22	4.0	4.0	8.7	44.3	64.2	25.6	8.0	8.0	5.0	5.0	5.0	5.0
23	4.0	4.0	8.6	29.6	59.0	21.5	8.0	8.0	5.0	5.0	5.0	5.0
24	4.0	4.0	8.5	26.0	55.6	11.1	8.0	8.0	5.0	5.0	5.0	5.0
25	4.0	4.0	8.4	22.9	51.1	38.9	8.0	8.0	5.0	5.0	5.0	5.0
26	4.0	4.0	8.4	20.2	46.9	36.7	8.0	8.0	5.0	5.0	5.0	5.0
27	4.0	4.0	8.3	17.8	43.1	34.8	8.0	8.0	5.0	5.0	5.0	5.0
28	4.0	4.0	8.3	15.7	39.9	32.9	8.0	8.0	5.0	5.0	5.0	5.1
29	4.0	31.2	8.2	13.8	31.1	31.1	8.0	8.0	5.0	5.0	5.0	5.0
30	4.0	75.1	8.2	12.2	29.4	29.4	8.0	8.0	5.0	5.0	5.0	5.0
31	4.0		8.2	10.8	27.8	27.8	8.0	8.0	5.0	5.0	5.0	

WATER YEAR=1962

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	1.2	60.8	0.4	7.9	55.4	11.4	7.8	2.7	4.1	2.5	0.9
2	4.4	1.0	196.6	0.4	6.9	58.5	10.7	7.4	2.5	3.5	2.4	0.9
3	3.5	0.8	37.7	0.4	6.0	54.4	10.1	7.0	2.4	3.7	2.3	0.8
4	2.8	0.6	20.4	0.4	5.3	50.4	9.6	6.7	2.3	3.5	2.2	0.8
5	2.5	0.5	11.1	0.4	4.6	47.3	9.0	6.3	2.2	3.3	2.1	0.7
6	1.8	0.4	9.4	0.4	4.1	121.7	8.5	6.0	2.1	3.2	2.0	0.7
7	1.5	0.3	7.9	0.4	3.6	62.0	8.0	5.7	2.0	3.0	1.9	0.7
8	1.4	0.3	6.7	0.4	3.7	58.0	7.6	5.4	1.9	2.9	1.8	0.6
9	1.4	0.2	5.7	0.4	3.5	135.5	7.2	5.2	1.8	2.7	1.7	0.6
10	1.4	0.2	4.8	0.4	3.1	61.9	6.8	4.9	1.7	2.6	1.6	0.6
11	1.4	0.2	4.1	0.4	2.7	47.4	6.4	4.7	1.6	2.5	1.5	0.5
12	1.4	0.2	3.5	0.4	2.4	46.8	6.1	4.4	1.5	2.3	1.4	0.5
13	1.4	0.2	2.9	0.4	2.0	907.8	5.8	4.2	1.4	2.2	1.4	0.5
14	1.4	0.2	2.5	0.4	1.7	507.8	5.5	4.0	1.4	2.1	1.3	0.5
15	1.4	0.2	2.1	0.4	1.4	532.3	5.2	3.8	1.3	2.0	1.2	0.4
16	1.4	0.2	1.8	0.4	1.1	224.4	5.0	3.6	1.2	1.9	1.2	0.4
17	1.4	0.2	1.5	0.4	0.9	94.5	4.7	3.4	1.2	1.8	1.1	0.4
18	1.4	0.2	1.3	0.4	0.8	88.7	4.5	3.3	1.1	1.7	1.1	0.4
19	1.4	0.2	1.1	0.4	0.7	82.1	4.2	3.1	1.1	1.6	1.1	0.4
20	1.4	0.2	0.9	240.3	75.3	32.2	4.0	2.9	1.0	1.5	1.0	0.4
21	1.4	0.2	0.8	63.8	69.2	30.3	3.8	2.8	1.0	1.5	0.9	0.4
22	1.4	0.2	0.7	43.3	43.2	24.4	3.6	2.7	0.9	1.4	0.9	0.4
23	1.4	0.6	0.6	28.6	56.0	42.5	3.5	2.5	0.9	1.4	0.8	0.4
24	1.4	0.6	0.5	25.0	54.6	40.1	3.3	2.4	0.8	1.4	0.8	0.4
25	1.4	0.5	0.4	21.9	50.1	37.9	3.1	2.3	0.8	1.4	0.7	0.4
26	1.4	2.4	0.4	19.2	45.9	66.7	3.0	2.2	0.7	1.4	0.7	0.5
27	1.4	1.9	0.3	16.8	42.1	61.8	2.8	2.1	0.7	1.4	0.7	0.5
28	1.4	1.6	0.3	14.7	38.9	56.9	2.7	2.0	0.7	1.4	0.6	0.5
29	1.4	30.2	0.2	12.2	33.1	53.1	2.5	1.9	0.6	1.4	0.6	0.4
30	1.4	74.1	0.2	11.2	29.4	49.4	2.4	1.8	0.6	1.4	0.6	0.4
31	1.4		0.2	9.8	25.8	45.8	2.3	1.7	0.6	1.4	0.5	

WATER YEAR=1962

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.9	3.7	187.3	1.2	24.3	170.6	35.1	24.0	8.3	12.6	7.7	2.8
2	13.6	3.1	605.5	1.2	21.3	180.2	33.0	22.8	7.7	12.0	7.4	2.8
3	10.8	2.5	116.1	1.2	18.5	167.6	31.1	21.6	7.4	11.4	7.1	2.5
4	8.6	1.8	62.8	1.2	16.3	155.2	29.6	20.6	7.1	10.8	6.8	2.5
5	7.1	1.5	34.2	1.2	14.2	145.1	27.7	19.4	6.8	10.2	6.5	2.2
6	5.5	1.2	29.0	1.2	12.6	137.8	26.2	18.5	6.5	9.9	6.2	2.2
7	4.6	0.9	24.3	1.2	11.1	191.0	24.6	17.6	6.2	9.2	5.9	2.2
8	4.3	0.9	20.6	1.2	10.6	178.6	23.4	16.6	5.9	8.9	5.5	1.8
9	4.3	0.6	17.6	1.2	9.7	167.2	22.2	16.0	5.5	8.3	5.2	1.8
10	4.3	0.6	14.8	1.2	9.0	156.5	20.9	15.1	5.2	8.0	4.9	1.8
11	4.3	0.6	12.6	1.2	8.4	146.0	19.7	14.5	4.9	7.7	4.6	1.5
12	4.3	0.6	10.4	1.2	7.7	134.1	18.8	13.6	4.6	7.1	4.3	1.5
13	4.3	0.6	8.2	1.2	7.0	2796.0	17.9	12.9	4.3	6.8	4.0	1.5
14	4.3	0.6	6.0	1.2	6.3	1564.0	16.9	12.0	4.0	6.5	4.0	1.5
15	4.3	0.6	4.8	1.2	5.6	1639.5	16.0	11.7	4.0	6.2	3.7	1.2
16	4.3	0.6	3.5	1.2	4.9	691.2	15.4	11.1	3.7	5.9	3.7	1.2
17	4.3	0.6	2.3	1.2	4.2	291.1	14.5	10.5	3.7	5.5	3.4	1.2
18	4.3	0.6	1.0	1.2	3.5	273.2	13.9	10.2	3.4	5.2	3.4	1.2
19	4.3	0.6	0.7	1.2	2.8	252.9	12.9	9.9	3.4	4.9	3.4	1.2
20	4.3	0.6	0.4	740.1	231.9	99.2	12.3	8.9	3.1	4.6	3.1	1.2
21	4.3	0.6	0.3	202.7	212.5	93.0	11.7	8.6	3.1	4.6	2.8	1.2
22	4.3	0.6	0.2	133.4	194.7	137.4	11.1	8.3	2.8	4.3	2.8	1.2
23	4.3	1.8	0.1	88.1	178.6	130.9	10.8	7.7	2.8	4.3	2.5	1.2
24	4.3	1.8	0.1	77.0	168.2	123.5	10.2	7.4	2.5	4.3	2.5	1.2
25	4.3	1.5	0.1	67.5	154.0	116.7	9.5	7.1	2.5	4.3	2.2	1.2
26	4.3	7.4	0.1	59.1	141.4	110.0	9.2	6.8	2.2	4.3	2.2	1.5
27	4.3	5.9	0.1	51.7	129.7	104.1	8.6	6.5	2.2	4.3	2.2	1.5
28	4.3	4.9	0.1	45.3	119.8	98.0	8.3	6.2	2.2	4.3	1.8	1.5
29	4.3	93.0	0.1	39.4	92.7	92.7	7.7	5.9	1.8	4.3	1.8	1.2
30	4.3	228.2	0.1	34.5	87.5	87.5	7.4	5.5	1.8	4.3	1.8	1.2
31	4.3		0.1	30.2	82.5	82.5	7.2	5.2	1.8	4.3	1.5	

WATER YEAR=1963

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	5.0	18.1	14.0	733.0	15.2	39.0	23.6	12.0	8.0	8.0	8.0
2	5.0	5.0	16.1	14.0	325.9	14.5	37.1	22.5	12.0	8.0	8.0	8.0
3	5.0	5.0	50.2	14.0	145.1	13.8	35.1	21.4	12.0	8.0	8.0	8.0
4	5.0	5.0	35.0	14.0	65.0	13.2	33.8	20.4	12.0	8.0	8.0	8.0
5	5.0	5.0	24.5	14.0	60.9	12.6	33.5	19.4	12.0	8.0	8.0	8.0
6	5.0	5.0	17.2	14.0	57.2	12.0	328.4	18.5	12.0	8.0	8.0	8.0
7	5.0	5.0	15.3	14.0	53.7	12.0	189.5	17.6	12.0	8.0	8.0	8.0
8	5.0	5.0	14.0	14.0	58.7	12.0	95.2	16.8	12.0	8.0	8.0	8.0
9	5.0	5.0	14.0	14.0	69.4	12.0	94.4	16.0	12.0	8.0	8.0	8.0
10	5.0	5.0	14.0	14.0	100.5	12.0	97.1	15.2	12.0	8.0	8.0	8.0
11	5.0	5.0	14.0	14.0	46.6	12.0	92.6	14.5	12.0	8.0	8.0	8.0
12	466.5	5.0	14.0	14.0	44.1	12.0	88.0	13.8	12.0	8.0	8.0	8.0
13	547.1	5.0	15.3	14.0	112.1	12.0	102.3	13.2	12.0	8.0	8.0	8.0
14	259.0	5.0	50.7	14.0	51.9	12.0	182.1	12.6	12.0	8.0	8.0	8.0
15	66.1	5.0	321.2	14.0	49.3	12.0	120.1	12.0	12.0	8.0	8.0	8.0
16	17.4	5.0	269.6	14.0	46.9	26.4	62.2	12.0	8.0	8.0	8.0	8.0
17	11.4	5.0	155.8	13.8	43.2	25.1	59.2	12.0	8.0	8.0	8.0	8.0
18	7.9	5.0	63.2	13.7	43.0	23.9	56.2	12.0	8.0	8.0	8.0	8.0
19	6.7	5.0	51.7	13.5	40.9	22.8	125.0	12.0	8.0	8.0	8.0	8.0
20	5.9	5.0	42.3	13.4	38.9	21.7	65.5	12.0	8.0	8.0	8.0	8.0
21	5.3	5.0	34.7	13.3	35.2	19.7	59.2	11.8	8.0	8.0	8.0	8.0
22	5.0	5.0	28.5	13.2	33.2	17.7	56.3	12.0	8.0	8.0	8.0	8.0
23	5.0	5.0	23.4	13.1	33.5	16.7	53.5	12.0	8.0	8.0	8.0	8.0
24	5.0	5.0	19.2	13.0	31.9	15.3	51.4	12.0	8.0	8.0	8.0	8.0
25	5.0	5.0	17.7	12.9	30.3	14.3	48.4	12.0	8.0	8.0	8.0	8.0
26	5.0	5.0	16.2	12.8	28.9	13.1	44.4	12.0	8.0	8.0	8.0	8.0
27	5.0	5.0	14.9	12.7	27.3	12.1	41.2	12.0	8.0	8.0	8.0	8.0
28	5.0	5.0	14.0	12.6	26.2	11.0	38.2	12.0	8.0	8.0	8.0	8.0
29	5.0	5.0	14.0	12.6	25.0	10.0	35.3	12.0	8.0	8.0	8.0	8.0
30	5.0	21.6	14.0	12.6	23.0	9.0	32.6	12.0	8.0	8.0	8.0	8.0
31	5.0	5.0	14.0	12.6	21.0	8.0	30.0	12.0	8.0	8.0	8.0	8.0

WATER YEAR=1963

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.4	1.6	17.1	7.6	2244.0	32.2	103.0	51.6	6.7	3.3	2.9	3.2
2	0.3	1.4	15.1	7.1	989.9	30.5	97.1	47.5	6.4	3.1	2.7	3.1
3	0.3	1.2	49.2	6.5	432.1	17.3	91.1	43.4	6.0	3.0	2.6	2.9
4	0.2	1.1	34.0	5.9	186.0	27.2	86.8	43.4	5.7	2.8	2.5	2.8
5	0.2	0.9	23.5	5.4	173.9	25.6	85.5	41.4	5.4	2.7	2.3	2.6
6	0.1	0.8	16.2	4.9	162.2	24.0	993.4	39.5	5.2	2.6	2.2	2.5
7	0.1	0.7	14.3	4.5	161.7	22.5	565.5	37.6	4.9	2.4	2.1	2.4
8	0.1	0.6	12.6	4.1	168.7	20.9	275.2	35.8	4.7	2.3	2.0	2.3
9	0.1	0.5	11.2	3.8	264.4	19.4	272.4	34.0	4.4	2.2	1.9	2.2
10	0.2	0.5	9.9	3.4	183.5	18.0	272.1	32.2	4.2	2.1	1.8	2.0
11	4.0	0.4	8.7	3.1	126.6	16.5	261.6	30.5	4.0	2.0	1.7	1.9
12	465.5	0.4	7.7	2.9	263.1	15.1	253.0	28.8	3.8	1.9	1.6	1.8
13	546.1	0.4	14.3	2.6	206.1	12.7	297.3	27.2	3.6	1.8	1.5	1.8
14	258.0	0.4	49.7	2.4	141.9	10.3	542.1	23.6	3.4	1.7	1.5	1.7
15	65.1	0.4	320.2	2.2	135.3	12.9	352.1	19.0	3.3	1.6	1.4	1.6
16	16.4	0.4	268.6	2.0	128.9	66.4	173.2	14.5	3.1	1.5	1.3	1.5
17	10.4	0.4	154.8	1.8	123.2	62.1	164.2	11.9	2.9	1.5	1.3	1.4
18	6.5	0.4	62.2	1.7	117.0	57.9	155.2	10.4	2.8	1.4	1.2	1.4
19	5.7	0.4	50.7	1.5	110.9	53.8	167.0	9.0	2.7	1.3	1.2	1.3
20	4.9	0.4	41.3	1.4	104.9	50.7	183.5	8.5	2.5	1.3	1.1	1.2
21	4.3	0.4	33.7	1.3	100.6	47.6	174.2	8.1	2.4	1.2	1.0	1.2
22	3.7	0.4	27.5	1.2	95.2	45.7	165.2	7.7	2.3	1.1	1.0	1.1
23	3.2	0.4	22.4	1.1	90.5	44.7	156.3	7.3	2.2	1.1	0.9	1.0
24	2.8	0.4	18.2	1.0	85.9	42.5	147.5	6.9	2.1	1.0	0.9	1.0
25	2.4	0.4	16.7	0.9	81.3	39.3	140.4	6.6	2.0	1.0	0.9	1.0
26	2.1	0.4	15.2	0.8	76.9	36.1	130.4	6.3	1.9	0.9	0.9	1.0
27	1.8	0.4	13.9	0.7	71.3	33.1	120.2	6.0	1.8	0.9	0.9	1.0
28	1.6	0.4	12.7	0.7	66.2	30.6	112.2	5.7	1.7	0.8	0.9	1.0
29	1.4	0.4	11.6	0.6	61.7	27.9	104.9	5.4	1.6	0.8	0.9	1.0
30	1.2	0.4	10.6	0.6	57.0	25.0	97.5	5.1	1.5	0.7	0.9	1.0
31	1.0	0.4	9.7	0.6	52.4	22.2	90.0	4.8	1.4	0.7	0.9	1.0

WATER YEAR=1963

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	4.9	52.7	24.0	2254.6	43.7	117.0	69.6	20.6	10.2	8.9	9.9
2	0.9	4.3	46.5	21.9	1000.7	41.6	111.2	64.2	19.7	9.9	8.3	9.3
3	0.9	3.7	151.5	20.0	443.8	3.5	105.0	62.8	18.5	9.2	8.0	8.9
4	0.6	3.4	104.7	18.2	197.1	37.6	101.0	59.8	17.6	8.6	7.7	8.6
5	0.6	2.8	72.4	16.6	184.5	35.7	100.1	56.7	16.6	8.3	7.1	8.0
6	0.3	2.5	49.9	15.1	173.1	33.9	1008.4	53.9	16.0	8.0	6.8	7.7
7	0.3	2.2	44.0	13.9	162.3	32.3	580.6	51.1	15.1	7.4	6.5	7.4
8	0.3	1.8	38.8	12.6	177.7	30.5	290.1	48.7	14.5	7.1	6.2	7.1
9	0.3	1.5	34.5	11.7	210.7	29.0	287.7	46.2	13.6	6.8	5.9	6.8
10	0.6	1.3	30.5	10.5	306.5	27.7	296.0	43.7	12.9	6.5	5.5	6.2
11	2.3	1.2	26.8	9.5	140.4	26.2	282.1	41.6	12.3	6.2	5.2	5.9
12	3.7	1.2	23.7	8.9	132.7	24.9	268.0	39.4	11.7	5.9	4.9	5.5
13	5.0	1.2	20.7	8.0	124.2	23.7	254.0	37.6	11.1	5.5	4.9	5.5
14	4.6	1.2	183.1	7.4	156.8	22.5	357.8	35.7	10.5	5.2	4.6	5.2
15	200.5	1.2	986.2	6.8	148.8	24.3	366.8	33.9	10.2	4.9	4.3	4.9
16	50.5	1.2	827.3	6.2	141.4	22.5	188.5	32.3	9.5	4.6	4.0	4.6
17	32.0	1.2	476.8	5.5	136.1	74.2	179.3	30.5	8.9	4.6	4.0	4.3
18	20.0	1.2	191.6	5.2	129.4	70.5	170.0	29.0	8.6	4.3	3.7	4.3
19	17.6	1.2	156.2	4.6	122.9	67.1	381.9	27.7	8.3	4.0	3.7	4.0
20	15.1	1.2	127.2	4.3	116.7	63.8	198.7	26.2	7.7	4.0	3.4	3.7
21	13.2	1.2	103.8	4.0	110.9	60.4	188.5	24.9	7.4	3.7	3.1	3.7
22	11.4	1.2	84.7	3.7	105.3	57.6	179.3	23.7	7.1	3.4	3.1	3.4
23	9.9	1.2	69.0	3.4	100.1	79.2	170.3	22.5	6.8	3.4	2.8	3.4
24	8.6	1.2	56.1	3.1	95.2	75.5	161.7	21.3	6.5	3.1	2.8	3.1
25	7.4	1.2	51.4	2.8	90.2	71.8	155.2	20.3	6.2	3.1	2.8	3.1
26	6.5	1.2	46.8	2.5	85.9	68.1	155.3	19.4	5.9	2.8	2.8	3.5
27	5.5	1.2	42.8	2.2	81.0	60.4	185.4	18.5	5.5	2.8	2.8	3.5
28	4.9	1.2	37.1	2.0	77.6	1059.2	176.2	17.6	5.2	2.5	2.8	3.2
29	4.3	1.2	35.7	1.8	72.4	520.2	167.2	16.6	4.9	2.5	2.8	4.9
30	3.7	1.2	32.6	1.6	68.0	252.6	158.9	15.7	4.6	2.2	2.8	4.6
31	3.1	1.2	29.9	1.5	64.0	122.9	148.0	14.8	4.3	2.2	2.8	4.3

WATER YEAR-1967

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	3.0	103.1	12.0	307.6	16.8	187.7	31.9	12.0	8.0	8.0	8.0
2	5.0	3.0	87.3	12.0	140.4	16.0	87.1	45.3	12.0	8.0	8.0	8.0
3	5.0	3.0	323.3	12.0	133.8	16.0	84.3	41.2	35.8	8.0	8.0	8.0
4	5.0	3.0	110.6	12.0	126.4	16.0	79.3	38.0	34.1	8.0	8.0	8.0
5	5.0	3.0	382.6	12.0	118.1	16.0	76.8	34.9	32.4	8.0	8.0	8.0
6	5.0	3.0	189.6	12.0	110.9	16.0	239.7	30.8	30.9	8.0	8.0	8.0
7	5.0	3.0	76.4	12.0	104.8	16.0	119.6	27.8	29.4	8.0	8.0	8.0
8	5.0	3.0	72.7	12.0	438.8	16.0	112.3	22.8	27.9	8.0	7.9	8.0
9	5.0	3.0	60.1	12.0	92.9	16.0	105.1	20.8	26.6	8.0	7.9	8.0
10	5.0	3.0	87.8	12.0	89.1	16.0	99.0	18.9	25.3	8.0	7.9	8.0
11	5.0	3.0	73.9	12.0	81.4	16.0	163.4	17.1	24.1	8.0	7.9	8.0
12	5.0	3.0	62.3	12.0	73.8	17.0	78.3	16.3	22.9	8.0	7.9	8.0
13	5.0	3.0	52.6	12.0	71.2	16.0	73.6	15.5	21.8	8.0	8.0	8.0
14	5.0	3.0	44.3	12.0	66.8	18.0	71.1	14.8	20.8	8.0	7.9	8.0
15	5.0	3.0	37.6	12.0	63.4	17.2	68.9	14.1	19.8	8.0	7.8	8.0
16	5.0	3.0	31.8	12.0	59.1	137.2	65.3	13.5	18.9	8.0	7.8	8.0
17	5.0	3.0	27.0	12.0	54.8	130.9	121.7	12.8	18.0	8.0	7.9	8.0
18	5.0	3.0	22.9	12.0	51.6	126.6	130.7	12.2	17.1	7.9	7.9	8.0
19	5.0	3.0	19.4	11.9	48.3	121.2	124.2	12.0	16.3	8.0	7.9	8.0
20	5.0	3.0	17.3	11.7	44.4	116.2	114.8	12.0	15.6	8.0	7.9	8.0
21	5.0	114.4	14.0	2253.3	41.4	423.4	124.7	12.0	14.8	8.0	7.9	8.0
22	5.0	36.2	13.0	1841.4	38.4	313.3	117.3	12.0	14.1	8.0	8.0	8.0
23	5.0	22.7	12.0	832.9	35.3	150.3	110.0	12.0	13.5	8.0	7.9	8.0
24	5.0	14.3	12.0	2279.9	32.6	140.6	102.8	12.0	12.9	8.0	8.0	8.0
25	5.0	12.0	12.0	1058.4	29.8	132.9	95.7	12.0	12.3	8.0	8.0	8.0
26	5.0	12.0	12.0	481.0	27.0	123.4	88.7	12.0	11.7	8.0	8.0	8.0
27	5.0	12.0	12.0	603.8	24.3	118.0	82.8	12.0	11.2	8.0	8.0	8.0
28	5.0	13.4	12.0	321.4	22.3	110.7	77.0	12.0	10.7	8.0	8.0	8.0
29	5.0	70.3	12.0	1775.1		123.2	71.3	12.0	10.2	8.0	8.0	8.0
30	5.0	19.8	12.0	1340.0		117.6	65.7	12.0	9.7	8.0	8.0	8.0
31	5.0		12.0	819.6		668.0		12.0		8.0	8.0	

WATER YEAR-1967

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	4.9	0.3	102.1	8.2	313.6	24.8	197.7	64.9	3.2	3.3	2.9	1.7	
2	4.0	0.3	66.3	7.5	146.6	23.2	97.1	61.5	3.0	3.1	2.7	1.6	
3	3.2	0.2	322.5	6.9	138.2	21.6	93.3	53.2	34.2	3.0	2.6	1.6	
4	2.5	0.2	109.6	6.4	131.4	20.1	88.5	55.0	33.1	2.8	2.5	1.5	
5	2.0	0.1	381.6	5.9	119.1	18.6	85.8	51.9	31.4	2.7	2.3	1.4	
6	1.6	0.1	187.6	5.4	112.9	17.1	249.7	48.8	29.9	2.6	2.2	1.3	
7	1.3	0.1	75.4	5.0	107.8	15.7	122.6	45.8	28.4	2.4	2.1	1.3	
8	1.1	0.1	71.7	4.6	442.8	14.2	122.3	42.8	26.9	2.3	2.0	1.2	
9	0.9	0.1	55.1	4.2	97.9	12.8	115.1	39.8	25.6	2.2	1.9	1.1	
10	0.9	0.1	56.6	3.9	93.1	11.4	108.0	36.9	24.3	2.1	1.8	1.1	
11	0.9	0.1	72.9	3.6	88.4	14.6	174.4	34.1	23.1	2.0	1.7	1.0	
12	0.9	0.1	61.3	3.3	83.8	17.5	87.3	31.3	21.9	1.9	1.6	1.0	
13	0.9	0.1	51.6	3.0	79.2	31.0	22.6	28.5	20.2	1.8	1.6	0.9	
14	0.9	0.1	43.5	2.8	74.8	40.0	81.1	25.8	19.2	1.7	1.5	0.9	
15	0.9	0.1	36.6	2.6	70.4	38.2	79.9	23.1	18.8	1.6	1.4	0.8	
16	0.9	0.1	30.8	2.4	66.1	145.2	75.3	20.5	17.9	1.5	1.3	0.8	
17	0.9	0.1	26.0	2.2	62.8	138.9	131.7	17.8	17.0	1.5	1.3	0.8	
18	0.9	0.1	21.9	2.0	59.6	134.6	140.7	15.2	16.1	1.4	1.2	0.7	
19	0.9	0.1	16.4	1.9	56.5	127.2	133.2	12.7	15.3	1.3	1.2	0.7	
20	0.9	0.1	15.5	1.7	53.4	124.2	125.8	11.1	14.6	1.2	1.1	0.6	
21	0.9	0.1	113.4	1.0	3152.5	50.4	435.4	134.7	9.6	13.8	1.2	1.0	0.6
22	0.9	0.1	35.2	1.0	5656.4	47.4	325.5	127.3	9.2	13.1	1.1	1.0	0.6
23	0.9	0.1	21.7	1.0	2550.9	44.5	162.5	121.0	8.7	12.5	1.1	0.9	0.6
24	0.9	0.1	13.3	1.0	2266.9	41.6	152.8	113.8	8.3	11.9	1.0	0.9	0.5
25	0.9	0.1	8.2	0.9	1043.4	38.8	144.9	107.7	7.8	11.3	1.0	0.9	0.5
26	0.9	0.1	5.0	0.8	481.0	36.0	137.4	100.7	7.5	10.7	0.9	0.9	1.0
27	0.9	0.1	4.4	0.7	603.8	33.3	130.0	94.8	7.1	10.2	0.9	0.9	0.9
28	0.9	0.1	12.4	0.7	321.4	30.5	122.7	90.0	6.7	9.7	0.8	0.9	0.9
29	0.9	0.1	15.3	0.7	1775.1	136.2	84.3	6.4	9.2	0.8	0.9	0.8	0.8
30	0.9	0.1	18.2	0.7	1340.0	131.6	79.7	6.1	8.7	0.7	0.9	0.8	0.8
31	0.9	0.1	1821.6	0.7	681.0	5.3	0.7	0.7	0.7	0.7	0.9	0.8	0.8

WATER YEAR-1967

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	15.1	0.9	314.5	25.3	325.2	36.3	211.6	82.9	9.9	10.2	8.9	5.2	
2	12.3	0.9	265.8	23.1	198.3	34.5	111.2	78.5	9.2	9.5	8.3	4.9	
3	9.9	0.6	993.3	21.3	150.3	32.6	108.7	74.5	107.2	9.2	8.0	4.9	
4	7.7	0.6	337.6	19.7	142.9	31.1	103.2	70.8	101.9	8.6	7.7	4.6	
5	6.2	0.3	1173.3	18.2	135.8	29.6	101.0	67.5	96.7	8.3	7.1	4.3	
6	4.9	0.3	577.8	16.6	129.1	28.0	264.0	64.1	92.1	8.0	6.8	4.0	
7	4.0	0.3	232.2	15.4	122.6	26.8	143.5	61.0	87.5	7.4	6.5	4.0	
8	3.4	0.3	220.8	14.2	1163.6	25.3	136.4	57.9	82.9	7.1	6.2	3.7	
9	2.8	0.3	182.0	12.9	110.6	24.0	129.7	54.8	78.8	6.8	5.9	3.4	
10	2.8	0.3	267.3	12.0	105.0	23.4	123.2	52.1	74.8	6.5	5.3	3.4	
11	2.6	0.3	224.5	11.1	99.8	26.5	189.1	49.6	71.1	6.2	5.2	3.1	
12	2.8	0.3	188.8	10.2	94.9	29.3	102.6	47.1	67.5	5.9	4.9	3.1	
13	2.8	0.3	158.9	9.2	89.9	43.1	97.3	44.7	64.1	5.5	4.9	2.8	
14	2.8	0.3	134.0	8.6	85.6	32.4	93.8	42.5	61.0	5.2	4.6	2.8	
15	2.8	0.3	271.3	8.0	81.3	49.9	93.2	40.3	57.9	4.9	4.3	2.5	
16	2.8	0.3	266.1	7.4	77.3	157.7	90.2	38.5	55.1	4.6	4.0	2.5	
17	2.8	0.3	40.7	6.8	73.3	150.6	146.9	36.3	52.4	4.6	4.0	2.5	
18	2.8	0.3	20.3	6.2	69.6	146.6	156.2	34.5	49.6	4.3	3.7	2.2	
19	2.8	0.3	24.0	5.9	66.2	139.2	148.5	33.0	47.1	4.0	3.7	2.2	
20	2.8	0.3	1282.2	4.7	5.2	62.8	136.1	141.1	31.1	45.0	3.7	3.4	1.8
21	2.8	0.3	349.3	40.0	6937.7	59.8	447.8	150.0	29.6	42.5	3.7	3.1	1.8
22	2.8	0.3	108.4	37.0	5668.4	56.7	337.3	142.6	28.3	40.3	3.4	3.1	1.8
23	2.8	0.3	66.8	33.9	2562.3	53.9	174.0	133.5	26.8	38.5	3.4	3.1	1.8
24	2.8	0.3	41.0	31.4	2278.9	51.1	165.1	128.7	25.6	36.7	3.1	2.8	1.5
25	2.8	0.3	25.3	28.6	1057.7	48.7	156.8	122.3	24.0	34.8	3.1	2.8	1.5
26	2.8	0.3	15.4	26.5	492.8	46.2	149.1	116.1	23.1	33.0	2.8	2.8	1.5
27	2.8	0.3	13.6	24.3	615.4	44.0	141.7	110.3	21.9	31.4	2.8	2.8	1.5
28	2.8	0.3	38.2	22.5	333.9	41.6	134.6	104.7	20.6	29.9	2.5	2.8	1.5
29	2.8	0.3	213.4	20.6	1786.7	148.5	99.5	19.7	28.3	2.5	2.8	2.5	2.5
30	2.8	0.3	57.9	19.1	1352.1	143.5	94.6	18.8	26.8	2.2	2.8	2.5	2.5
31	2.6	0.3	17.6	17.6	833.4	693.0	17.9	17.9	2.2	2.8	2.8	2.5	2.5

WATER YEAR=1968

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	9.4	35.0	12.9	89.5	34.4	11.0	8.0	5.0	3.0	5.0	5.0
2	8.0	7.8	35.0	12.8	75.5	31.1	10.4	8.0	5.0	3.0	5.0	5.0
3	8.0	6.5	14.0	12.7	71.1	28.1	9.7	8.0	5.0	3.0	5.0	5.0
4	8.0	6.0	14.0	12.6	54.2	25.4	9.1	8.0	5.0	3.0	5.0	5.0
5	8.0	6.0	88.5	12.5	41.4	23.2	8.5	8.0	5.0	3.0	5.0	5.0
6	8.0	6.0	35.0	12.4	31.7	21.0	8.0	8.0	5.0	3.0	5.0	5.0
7	8.0	6.0	36.0	12.3	24.3	21.9	8.0	8.0	5.0	3.0	5.0	5.0
8	8.0	6.0	14.0	12.3	18.7	20.7	8.0	8.0	5.0	3.0	5.0	5.0
9	8.0	6.0	14.0	12.3	17.0	18.8	8.0	8.0	5.0	3.0	5.0	5.0
10	8.0	6.0	14.0	40.6	15.4	17.1	8.0	8.0	5.0	3.1	5.0	5.0
11	8.0	6.0	14.0	35.0	13.9	15.6	8.0	8.0	5.0	3.0	5.0	5.0
12	8.0	6.0	14.0	35.0	12.6	14.2	8.0	8.0	5.0	3.0	5.0	5.0
13	8.0	6.0	14.0	15.9	12.0	72.5	8.0	8.0	5.0	3.0	5.0	5.0
14	8.0	11.4	13.7	17.3	12.0	67.7	8.0	8.0	5.0	3.0	5.0	5.0
15	8.0	9.4	13.5	196.2	12.0	62.2	8.0	8.0	5.0	3.0	5.0	5.0
16	8.0	7.8	13.2	55.7	12.0	128.1	8.0	8.0	5.0	3.0	5.0	5.0
17	8.0	6.3	13.0	37.1	109.4	57.6	8.0	8.0	5.0	3.0	5.0	5.0
18	8.0	6.0	15.4	24.8	90.2	53.3	8.0	8.0	5.0	3.0	5.0	5.0
19	8.0	6.0	14.0	16.7	74.3	49.3	8.0	8.0	5.0	3.0	5.0	5.0
20	8.0	6.0	14.0	14.8	178.1	45.6	8.0	8.0	5.0	3.0	5.0	5.0
21	8.0	6.0	14.0	14.0	184.3	42.2	8.0	8.0	5.0	3.0	5.0	5.0
22	8.0	6.0	14.0	14.0	77.3	39.0	8.0	8.0	5.0	3.0	5.0	5.0
23	8.0	6.0	14.0	14.0	97.6	39.3	8.0	8.0	5.0	3.0	5.0	5.0
24	8.0	6.0	14.0	14.0	88.0	36.4	8.0	8.0	5.0	3.0	5.0	5.0
25	8.0	6.0	14.0	14.0	79.4	34.5	8.0	8.0	5.0	3.0	5.0	5.0
26	8.0	6.0	13.7	14.0	71.7	32.0	8.0	8.0	5.0	3.0	5.0	5.0
27	8.0	6.0	13.5	14.0	64.7	29.7	8.0	8.0	5.0	3.0	5.0	5.0
28	8.0	6.0	13.3	14.0	58.4	27.5	8.0	8.0	5.0	3.0	5.0	5.0
29	8.0	6.0	13.1	26.2	52.7	25.5	8.0	8.0	5.0	3.0	5.0	5.0
30	8.0	37.2	12.9	253.9	23.7	23.7	8.0	8.0	5.0	3.0	5.0	5.0
31	8.0		12.8	92.4		22.0	8.0		3.0	5.0		

WATER YEAR=1968

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	8.4	4.9	0.9	85.5	33.4	12.0	5.2	1.6	1.2	1.8	2.2
2	3.0	6.8	2.2	0.8	74.5	30.1	9.4	5.0	1.3	1.1	1.8	2.1
3	2.5	5.3	9.0	0.7	70.1	71.1	8.7	4.7	1.4	1.1	1.7	1.9
4	2.0	4.4	4.2	0.6	53.2	39.4	5.1	4.3	1.3	1.0	1.6	1.9
5	1.6	3.6	87.5	0.5	40.4	35.2	7.5	4.3	1.3	1.0	1.5	1.8
6	1.3	2.9	14.6	0.4	30.7	25.0	6.9	4.1	1.2	0.9	1.4	1.7
7	1.3	2.3	21.4	0.3	23.3	23.9	6.6	3.9	1.2	0.9	1.4	1.6
8	1.3	1.9	11.5	0.3	17.7	21.7	6.3	3.7	1.1	0.8	1.3	1.5
9	1.3	1.6	6.2	0.3	16.0	17.8	6.0	3.5	1.0	0.8	1.2	1.4
10	1.3	1.6	3.3	35.6	14.4	16.1	5.7	3.3	1.0	0.8	1.2	1.4
11	1.3	1.6	2.8	24.5	12.9	14.8	5.4	3.1	0.9	0.7	1.1	1.3
12	1.3	1.6	2.4	15.2	11.6	13.2	5.1	3.0	0.9	0.7	1.0	1.2
13	1.3	1.6	2.0	14.9	10.5	14.0	4.8	2.8	0.8	0.7	1.0	1.2
14	1.3	10.4	1.7	16.3	9.4	129.7	4.6	2.7	0.8	0.7	0.9	1.1
15	1.3	8.4	1.5	195.2	8.5	117.2	4.4	2.6	0.8	0.7	0.9	1.1
16	1.3	6.8	1.2	54.7	10.8	265.1	4.2	2.4	0.7	0.7	0.9	1.0
17	1.3	5.5	1.0	36.1	108.4	106.6	3.9	2.3	0.7	0.7	0.8	1.0
18	1.3	4.5	14.4	21.8	89.2	97.3	3.8	2.2	0.7	0.7	0.8	0.9
19	1.3	3.7	8.1	15.7	73.3	88.3	3.6	2.1	0.6	0.7	0.8	0.9
20	1.3	3.0	4.6	13.8	177.1	79.6	3.4	2.0	0.6	0.7	0.7	0.8
21	1.3	2.4	3.9	12.1	163.3	72.2	3.2	1.9	0.6	0.7	0.7	0.8
22	1.3	2.0	3.3	10.6	76.3	65.0	3.1	1.8	0.5	0.7	0.7	0.8
23	1.3	1.6	2.8	9.2	96.6	65.3	2.9	1.7	0.5	0.7	0.6	0.8
24	1.3	1.6	2.4	8.1	87.0	59.4	2.8	1.6	0.5	0.7	0.6	0.8
25	1.3	1.6	2.0	7.1	78.4	55.5	2.6	1.5	0.5	0.7	0.6	0.8
26	1.3	1.6	1.7	6.2	70.7	53.0	2.5	1.3	0.4	0.7	0.5	0.8
27	1.3	1.6	1.5	5.1	63.7	46.7	2.4	1.4	0.4	0.7	0.5	0.8
28	1.3	1.6	1.3	4.2	57.4	42.5	2.2	1.3	0.4	0.7	0.5	0.8
29	1.3	1.6	1.1	25.2	51.7	38.5	2.1	1.3	0.4	0.7	0.5	0.8
30	1.3	36.2	0.9	252.9	34.7	34.7	2.0	1.2	0.4	0.7	0.5	0.8
31	1.3		0.8	91.4		30.0		1.1		0.7	0.5	

WATER YEAR=1968

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.4	25.9	15.1	2.8	272.6	102.9	30.8	16.0	4.9	3.7	5.5	6.8
2	9.2	20.9	6.8	2.5	229.5	92.7	29.0	15.4	4.6	3.4	5.5	6.5
3	7.7	16.9	27.7	2.2	215.9	83.5	26.8	14.5	4.3	3.4	5.2	5.9
4	6.2	13.6	12.9	1.8	163.9	75.2	24.9	13.9	4.0	3.1	4.9	5.9
5	4.9	11.1	269.3	1.5	124.4	68.4	23.1	13.2	4.0	3.1	4.6	5.5
6	4.0	8.9	45.0	1.2	94.6	61.6	21.3	12.6	3.7	2.8	4.3	5.2
7	4.0	7.1	65.9	0.9	71.8	64.4	20.3	12.0	3.7	2.8	4.3	4.9
8	4.0	5.9	35.4	0.9	54.5	60.7	19.4	11.4	3.4	2.5	4.0	4.6
9	4.0	4.9	19.1	0.9	49.3	54.8	18.5	10.8	3.1	2.5	3.7	4.3
10	4.0	4.9	10.2	122.0	44.4	49.6	17.6	10.2	3.1	2.5	3.7	4.3
11	4.0	4.9	8.6	75.5	39.7	45.0	16.6	9.5	2.8	2.2	3.4	4.0
12	4.0	4.9	7.4	46.8	35.7	40.7	15.7	9.2	2.8	2.2	3.4	3.7
13	4.0	4.9	6.2	45.9	32.3	220.2	14.8	8.6	2.5	2.2	3.4	3.4
14	4.0	32.0	5.2	50.2	29.0	205.4	14.2	8.3	2.5	2.2	3.4	3.4
15	4.0	25.9	4.6	601.2	26.2	188.3	13.6	8.0	2.5	2.2	3.4	3.1
16	4.0	20.9	3.7	168.3	33.3	391.3	12.9	7.4	2.2	2.2	3.4	3.1
17	4.0	16.9	3.1	111.2	333.9	174.3	12.0	7.1	2.2	2.2	3.4	3.1
18	4.0	13.9	44.4	73.3	274.7	181.1	11.7	6.8	2.2	2.2	3.4	2.8
19	4.0	11.4	24.9	48.4	225.8	148.8	11.1	6.5	1.8	2.2	3.4	2.5
20	4.0	9.2	14.2	42.5	345.3	137.4	10.5	6.2	1.8	2.2	3.4	2.5
21	4.0	7.4	12.0	37.3	364.6	126.9	9.9	5.9	1.8	2.2	3.4	2.5
22	4.0	6.2	10.2	32.6	235.0	117.0	9.5	5.5	1.5	2.2	3.4	2.5
23	4.0	4.9	8.6	28.3	297.5	118.0	8.9	5.2	1.5	2.2	3.4	2.5
24	4.0	4.9	7.4	24.9	268.0	109.0	8.6	4.9	1.5	2.2	3.4	2.5
25	4.0	4.9	6.2	21.9	241.5	103.2	8.0	4.6	1.5	2.2	3.4	2.5
26	4.0	4.9	5.2	19.1	217.8	95.5	7.7	4.6	1.5	2.2	3.4	2.5
27	4.0	4.9	4.6	24.9	196.2	88.4	7.4	4.3	1.5	2.2	3.4	2.5
28	4.0	4.9	4.0	22.2	176.8	81.6	6.8	4.0	1.5	2.2	3.4	2.5
29	4.0	4.9	3.4	77.6	159.2	75.3	6.5	4.0	1.5	2.2	3.4	2.5
30	4.0	111.5	2.8	778.9		69.9	6.2	3.7	1.2	2.2	3.4	2.5
31	4.0		2.5	281.3		64.7		3.4		2.2	3.4	

WATER YEAR-1973

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.0	19.3	34.8	174.4	214.3	49.3	10.0	10.0	6.0	6.0	6.0
2	4.0	4.0	18.2	32.5	153.4	202.8	45.1	10.0	10.0	6.0	6.0	6.0
3	4.0	4.0	16.9	30.4	151.0	226.4	42.0	10.0	10.0	5.9	6.0	6.0
4	4.0	4.0	15.8	28.3	204.3	315.3	33.0	10.0	10.0	6.0	6.0	6.0
5	4.0	4.0	14.8	26.6	193.9	187.9	30.0	10.0	10.0	6.0	6.0	6.0
6	4.0	3.9	13.8	24.9	246.3	338.8	28.0	10.0	10.0	6.0	6.0	6.0
7	4.0	7.7	13.0	23.4	1257.0	198.0	26.1	10.0	10.0	6.1	6.0	6.0
8	4.0	4.8	12.7	21.9	708.9	248.3	24.3	10.0	10.0	6.0	6.0	6.0
9	4.0	4.3	12.1	20.3	395.3	235.9	22.3	10.0	10.0	6.0	6.0	6.0
10	4.0	45.3	11.4	27.0	961.0	222.7	19.7	10.0	10.0	6.0	6.0	6.0
11	4.0	101.3	10.8	170.6	682.3	230.8	17.0	10.0	10.0	6.0	6.0	6.0
12	5.2	33.1	10.2	1823.3	392.3	217.6	14.3	10.0	10.0	6.0	6.0	6.0
13	7.4	158.0	10.0	919.0	383.3	206.7	16.0	10.0	10.0	6.0	6.0	6.0
14	11.9	390.6	10.0	466.2	1103.0	197.0	16.0	10.0	10.0	6.0	6.0	6.0
15	126.7	239.9	10.0	227.8	651.4	187.4	16.0	10.0	10.0	6.0	6.0	6.0
16	25.4	147.1	10.0	1144.1	380.1	178.0	16.0	10.0	10.0	6.0	6.0	6.0
17	108.0	85.3	96.8	600.7	217.6	170.0	16.0	10.0	6.0	6.0	6.0	6.0
18	23.1	81.9	143.3	761.3	205.8	162.0	16.0	10.0	6.0	6.0	6.0	6.0
19	15.4	71.9	191.9	1982.4	195.1	154.2	16.0	10.0	6.0	6.0	6.0	6.0
20	9.6	63.0	84.7	1069.3	184.7	149.0	16.0	10.0	6.0	6.0	6.0	6.0
21	6.1	53.0	78.9	589.8	174.4	131.6	16.0	10.0	6.0	6.0	6.0	6.0
22	5.4	48.1	92.9	359.3	164.3	146.7	16.0	10.0	6.0	6.0	6.0	6.0
23	4.8	42.0	86.7	188.1	153.3	141.8	16.0	10.0	6.0	6.0	6.0	6.0
24	4.3	36.7	81.0	112.1	233.3	137.1	16.0	10.0	6.0	6.0	6.0	6.0
25	4.0	32.1	75.6	116.7	220.6	132.3	16.0	10.0	6.0	6.0	6.0	6.0
26	4.0	28.1	70.6	132.3	235.9	124.0	16.0	10.0	6.0	6.0	6.0	6.0
27	4.0	24.7	65.9	125.1	225.3	116.6	16.0	10.0	6.0	6.0	6.0	6.0
28	4.0	21.6	61.6	118.9	390.8	109.4	16.0	10.0	6.0	6.0	6.0	6.0
29	4.0	19.0	58.9	131.4		92.3	16.0	10.0	6.0	6.0	6.0	6.0
30	4.0	16.7	55.1	201.6		94.7	16.0	10.0	6.0	6.0	6.0	6.0
31	4.0		51.5	236.0		121.0	10.0		6.0	6.0		

WATER YEAR-1973

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.3	0.9	18.5	33.8	171.4	232.5	38.3	7.2	2.1	0.3	0.1	0.9
2	0.3	0.8	17.2	31.5	161.4	220.8	36.1	6.8	2.0	0.2	0.1	0.9
3	0.2	0.7	15.9	29.4	154.0	244.4	34.0	6.5	1.9	0.2	0.1	0.9
4	0.2	0.6	14.8	27.5	202.3	333.3	32.0	6.2	1.8	0.3	0.1	0.9
5	0.1	0.7	13.8	25.6	196.9	205.9	30.0	5.9	1.7	0.3	0.1	0.9
6	0.1	0.6	12.8	23.9	269.5	356.8	28.0	5.6	1.6	0.3	0.1	0.9
7	0.1	4.3	12.0	22.4	1260.0	207.0	27.1	5.3	1.5	0.3	0.1	0.9
8	0.1	3.6	11.7	20.9	711.9	257.3	25.3	5.0	1.5	0.2	0.1	0.9
9	0.1	3.3	11.1	19.5	398.3	243.9	24.5	4.8	1.4	0.2	0.1	0.9
10	1.0	44.3	10.4	26.0	564.0	230.7	23.7	4.5	1.3	0.2	0.1	0.9
11	1.9	100.3	9.8	165.6	685.5	239.8	22.0	4.3	1.3	0.2	0.1	0.9
12	4.2	32.1	9.2	1822.3	395.3	226.6	21.3	4.1	1.2	0.2	0.1	0.9
13	6.4	157.0	8.7	918.0	386.5	214.7	20.6	3.9	1.1	0.2	0.1	0.9
14	10.9	589.6	8.2	2374.2	1106.0	204.0	19.0	3.7	1.1	0.2	0.1	0.9
15	125.7	258.9	7.7	1174.8	654.4	192.4	18.4	3.5	1.0	0.2	0.1	0.9
16	24.4	146.1	6.1	1515.1	323.1	182.0	17.8	3.3	1.0	0.2	0.1	0.9
17	107.0	84.3	55.8	2976.7	220.6	173.0	17.3	3.2	0.9	0.2	0.1	0.9
18	24.1	80.9	144.3	2007.3	208.8	164.0	15.7	3.0	0.9	0.2	0.1	0.9
19	14.4	70.9	190.9	1994.4	198.1	155.2	15.3	2.9	0.8	0.2	0.1	0.9
20	8.6	62.0	83.7	1081.3	187.7	154.0	13.8	2.7	0.8	0.2	0.1	0.9
21	5.1	54.0	77.9	601.8	177.4	171.6	12.4	2.6	0.8	0.2	0.1	0.9
22	4.4	47.1	91.9	352.3	168.3	162.7	10.9	2.5	0.7	0.2	0.1	0.9
23	3.8	41.0	85.7	184.1	158.3	153.8	9.5	2.3	0.7	0.2	0.1	0.9
24	3.3	35.7	80.0	105.1	235.5	145.1	8.2	2.2	0.6	0.2	0.1	0.9
25	2.8	31.1	74.6	113.7	223.6	137.5	6.8	2.1	0.6	0.2	0.1	0.9
26	2.4	27.1	69.6	129.3	258.9	130.0	6.5	2.0	0.6	0.2	0.1	0.9
27	2.1	23.7	64.9	122.1	328.5	122.6	6.1	1.9	0.6	0.2	0.1	0.9
28	1.8	20.6	60.6	115.9	393.8	115.4	5.8	1.8	0.5	0.2	0.1	0.9
29	1.5	18.0	57.9	121.6		109.3	5.5	1.7	0.5	0.2	0.1	0.9
30	1.3	15.7	54.1	192.6		103.7	5.3	1.6	0.5	0.2	0.1	0.9
31	1.1		50.5	233.0		127.0	5.0	1.5		0.2	0.1	

WATER YEAR-1973

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.9	2.8	37.0	104.1	186.0	233.3	71.8	22.2	6.5	0.9	0.3	2.8
2	0.9	2.5	33.0	97.0	176.8	221.1	68.1	20.9	6.2	0.9	0.3	2.8
3	0.6	2.2	49.0	90.6	169.4	244.6	64.7	20.0	5.9	0.6	0.3	2.8
4	0.6	1.8	45.6	84.7	223.3	333.6	61.6	19.1	5.5	0.9	0.3	2.8
5	0.3	2.2	42.3	78.8	212.2	206.1	58.5	18.2	5.2	0.9	0.3	2.8
6	0.3	1.8	39.4	73.6	284.9	356.7	55.4	17.2	4.9	0.9	0.3	2.8
7	0.3	13.2	37.0	69.0	1275.1	221.8	52.7	16.3	4.6	0.9	0.3	2.8
8	0.3	11.7	36.0	64.4	726.6	272.0	50.2	15.4	4.6	0.6	0.3	2.8
9	0.3	10.2	34.2	60.1	413.6	238.4	47.7	14.6	4.3	0.6	0.3	2.8
10	3.1	136.4	32.0	80.1	979.4	245.5	45.3	13.9	4.0	0.6	0.3	2.8
11	5.9	308.9	30.2	522.4	700.7	255.0	43.1	13.2	4.0	0.6	0.3	2.8
12	12.9	98.9	28.3	5612.7	410.6	242.1	41.0	12.6	3.7	0.6	0.3	2.8
13	19.7	483.6	26.8	2827.4	401.9	230.1	38.8	12.0	3.4	0.6	0.3	2.8
14	33.6	1816.0	25.3	1432.8	1121.1	218.7	37.0	11.4	3.4	0.6	0.3	2.8
15	387.2	797.4	23.7	698.5	669.6	207.6	35.1	10.8	3.1	0.6	0.3	2.8
16	75.2	450.0	24.9	3520.7	397.6	197.1	33.3	10.2	3.1	0.6	0.3	2.8
17	329.6	259.6	295.1	1847.1	235.9	187.9	31.7	9.9	2.8	0.6	0.3	2.8
18	74.2	249.2	444.4	2341.7	224.2	178.6	29.9	9.2	2.8	0.6	0.3	2.8
19	44.4	218.4	388.0	1273.3	212.8	170.0	28.6	8.9	2.5	0.6	0.3	2.8
20	26.3	191.0	257.8	681.6	202.4	169.4	27.1	8.3	2.5	0.6	0.3	2.8
21	13.7	166.3	239.9	436.7	192.2	186.6	25.9	8.0	2.5	0.6	0.3	2.8
22	13.6	145.1	283.1	235.0	182.6	177.7	24.3	7.7	2.2	0.6	0.3	2.8
23	11.7	126.3	344.0	126.6	173.4	168.8	23.1	7.1	2.2	0.6	0.3	2.8
24	10.2	110.0	246.4	120.4	251.0	160.5	22.2	6.8	1.8	0.6	0.3	2.8
25	8.6	95.8	229.8	146.9	239.0	152.5	20.9	6.5	1.8	0.6	0.3	2.8
26	7.4	83.5	214.4	139.5	273.8	144.8	20.0	6.2	1.8	0.6	0.3	2.8
27	6.3	73.0	199.9	132.7	343.4	137.4	18.8	5.9	1.8	0.6	0.3	2.8
28	5.5	63.4	186.6	126.0	409.0	130.6	17.9	5.5	1.5	0.6	0.3	2.8
29	4.6	55.4	178.3	179.9		124.1	16.9	5.2	1.5	0.6	0.3	2.8
30	4.0	48.4	166.6	285.2		119.2	16.3	4.9	1.5	0.6	0.3	2.8
31	3.4		155.5	169.4		141.7		4.6		0.6	0.3	

WATER YEAR=1974

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	282.8	90.7	214.8	316.0	1638.7	12.0	12.0	8.0	8.0	8.0
2	6.0	6.0	128.4	86.2	204.0	1043.3	1138.2	12.0	12.0	8.0	8.0	8.0
3	6.0	6.0	58.4	180.2	192.4	458.8	741.5	12.0	12.0	8.0	8.0	8.0
4	6.0	6.0	55.4	975.7	182.0	378.4	480.8	12.0	12.0	8.0	8.0	7.9
5	6.0	6.0	52.4	490.0	171.7	216.2	307.9	12.0	12.0	8.0	8.0	8.0
6	6.0	6.0	49.6	260.7	162.7	203.4	208.4	12.0	12.0	8.0	8.0	8.0
7	6.0	72.8	47.0	297.1	153.7	329.4	129.8	11.8	12.0	8.0	8.0	8.0
8	6.0	99.1	44.5	284.1	144.9	314.7	78.9	12.0	12.0	8.0	8.0	8.0
9	6.0	55.2	42.1	270.3	137.3	298.3	94.5	12.0	12.0	10.0	8.0	8.0
10	6.0	769.3	39.8	254.7	128.8	282.1	89.9	12.0	12.0	9.6	8.0	8.0
11	6.0	661.2	46.5	241.4	121.4	447.9	84.1	12.0	12.0	9.2	8.0	8.0
12	6.0	482.4	44.1	636.4	115.1	595.8	78.3	12.0	12.0	8.8	8.0	8.0
13	6.0	206.6	103.7	399.8	109.5	364.8	72.7	12.0	12.0	8.4	8.0	8.0
14	6.0	96.0	48.5	201.4	103.4	211.2	68.1	12.0	12.0	8.0	8.0	8.0
15	6.0	44.2	46.1	1067.3	97.4	200.5	63.6	12.0	12.0	8.0	8.0	8.0
16	6.0	430.5	43.9	780.0	91.6	189.9	59.2	12.0	8.0	8.0	8.0	8.0
17	6.0	197.1	50.1	900.0	85.8	179.5	54.8	12.0	8.0	8.0	8.0	8.0
18	6.0	191.4	47.7	663.3	81.1	170.3	50.5	12.0	8.0	8.0	8.0	8.0
19	6.0	83.3	45.4	696.0	79.5	160.2	47.3	12.0	8.0	8.0	8.0	8.0
20	6.0	36.8	43.1	374.7	71.0	150.3	44.1	12.0	8.0	8.0	8.0	8.0
21	6.0	80.8	174.9	199.7	66.5	141.5	41.0	12.0	8.0	8.0	8.0	8.0
22	18.9	88.2	107.9	189.3	110.7	134.9	38.0	12.0	8.0	8.0	8.0	8.0
23	34.9	51.9	52.1	179.0	104.7	128.4	35.0	12.0	8.0	8.0	8.0	8.0
24	18.1	49.1	49.8	169.9	98.7	123.1	32.0	11.8	8.0	8.0	8.0	8.0
25	15.3	46.0	47.4	160.0	92.8	120.5	29.1	11.9	8.0	8.0	8.0	8.0
26	13.0	49.1	45.1	152.2	88.3	127.9	26.3	11.8	8.0	8.0	8.0	8.0
27	11.0	46.0	146.1	143.5	83.6	144.5	23.4	11.9	8.0	8.0	8.0	8.0
28	9.4	43.2	78.6	136.0	79.9	347.1	20.7	11.8	8.0	8.0	8.0	8.0
29	8.0	40.5	94.7	128.6	44.9	17.9	17.9	11.9	8.0	8.0	8.0	8.0
30	6.9	38.0	89.7	121.3	1303.6	16.0	11.9	8.0	8.0	8.0	8.0	8.0
31	2.9		89.3	113.2	822.4		11.9		8.0	8.0		

WATER YEAR=1974

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.8	3.3	867.8	276.7	218.8	521.0	1661.7	15.1	2.1	0.3	1.3	0.5
2	0.6	2.8	392.4	262.2	207.0	1048.3	1147.2	13.6	2.0	0.3	1.3	0.5
3	0.5	2.3	162.6	552.2	195.4	661.8	750.5	12.1	1.9	0.2	1.2	0.5
4	0.4	2.0	153.4	987.7	185.0	382.4	459.8	10.7	1.8	0.2	1.2	0.4
5	0.3	1.6	144.4	502.0	174.7	219.2	316.9	9.2	1.7	0.2	1.1	0.4
6	0.3	1.4	135.6	272.7	166.7	207.4	217.4	7.8	1.6	0.2	1.0	0.4
7	0.3	71.8	127.0	311.1	158.7	334.4	138.8	7.4	1.5	0.2	1.0	0.4
8	0.3	98.1	118.5	296.1	150.9	319.7	85.9	7.1	1.4	0.2	0.9	0.4
9	0.3	34.2	110.1	281.3	143.3	303.3	103.5	6.7	1.4	0.2	0.9	0.4
10	0.3	768.3	104.8	266.7	135.8	287.1	58.9	6.4	1.3	0.2	0.8	0.4
11	0.3	660.2	140.5	253.4	128.4	452.9	93.1	6.1	1.2	0.2	0.8	0.4
12	0.3	481.4	133.1	642.4	121.1	600.8	87.3	5.8	1.2	0.2	0.8	0.4
13	0.3	205.6	316.7	411.8	114.5	369.8	82.7	5.5	1.1	0.2	0.7	0.4
14	0.3	95.0	146.5	213.4	108.4	216.2	78.1	5.2	1.1	0.2	0.7	0.4
15	0.3	43.2	139.1	1079.3	102.4	205.5	73.6	4.9	1.0	0.2	0.6	0.4
16	0.3	429.5	131.9	791.0	96.6	195.9	69.2	4.7	1.0	0.2	0.6	0.4
17	0.3	196.1	151.1	912.0	90.8	186.5	64.8	4.5	0.9	0.2	0.6	0.4
18	0.3	150.4	142.7	675.3	85.1	177.3	60.5	4.2	0.9	0.2	0.6	0.4
19	0.3	82.3	136.4	708.0	79.5	168.2	56.3	4.0	0.8	0.2	0.6	0.4
20	0.6	35.8	130.1	387.7	74.0	159.3	53.1	3.8	0.8	0.2	0.5	0.4
21	1.1	79.8	535.9	196.7	69.5	150.5	50.0	3.6	0.7	0.2	0.5	0.4
22	17.9	195.2	328.9	786.3	113.7	140.9	47.0	3.4	0.7	0.2	0.5	0.4
23	33.9	113.9	157.1	176.0	107.7	132.4	44.0	3.3	0.7	0.2	0.5	0.4
24	17.1	101.1	150.8	766.9	101.7	124.1	41.0	3.1	0.6	0.2	0.5	0.4
25	14.3	101.0	143.4	157.0	95.8	125.5	38.1	3.0	0.6	0.2	0.5	0.4
26	12.0	101.1	136.1	149.2	91.3	132.9	35.3	2.8	0.5	0.2	0.5	0.4
27	10.0	101.0	147.1	140.5	86.6	149.5	32.4	2.7	0.5	0.2	0.5	0.4
28	8.4	94.2	232.6	133.0	82.9	352.1	29.7	2.5	0.5	0.2	0.5	0.4
29	7.0	88.5	287.7	125.6		449.9	26.9	2.4	0.5	0.2	0.5	0.4
30	5.9	83.0	272.7	117.3		1307.6	25.2	2.3	0.5	0.2	0.5	0.4
31	4.9		259.3	112.2		692.4		2.2		0.2	0.5	

WATER YEAR=1974

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	10.2	847.9	276.3	233.5	535.9	1642.3	31.1	6.5	0.5	4.0	1.5
2	1.8	8.6	352.4	262.4	221.0	1063.5	1141.8	29.6	6.2	0.5	4.0	1.5
3	1.5	7.1	177.4	551.9	210.7	677.0	765.4	28.0	5.9	0.4	3.7	1.5
4	1.2	6.2	167.6	987.8	200.2	398.6	504.5	26.8	5.5	0.4	3.7	1.2
5	0.9	4.9	134.3	502.0	120.0	234.7	332.3	25.3	5.2	0.4	3.4	1.2
6	0.9	4.3	149.7	273.2	180.8	223.0	232.2	24.0	4.9	0.4	3.1	1.2
7	0.9	221.1	141.7	311.4	121.6	349.3	153.4	22.8	4.6	0.4	3.1	1.2
8	0.9	302.1	134.0	298.0	162.9	334.8	101.3	21.9	4.3	0.4	2.8	1.2
9	0.9	166.9	126.6	281.2	154.9	318.2	118.6	20.6	4.3	0.4	2.8	1.2
10	0.9	2366.4	119.5	267.0	147.2	302.1	113.7	19.7	4.0	0.4	2.5	1.2
11	0.9	2033.4	140.1	255.8	139.8	467.9	105.1	18.8	3.7	0.3	2.5	1.2
12	0.9	1682.7	132.7	642.0	132.7	615.4	130.6	17.9	3.7	0.3	2.2	1.2
13	0.9	633.2	316.3	412.1	127.6	354.4	97.6	16.7	3.4	0.3	2.2	1.2
14	0.9	292.6	146.3	213.8	121.4	231.6	97.7	15.6	3.4	0.3	2.2	1.2
15	0.9	133.1	138.9	1078.9	115.2	220.0	85.5	14.1	3.1	0.3	1.8	1.2
16	0.9	1322.9	132.1	791.6	109.6	209.1	43.8	14.5	3.1	0.3	1.8	1.2
17	0.9	604.0	151.2	911.7	104.1	198.7	79.5	13.9	2.8	0.3	1.5	1.2
18	0.9	564.4	143.8	675.4	98.9	188.8	75.5	12.9	2.8	0.3	1.5	1.2
19	0.9	253.5	134.8	708.4	93.9	179.3	71.8	12.3	2.5	0.3	1.5	1.2
20	1.8	110.3	129.7	387.2	89.3	170.3	62.1	11.7	2.5	0.3	1.5	1.2
21	3.4	245.8	535.6	211.6	54.7	361.7	64.7	11.1	2.2	0.3	1.5	1.2
22	55.1	288.6	329.3	201.1	128.4	153.7	61.6	10.5	2.2	0.3	1.2	1.2
23	104.4	156.8	157.4	191.0	122.3	146.0	58.5	10.2	2.2	0.3	1.2	1.2
24	52.7	148.1	130.3	181.4	116.1	138.9	55.4	9.5	1.8	0.3	1.2	1.2
25	44.0	132.6	142.9	172.5	110.3	140.1	52.7	9.2	1.8	0.3	1.2	1.2
26	37.0	142.1	135.8	163.9	105.6	147.5	50.2	8.6	1.8	0.3	1.2	1.2
27	30.8	138.6	144.9	155.5	100.4	164.8	47.4	8.3	1.5	0.3	0.9	1.2
28	25.9	130.0	236.0	147.8	98.3	366.8	45.3	7.7	1.5	0.3	0.9	1.2
29	21.6	121.7	288.6	140.4		464.5	42.8	7.4	1.5	0.3	0.9	1.2
30	18.2	114.0	273.2	133.4		1323.2	40.7	7.1	1.5	0.3	0.9	1.2
31	15.1		259.6	126.9		842.1		6.8		0.3	1.5	

WATER YEAR-1975

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	7.5	6.0	14.0	20.5	20.6	21.9	13.1	10.0	6.0	6.0	6.0
2	8.0	6.3	6.0	14.0	29.0	23.8	20.8	12.5	10.0	6.0	6.0	6.0
3	8.0	6.0	6.5	14.0	32.4	22.4	19.9	11.9	10.0	6.0	6.0	6.0
4	8.0	6.0	36.9	14.0	30.9	21.2	21.0	11.4	10.0	6.1	6.0	6.0
5	8.0	6.0	35.0	14.0	37.9	20.0	36.0	10.8	10.0	6.1	6.0	6.0
6	8.0	6.0	35.0	61.8	29.4	19.1	55.0	10.3	10.0	6.0	6.0	6.0
7	8.0	6.0	14.0	43.9	158.3	55.2	22.5	10.0	10.0	6.1	6.0	6.0
8	8.0	15.8	14.0	91.8	457.1	53.5	27.4	10.0	10.0	6.0	6.0	6.0
9	8.0	7.2	14.0	62.3	279.2	51.5	30.9	10.0	10.0	6.1	6.0	6.0
10	8.0	6.0	14.0	45.4	160.8	72.5	29.4	10.0	10.0	6.0	6.0	6.0
11	8.0	6.0	14.0	29.5	67.3	34.0	22.0	10.0	10.0	6.0	6.0	6.0
12	8.0	6.0	14.0	19.3	44.4	32.4	24.6	10.0	10.0	6.1	6.0	6.0
13	8.0	6.0	14.0	14.0	863.1	31.5	25.3	10.0	10.0	6.0	6.0	6.0
14	8.0	6.0	14.0	14.0	381.0	44.8	24.1	10.0	10.0	6.0	6.0	6.0
15	8.0	6.0	13.8	14.0	168.1	42.6	23.0	10.0	10.0	6.1	6.0	6.0
16	8.0	6.0	13.5	14.0	74.5	104.5	21.9	10.0	6.0	6.0	6.0	6.0
17	8.0	6.0	13.3	14.0	33.3	50.2	20.8	10.0	6.0	6.0	6.0	6.0
18	8.0	6.0	13.1	14.0	31.2	53.6	19.8	10.0	6.0	6.1	6.0	6.0
19	8.0	6.0	12.9	14.0	42.7	70.8	18.9	9.8	6.0	6.0	6.0	6.0
20	8.0	6.0	12.7	14.0	49.4	67.3	18.0	10.0	6.0	6.0	6.0	6.0
21	8.0	6.0	12.6	14.0	46.6	67.7	17.2	10.0	6.0	6.0	6.0	6.0
22	8.0	6.0	12.5	14.0	43.7	580.8	16.3	10.0	6.0	6.1	6.0	6.0
23	8.0	6.0	12.4	14.0	41.1	286.3	15.6	10.0	6.0	6.0	6.0	6.0
24	8.0	6.0	12.4	14.0	38.6	149.2	15.1	10.0	6.0	6.0	6.0	6.0
25	8.0	6.0	12.3	14.0	36.3	214.4	14.8	10.0	6.0	6.0	6.0	6.0
26	8.0	6.0	14.0	13.9	34.1	167.9	18.9	10.0	6.0	6.0	6.0	6.0
27	8.0	6.0	91.6	13.7	32.0	54.5	18.0	10.0	6.0	6.1	6.0	6.0
28	26.1	6.0	52.9	13.5	30.1	51.9	17.1	10.0	6.0	6.0	6.0	6.0
29	21.3	6.0	30.8	13.5	49.3	16.3	16.3	10.0	6.0	6.0	6.0	6.0
30	17.4	6.0	18.1	13.3	46.9	15.6	15.6	10.0	6.0	6.0	6.0	6.0
31	14.3	6.0	14.0	13.2	44.6	10.0	10.0	6.0	6.0	6.0	6.0	6.0

WATER YEAR-1975

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.6	6.5	0.2	8.4	19.5	28.6	47.9	19.1	4.4	1.3	0.1	0.3
2	0.4	5.3	1.2	7.1	28.0	35.8	44.8	17.5	4.2	1.3	0.1	0.3
3	0.4	4.3	5.5	6.1	31.4	32.4	41.9	14.9	4.0	1.2	0.1	0.3
4	0.4	3.3	37.9	5.2	49.9	29.2	47.0	12.4	3.8	1.2	0.1	0.3
5	0.4	2.8	18.7	4.5	36.9	27.0	93.0	10.8	3.6	1.1	0.1	0.3
6	0.4	2.3	9.3	60.6	28.4	25.1	151.0	9.3	3.4	1.0	0.1	0.3
7	0.4	1.9	7.7	42.9	157.3	103.2	69.5	8.9	3.2	1.0	0.1	0.3
8	0.4	14.8	6.5	90.8	456.1	102.5	66.4	8.4	3.1	0.9	0.1	0.3
9	0.4	6.2	3.4	61.3	278.2	98.5	75.9	8.0	2.9	0.9	0.1	0.3
10	0.4	5.0	4.3	44.4	159.8	145.5	72.4	7.6	2.9	0.9	0.1	0.3
11	0.4	4.1	3.8	28.5	66.3	59.0	69.0	7.2	2.6	0.8	0.1	0.3
12	0.4	3.4	3.1	18.3	43.4	55.4	65.6	6.9	2.5	0.8	0.1	0.3
13	0.4	2.7	2.6	11.7	664.1	54.5	62.3	6.5	2.4	0.7	0.1	0.3
14	0.4	2.2	2.2	10.2	380.0	64.8	59.1	6.2	2.3	0.7	0.1	0.3
15	0.4	1.8	1.8	8.9	374.1	80.6	56.0	5.9	2.1	0.7	0.1	0.3
16	0.4	1.5	1.5	7.7	164.5	140.5	52.9	5.6	2.0	0.6	0.1	0.3
17	0.4	1.2	1.3	6.7	72.3	162.2	49.8	5.3	1.9	0.6	0.1	0.3
18	0.4	1.0	1.1	5.9	67.2	98.6	46.8	5.0	1.8	0.6	0.1	0.3
19	0.4	0.8	0.9	5.1	93.7	118.8	43.9	4.8	1.7	0.5	0.1	0.3
20	0.4	0.7	0.7	4.5	108.6	138.3	40.0	4.6	1.7	0.5	0.1	0.3
21	0.4	1.3	0.6	3.9	102.6	131.7	36.2	4.3	1.6	0.5	0.1	0.3
22	0.4	1.0	0.5	3.4	96.7	1283.8	33.3	4.1	1.5	0.5	0.1	0.3
23	0.4	0.8	0.4	2.9	91.1	624.3	30.6	3.9	1.4	0.4	0.1	0.3
24	0.4	0.7	0.4	2.6	85.6	441.2	28.1	3.7	1.4	0.4	0.1	0.3
25	0.4	0.6	0.3	2.2	80.3	652.4	26.1	3.5	1.3	0.4	0.1	0.3
26	0.4	0.5	2.0	1.9	73.1	313.9	23.9	3.2	1.2	0.4	0.1	0.3
27	0.4	0.4	90.6	1.7	70.0	149.5	26.0	3.2	1.2	0.4	0.1	0.3
28	25.1	0.3	51.9	1.5	65.1	141.9	23.1	3.0	1.1	0.3	0.1	0.3
29	20.3	0.3	29.8	1.3	134.3	130.3	20.3	2.9	1.0	0.3	0.1	0.3
30	16.4	0.2	17.1	1.3	126.9	26.6	2.7	2.7	1.0	0.3	0.1	0.3
31	13.3	9.8	1.2	1.2	119.6	2.6	2.6	0.3	0.3	0.1	0.3	0.3

WATER YEAR-1975

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	20.0	0.6	25.9	60.1	60.4	64.4	37.3	13.6	4.0	0.3	0.9
2	1.2	16.3	3.7	21.9	86.2	70.2	61.0	35.4	12.9	4.0	0.3	0.9
3	1.2	13.2	16.9	18.8	96.7	65.9	58.2	33.6	12.3	3.7	0.3	0.9
4	1.2	10.8	116.7	16.0	153.7	62.2	61.6	32.0	11.7	3.7	0.3	0.9
5	1.2	8.6	97.6	12.9	113.7	58.5	107.8	30.2	11.1	3.4	0.3	0.9
6	1.2	7.1	28.6	186.6	87.5	55.7	166.3	28.6	10.5	3.1	0.3	0.9
7	1.2	5.9	23.7	132.1	484.5	166.9	84.7	27.4	9.9	3.1	0.3	0.9
8	1.2	45.6	20.0	279.7	1404.8	161.7	81.3	25.9	9.5	2.8	0.3	0.9
9	1.2	19.1	16.6	188.8	856.9	155.5	92.1	24.6	8.9	2.8	0.3	0.9
10	1.2	15.4	13.9	136.8	492.2	320.2	97.5	23.4	8.6	2.5	0.3	0.9
11	1.2	12.6	11.7	87.8	206.2	161.4	83.2	22.2	8.0	2.5	0.3	0.9
12	1.2	10.5	9.3	56.4	123.3	98.7	78.4	21.3	7.7	2.5	0.3	0.9
13	1.2	8.3	8.0	36.0	253.4	110.0	61.8	20.0	7.4	2.2	0.3	0.9
14	1.2	6.8	6.8	31.4	117.4	104.9	72.1	18.1	7.1	2.2	0.3	0.9
15	1.2	5.5	5.5	27.4	514.2	128.1	67.8	16.2	6.5	2.2	0.3	0.9
16	1.2	4.6	4.6	23.7	226.4	318.8	64.4	17.2	6.2	1.8	0.3	0.9
17	1.2	3.7	4.0	20.6	99.3	151.5	61.0	16.3	5.9	1.8	0.3	0.9
18	1.2	3.1	3.4	18.2	93.0	162.0	57.9	15.4	5.5	1.8	0.3	0.9
19	1.2	2.5	2.8	15.7	128.4	215.0	55.1	14.8	5.2	1.5	0.3	0.9
20	1.2	2.2	2.2	13.9	149.7	204.2	52.4	14.2	5.2	1.5	0.3	0.9
21	1.2	4.0	1.8	12.0	140.4	205.4	49.9	13.2	4.9	1.5	0.3	0.9
22	1.2	3.1	1.5	10.5	131.5	1785.8	47.1	12.6	4.6	1.5	0.3	0.9
23	1.2	2.5	1.2	8.9	123.5	878.7	45.0	12.0	4.3	1.2	0.3	0.9
24	1.2	2.2	1.2	8.0	113.8	456.5	43.4	11.4	4.3	1.2	0.3	0.9
25	1.2	1.8	0.9	6.8	108.7	657.3	37.9	10.8	4.0	1.2	0.3	0.9
26	1.2	1.5	6.2	5.9	101.9	329.3	35.1	10.2	3.7	1.2	0.3	0.9
27	1.2	1.2	279.0	5.2	95.5	164.8	32.4	9.9	3.7	1.2	0.3	0.9
28	77.3	0.9	159.9	4.6	89.6	156.8	49.6	9.2	3.4	0.9	0.3	0.9
29	62.5	0.9	91.8	4.6	148.8	47.1	8.9	8.9	3.1	0.9	0.3	0.9
30	50.5	0.6	52.7	4.0	141.4	45.0	8.3	8.3	3.1	0.9	0.3	0.9
31	41.0	30.2	3.7	134.3	134.3	8.0	8.0	0.9	0.9	0.3	0.3	0.9

WATER YEAR=1976

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	18.3	8.4	14.0	8.2	38.8	6.0	6.0	4.0	4.0	4.0	4.0
2	6.0	13.3	2.3	14.0	8.2	95.3	6.0	6.0	4.0	4.0	4.0	4.0
3	6.0	13.1	6.4	14.0	8.2	38.9	6.0	6.0	4.0	4.0	4.0	4.0
4	6.0	11.2	6.0	14.0	8.2	28.8	6.0	6.0	4.0	4.0	4.0	4.0
5	6.0	9.5	6.0	14.0	8.2	21.3	6.0	6.0	4.0	4.0	4.0	4.0
6	6.0	8.2	6.0	14.0	8.2	13.9	6.0	6.0	4.0	4.0	4.0	4.0
7	6.0	7.0	6.0	14.0	8.2	11.9	6.0	6.0	4.0	4.0	4.0	4.0
8	6.0	6.0	6.0	14.0	8.2	10.7	6.0	6.0	4.0	4.0	4.0	4.0
9	6.0	6.0	6.0	14.0	8.2	10.0	6.0	6.0	4.0	4.0	4.0	4.0
10	76.0	4.2	6.0	14.0	8.2	10.0	6.0	6.0	4.0	4.0	4.0	4.0
11	34.1	6.0	6.0	14.0	8.2	10.0	6.0	6.0	4.0	4.0	4.0	4.0
12	15.7	6.0	6.0	14.0	8.2	10.0	6.0	6.0	4.0	4.0	4.0	4.0
13	7.5	6.0	6.0	14.0	8.2	10.0	6.0	6.0	4.0	4.0	4.0	4.0
14	6.4	6.0	6.0	14.0	10.0	10.0	6.0	6.0	4.0	4.0	4.0	4.0
15	6.0	6.0	6.0	14.0	10.0	10.5	6.0	6.0	4.0	4.0	4.0	4.0
16	6.0	16.7	35.0	13.9	10.0	10.0	6.0	6.0	4.0	4.0	4.0	4.0
17	6.0	14.3	35.0	13.8	10.0	10.0	6.0	6.0	4.0	4.0	4.0	4.0
18	6.0	12.3	35.0	13.4	10.0	10.0	6.0	6.0	4.0	4.0	4.0	4.0
19	6.0	10.4	13.1	12.2	16.3	10.0	6.0	6.0	4.0	4.0	4.0	4.0
20	6.0	9.1	13.1	13.0	14.3	10.0	6.0	6.0	4.0	4.0	4.0	4.0
21	6.0	7.9	13.1	12.9	12.6	10.0	6.0	6.0	4.0	4.0	4.0	4.0
22	6.0	6.9	23.5	12.8	11.1	10.0	6.0	6.0	4.0	4.0	4.0	4.0
23	6.0	6.0	20.3	12.7	10.0	10.0	6.0	6.0	4.0	4.0	4.0	4.0
24	6.0	6.0	17.6	12.6	10.0	9.9	6.0	6.0	4.0	4.0	4.0	4.0
25	6.0	6.0	13.2	12.5	10.0	9.7	6.0	6.0	4.0	4.0	4.0	4.0
26	6.0	6.0	14.0	12.4	10.0	9.5	6.0	6.0	4.0	4.0	4.0	4.0
27	6.0	6.0	14.0	12.4	10.0	9.7	6.0	6.0	4.0	4.0	4.0	4.0
28	6.0	6.0	14.0	12.3	10.0	9.4	6.0	6.0	4.0	4.0	4.0	4.0
29	6.0	6.0	14.0	12.3	130.5	9.4	6.0	6.0	4.0	4.0	4.0	4.0
30	28.4	6.0	14.0	12.3		9.2	6.0	6.0	4.0	4.0	4.0	4.0
31	15.0		14.0	12.3		9.1	6.0	6.0	4.0	4.0	4.0	4.0

WATER YEAR=1976

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.2	17.3	7.4	7.4	0.3	57.8	0.0	0.7	0.2	0.7	0.1	1.9
2	0.2	14.5	6.3	6.3	0.3	94.3	0.0	0.7	0.2	0.7	0.1	1.8
3	0.2	12.3	5.4	5.4	0.2	37.9	0.0	0.7	0.2	0.7	0.1	1.6
4	0.2	10.2	4.5	4.7	0.2	27.8	0.0	0.7	0.2	0.7	0.1	1.5
5	0.2	8.5	3.9	4.0	0.2	20.3	0.0	0.7	0.2	0.7	0.1	1.4
6	0.2	7.2	3.3	3.4	0.3	14.9	0.0	0.7	0.1	0.7	0.1	1.2
7	0.2	6.0	2.8	3.0	0.2	10.9	0.0	0.7	0.1	0.7	0.1	1.2
8	0.2	5.0	2.4	2.5	0.2	9.7	1.1	0.7	0.1	0.7	0.1	1.0
9	0.2	4.4	2.0	3.2	0.2	8.7	0.9	0.7	0.1	0.7	0.1	1.0
10	75.0	5.2	1.7	4.6	0.2	7.5	1.0	0.7	0.1	0.7	0.1	1.0
11	35.1	4.4	1.5	4.0	0.2	6.9	0.8	0.7	0.1	0.7	0.1	1.0
12	14.7	3.7	1.3	3.4	0.2	6.2	0.7	0.7	0.1	0.7	0.1	1.0
13	6.5	3.1	1.1	3.0	0.2	5.5	0.4	0.7	0.1	0.7	0.0	1.0
14	5.4	2.6	1.1	2.5	2.1	4.9	0.5	0.7	0.1	0.7	0.0	1.0
15	4.4	2.2	1.1	2.2	3.1	4.9	0.4	0.7	0.1	0.7	1.4	1.0
16	3.6	1.9	1.1	1.9	5.5	3.9	0.3	0.7	0.1	0.7	1.2	1.0
17	3.0	1.3	1.1	1.6	5.4	3.3	0.3	0.7	0.1	0.7	1.1	1.0
18	2.5	1.1	1.1	1.4	4.8	3.1	0.2	0.7	0.1	0.7	1.0	1.0
19	2.0	0.6	1.1	1.2	15.3	2.8	0.2	0.7	0.1	0.7	1.0	1.0
20	1.7	0.1	1.1	1.0	13.3	2.5	0.2	0.7	0.1	0.7	0.9	1.0
21	1.4	0.9	1.1	0.9	11.6	2.7	0.2	0.7	0.1	0.7	0.8	1.0
22	1.1	5.9	22.5	0.8	10.1	2.4	0.1	0.7	0.1	0.7	0.8	1.0
23	0.9	5.0	19.3	0.7	8.8	2.2	0.1	0.7	0.1	0.7	0.8	1.0
24	0.8	4.2	16.6	0.6	7.7	1.9	0.1	0.7	0.1	0.7	0.7	1.0
25	0.6	3.6	14.2	0.5	6.7	1.7	0.1	0.7	0.1	0.7	0.7	1.0
26	0.5	3.0	12.2	0.4	6.2	1.5	0.1	0.7	0.1	0.7	0.6	1.0
27	0.4	2.6	10.5	0.4	5.4	1.3	0.1	0.7	0.1	0.7	0.6	1.0
28	0.4	2.2	9.0	0.3	4.8	1.5	0.1	0.7	0.1	0.7	0.5	1.0
29	0.3	1.9	7.7	0.3	129.5	1.4	0.1	0.7	0.1	0.7	0.5	1.0
30	27.4	1.6	6.6	0.3		1.2	0.1	0.7	0.1	0.7	0.5	1.0
31	14.0		5.7	0.3		1.1	0.7	0.7	0.7	0.7	0.4	

WATER YEAR=1976

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.6	53.3	22.8	22.8	0.9	178.0	0.0	2.2	0.6	2.2	0.3	5.9
2	0.6	44.7	19.4	19.4	0.9	290.4	0.0	2.2	0.6	2.2	0.3	5.5
3	0.6	37.3	16.6	16.6	0.6	116.7	0.0	2.2	0.6	2.2	0.3	4.9
4	0.6	31.4	13.9	14.5	0.6	85.6	0.0	2.2	0.6	2.2	0.3	4.3
5	0.6	26.2	12.0	12.3	0.6	62.5	0.0	2.2	0.6	2.2	0.3	4.0
6	0.6	22.2	10.2	10.5	0.9	45.9	0.0	2.2	0.6	2.2	0.3	3.7
7	0.6	18.5	8.6	9.2	0.6	33.6	0.0	2.2	0.5	2.2	0.3	3.4
8	0.6	15.4	7.4	7.7	0.8	29.9	3.4	2.2	0.5	2.2	0.3	3.1
9	0.6	12.9	6.2	6.6	0.6	26.8	2.8	2.2	0.3	2.2	0.3	3.1
10	231.0	16.0	5.2	14.2	0.6	24.0	3.1	2.2	0.3	2.2	0.3	3.1
11	101.9	13.6	4.2	12.3	0.6	21.3	2.5	2.2	0.3	2.2	0.3	3.1
12	41.3	11.4	4.0	10.5	0.6	19.1	2.2	2.2	0.3	2.2	0.3	3.1
13	10.0	9.5	3.4	9.2	0.4	16.9	1.8	2.2	0.3	2.2	0.0	3.1
14	10.6	8.8	3.2	7.7	6.5	15.1	1.5	2.2	0.3	2.2	0.0	3.1
15	13.6	8.8	3.2	6.8	9.5	15.1	1.2	2.2	0.3	2.2	4.3	3.1
16	11.1	6.4	3.4	5.9	16.9	12.0	0.9	2.2	0.3	2.2	3.7	3.1
17	9.2	4.0	3.4	4.9	16.6	10.8	0.9	2.2	0.3	2.2	3.4	3.1
18	7.7	34.8	3.4	4.3	14.8	9.5	0.6	2.2	0.3	2.2	3.1	3.1
19	6.2	29.6	3.4	3.7	47.1	8.6	0.6	2.2	0.3	2.2	3.1	3.1
20	5.2	24.9	3.4	3.1	41.0	7.7	0.6	2.2	0.3	2.2	2.8	3.1
21	4.3	21.3	3.4	2.8	35.7	6.3	0.6	2.2	0.3	2.2	2.5	3.1
22	3.4	18.2	49.3	2.5	31.1	7.4	0.3	2.2	0.3	2.2	2.5	3.1
23	2.8	15.4	59.4	2.2	27.1	6.8	0.3	2.2	0.3	2.2	2.5	3.1
24	2.5	12.9	51.1	1.8	23.7	5.9	0.3	2.2	0.3	2.2	2.2	3.1
25	1.8	11.1	43.7	1.5	20.6	5.2	0.3	2.2	0.3	2.2	2.2	3.1
26	1.5	9.2	37.6	1.2	19.1	4.6	0.3	2.2	0.3	2.2	1.8	3.1
27	1.2	8.0	32.3	1.2	16.6	4.9	0.3	2.2	0.3	2.2	1.5	3.1
28	1.2	6.8	27.7	0.9	14.8	4.3	0.3	2.2	0.3	2.2	1.3	3.1
29	0.9	5.9	23.7	0.9	398.9	3.7	0.3	2.2	0.3	2.2	1.3	3.1
30	85.0	4.9	20.3	0.9		3.2	0.3	2.2	0.3	2.2	1.2	
31	43.1		17.4	0.9		3.4	2.2	2.2	2.2	2.2	1.2	

WATER YEAR=1977

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.0	4.6	5.5	1.2	1.1	2.2	3.3	1.3	1.1	1.1	1.1
2	4.0	4.0	4.0	94.4	1.2	1.0	2.2	3.0	1.3	1.1	1.1	1.1
3	4.0	4.0	4.0	114.9	1.2	1.0	2.2	2.8	1.3	1.1	1.1	1.1
4	4.0	4.0	4.0	24.9	1.2	1.0	2.2	2.6	1.3	1.1	1.1	1.1
5	4.0	4.0	4.0	14.8	1.2	1.0	2.2	2.5	1.2	1.1	1.1	1.1
6	4.0	4.0	4.0	9.0	1.2	1.0	2.2	2.3	1.2	1.1	1.1	1.1
7	4.0	4.0	4.0	7.8	1.2	1.0	2.2	2.2	1.2	1.1	1.1	1.1
8	4.0	4.0	4.0	6.8	1.2	1.0	2.2	2.1	1.2	1.1	1.1	1.1
9	4.0	4.0	4.0	6.0	1.2	1.0	2.2	1.9	1.2	1.1	1.1	1.1
10	4.0	4.0	4.0	5.3	1.2	1.0	2.2	1.9	1.2	1.1	1.1	1.1
11	4.0	4.0	4.0	4.6	1.2	1.0	2.2	1.8	1.2	1.1	1.1	1.1
12	4.0	4.0	4.0	4.1	1.2	1.0	2.2	1.7	1.2	1.1	1.1	1.1
13	4.0	4.0	4.0	3.7	1.2	1.0	2.2	1.6	1.2	1.1	1.1	1.1
14	4.0	14.6	4.0	3.3	1.2	1.0	2.2	1.6	1.2	1.1	1.1	1.1
15	4.0	12.2	4.0	3.0	1.2	1.0	2.2	1.5	1.2	1.1	1.1	1.1
16	4.0	10.2	4.0	2.7	1.2	1.4	2.2	1.4	1.2	1.1	1.1	1.1
17	4.0	8.6	4.0	2.4	1.2	1.3	2.2	1.4	1.2	1.1	1.1	1.9
18	4.0	7.2	4.0	2.2	1.2	1.2	2.2	1.4	1.2	1.1	1.1	1.8
19	4.0	6.1	4.0	2.1	1.2	1.1	2.2	1.4	1.2	1.1	1.1	9.1
20	4.0	5.2	4.0	1.9	1.2	1.1	2.2	1.4	1.2	1.1	1.1	8.4
21	4.0	4.5	4.0	1.8	1.2	1.1	2.2	1.4	1.2	1.1	1.1	7.8
22	4.0	4.0	4.0	1.7	1.2	1.1	2.2	1.4	1.2	1.1	1.1	7.2
23	4.0	4.0	4.0	1.6	1.2	1.1	2.2	1.4	1.2	1.1	1.1	6.7
24	4.0	4.0	4.0	1.5	1.2	1.1	2.2	1.4	1.2	1.1	1.1	6.2
25	4.0	4.0	4.0	1.4	1.2	1.1	2.2	1.4	1.2	1.1	1.1	5.8
26	4.0	4.0	4.0	1.4	1.2	1.1	2.2	1.4	1.2	1.1	1.1	5.4
27	4.0	4.0	4.0	1.3	1.2	1.1	2.2	1.4	1.2	1.1	1.1	5.0
28	4.0	4.0	4.0	1.3	1.2	1.1	2.2	1.4	1.2	1.1	1.1	4.7
29	4.0	4.0	4.0	1.2	1.2	1.1	2.2	1.4	1.2	1.1	1.1	50.8
30	4.0	4.0	4.0	1.2	1.2	1.1	2.2	1.4	1.2	1.1	1.1	43.8
31	4.0	4.0	7.6	1.2	1.2	1.1	2.2	1.4	1.2	1.1	1.1	

WATER YEAR=1977

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.6	0.3	3.6	4.5	0.2	0.1	1.2	2.3	0.3	0.1	0.1	0.1
2	1.4	0.3	2.9	93.4	0.2	0.0	1.2	2.0	0.3	0.1	0.1	0.1
3	1.3	0.3	2.4	113.9	0.2	0.0	1.2	1.8	0.3	0.1	0.1	0.1
4	1.1	0.3	2.0	23.9	0.2	0.0	1.2	1.6	0.3	0.1	0.1	0.1
5	0.9	0.3	1.6	13.8	0.2	0.0	1.2	1.5	0.2	0.1	0.1	0.1
6	0.7	0.3	1.5	8.0	0.2	0.0	1.2	1.3	0.2	0.1	0.1	0.1
7	0.6	0.3	1.5	6.9	0.2	0.0	1.2	1.2	0.2	0.1	0.1	0.1
8	0.5	0.3	1.5	5.8	0.2	0.0	1.2	1.1	0.2	0.1	0.1	0.1
9	0.4	0.3	1.5	5.0	0.2	0.0	1.2	0.9	0.2	0.1	0.1	0.1
10	0.3	0.3	1.5	4.3	0.2	0.0	1.2	0.9	0.2	0.1	0.1	0.1
11	0.2	0.3	1.5	3.6	0.2	0.0	1.2	0.8	0.2	0.1	0.1	0.1
12	0.2	0.3	1.5	3.1	0.2	0.0	1.2	0.7	0.2	0.1	0.1	0.1
13	0.2	0.3	1.5	2.7	0.2	0.0	1.2	0.6	0.2	0.1	0.1	0.1
14	0.2	13.6	1.5	2.3	0.2	0.0	1.2	0.6	0.2	0.1	0.1	0.1
15	0.2	11.2	1.5	2.0	0.2	0.0	1.2	0.5	0.2	0.1	0.1	0.1
16	0.2	9.2	1.5	1.7	0.2	0.4	1.2	0.4	0.2	0.1	0.1	0.1
17	0.2	7.6	1.5	1.4	0.2	0.3	1.2	0.4	0.2	0.1	0.1	0.9
18	0.2	6.2	1.5	1.2	0.2	0.2	1.2	0.4	0.2	0.1	0.1	0.8
19	0.2	5.1	1.5	1.1	0.2	0.1	1.2	0.4	0.2	0.1	0.1	8.1
20	0.2	4.2	1.5	0.9	0.2	0.1	1.2	0.4	0.2	0.1	0.1	7.4
21	0.2	3.5	1.5	0.8	13.4	0.1	1.2	0.4	0.2	0.1	0.1	6.3
22	0.2	2.8	1.5	0.7	11.5	0.1	1.2	0.4	0.2	0.1	0.1	6.2
23	0.2	2.3	1.5	0.6	14.6	0.1	1.2	0.4	0.2	0.1	0.1	5.7
24	0.2	1.9	1.5	0.5	12.6	0.1	1.2	0.4	0.2	0.1	0.1	5.2
25	0.2	1.4	1.5	0.4	11.0	0.1	1.2	0.4	0.2	0.1	0.1	4.8
26	0.2	1.2	1.5	0.4	9.5	0.1	1.2	0.4	0.2	0.1	0.1	4.4
27	0.2	1.1	1.5	0.3	8.1	0.1	1.2	0.4	0.2	0.1	0.1	4.0
28	0.2	0.9	1.5	0.3	7.2	0.1	1.2	0.4	0.2	0.1	0.1	3.7
29	0.2	0.7	1.5	0.2		0.1	1.2	0.4	0.2	0.1	0.1	49.8
30	0.2	0.6	1.5	0.2		0.1	1.2	0.4	0.2	0.1	0.1	42.8
31	0.2		6.6	0.2		0.1		0.4		0.1	0.1	

WATER YEAR=1977

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	0.9	11.1	13.9	0.6	0.3	3.7	7.1	0.9	0.3	0.3	0.3
2	4.9	0.9	8.9	287.7	0.6	0.0	3.7	6.2	0.9	0.3	0.3	0.3
3	4.0	0.9	7.4	350.8	0.6	0.0	3.7	5.3	0.9	0.3	0.3	0.3
4	3.4	0.9	6.2	73.6	0.6	0.0	3.7	4.9	0.9	0.3	0.3	0.3
5	2.8	0.9	4.9	42.5	0.6	0.0	3.7	4.6	0.6	0.3	0.3	0.3
6	2.2	0.9	4.6	24.6	0.6	0.0	3.7	4.0	0.6	0.3	0.3	0.3
7	1.8	0.9	4.6	20.9	0.6	0.0	3.7	3.7	0.6	0.3	0.3	0.3
8	1.5	0.9	4.6	17.9	0.6	0.0	3.7	3.4	0.6	0.3	0.3	0.3
9	1.2	0.9	4.6	15.4	0.6	0.0	3.7	2.8	0.6	0.3	0.3	0.3
10	0.9	0.9	4.6	13.2	0.6	0.0	3.7	2.6	0.6	0.3	0.3	0.3
11	0.6	0.9	4.6	11.1	0.6	0.0	3.7	2.3	0.6	0.3	0.3	0.3
12	0.6	0.9	4.6	9.6	0.6	0.0	3.7	2.2	0.6	0.3	0.3	0.3
13	0.6	0.9	4.6	8.3	0.6	0.0	3.7	1.8	0.6	0.3	0.3	0.3
14	0.6	41.9	4.6	7.1	0.6	0.0	3.7	1.8	0.6	0.3	0.3	0.3
15	0.6	34.5	4.6	6.2	0.6	0.0	3.7	1.6	0.6	0.3	0.3	0.3
16	0.6	28.3	4.6	5.2	0.6	0.0	3.7	1.2	0.6	0.3	0.3	0.3
17	0.6	23.4	4.6	4.3	0.6	0.0	3.7	1.2	0.6	0.3	0.3	2.8
18	0.6	19.1	4.6	3.7	0.6	0.0	3.7	1.2	0.6	0.3	0.3	2.5
19	0.6	15.7	4.6	3.4	0.6	0.0	3.7	1.2	0.6	0.3	0.3	26.9
20	0.6	12.9	4.6	2.8	0.6	0.0	3.7	1.2	0.6	0.3	0.3	22.8
21	0.6	10.8	4.6	2.5	36.7	0.3	3.7	1.2	0.6	0.3	0.3	20.9
22	0.6	8.6	4.6	2.2	35.4	0.3	3.7	1.2	0.6	0.3	0.3	19.1
23	0.6	7.1	4.6	1.8	45.0	0.3	3.7	1.2	0.6	0.3	0.3	17.6
24	0.6	5.9	4.6	1.5	38.8	0.3	3.7	1.2	0.6	0.3	0.3	16.0
25	0.6	4.9	4.6	1.2	33.9	0.3	3.7	1.2	0.6	0.3	0.3	14.8
26	0.6	4.0	4.6	1.2	29.3	0.3	3.7	1.2	0.6	0.3	0.3	13.6
27	0.6	3.4	4.6	0.9	25.6	0.3	3.7	1.2	0.6	0.3	0.3	12.3
28	0.6	2.8	4.6	0.9	22.2	0.3	3.7	1.2	0.6	0.3	0.3	11.4
29	0.6	2.2	4.6	0.6		0.3	3.7	1.2	0.6	0.3	0.3	153.4
30	0.6	1.8	4.6	0.6		0.3	3.7	1.2	0.6	0.3	0.3	131.4
31	0.6		20.3	0.6		0.3		1.2		0.3	0.3	

WATER YEAR=1964

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	8.0	22.9	14.0	29.4	10.8	6.0	6.0	4.0	4.0	4.0	4.0
2	8.0	8.0	20.1	14.0	20.9	10.8	6.0	6.0	4.0	4.0	4.0	4.0
3	8.0	8.0	17.6	14.0	18.7	10.7	6.0	6.0	4.0	4.0	4.0	4.0
4	8.0	19.7	15.4	14.0	16.6	10.6	6.0	6.0	4.0	4.0	4.0	4.0
5	8.0	9.8	14.0	14.0	14.9	10.6	6.0	6.0	4.0	4.0	4.0	4.0
6	8.0	159.5	14.0	14.0	13.3	10.5	6.0	6.0	4.0	4.0	4.0	4.0
7	8.0	35.0	14.0	14.0	12.0	10.5	6.0	6.0	4.0	4.0	4.0	4.0
8	8.0	35.0	14.0	14.0	12.0	10.4	6.0	6.0	4.0	4.0	4.0	4.0
9	8.0	14.0	14.0	14.0	12.0	10.4	6.0	6.0	4.0	4.0	4.0	4.0
10	8.0	14.0	14.0	14.0	12.0	10.3	6.0	6.0	5.5	4.0	4.0	4.0
11	8.0	14.0	14.0	14.0	12.0	10.3	6.0	6.0	5.2	4.0	4.0	4.0
12	8.0	14.0	14.0	14.0	12.0	15.8	6.0	6.0	4.8	4.0	4.0	4.0
13	8.0	14.0	14.0	14.0	12.0	15.5	6.0	6.0	4.5	4.0	4.0	4.0
14	8.0	69.8	14.0	14.0	12.0	14.0	6.0	6.0	4.2	4.0	4.0	4.0
15	8.1	91.6	14.0	14.0	12.0	12.7	6.0	6.0	4.0	4.0	4.0	4.0
16	8.0	35.0	14.0	14.0	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
17	8.0	14.6	14.0	14.0	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
18	8.0	14.0	14.0	72.3	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
19	8.0	14.0	13.8	196.4	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
20	8.0	67.0	14.0	138.2	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
21	8.0	40.7	14.0	97.3	12.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
22	8.0	24.9	13.9	86.3	11.8	24.6	6.0	6.0	4.0	4.0	4.0	4.0
23	8.0	165.4	13.7	78.6	11.6	19.4	6.0	6.0	4.0	4.0	4.0	4.0
24	8.0	33.9	13.5	67.9	11.4	35.1	6.0	6.0	4.0	4.0	4.0	4.0
25	8.0	21.9	14.0	60.3	11.2	13.7	6.0	6.0	4.0	4.0	4.0	4.0
26	8.0	14.3	14.0	33.5	11.1	12.5	6.0	6.0	4.0	4.0	4.0	4.0
27	8.0	14.0	14.0	47.5	11.0	12.0	6.0	6.0	4.0	4.0	4.0	4.0
28	8.0	14.0	14.0	42.2	10.9	12.0	6.0	6.0	4.0	4.0	4.0	4.0
29	8.0	14.0	14.0	37.5	10.8	12.0	6.0	6.0	4.0	4.0	4.0	4.0
30	8.0	14.0	14.0	33.3	12.0	6.0	6.0	6.0	4.0	4.0	4.0	4.0
31	8.0	13.9	29.6	12.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0

WATER YEAR=1964

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.4	0.2	21.9	12.0	28.4	0.8	3.9	2.1	1.2	0.2	0.1	0.4
2	0.3	0.2	19.1	11.0	19.9	0.8	3.5	2.1	1.1	0.2	0.1	0.4
3	0.2	0.2	16.6	9.6	17.7	0.7	3.2	2.1	1.0	0.2	0.1	0.4
4	0.2	18.7	14.4	8.4	15.6	0.6	2.9	2.1	0.9	0.2	0.1	0.4
5	0.1	8.8	12.5	7.3	13.9	0.6	2.6	2.1	0.8	0.2	0.1	0.4
6	0.1	158.5	10.9	6.4	12.3	0.5	2.4	2.1	0.7	0.2	0.1	0.4
7	0.1	25.5	9.5	10.6	10.9	0.5	2.1	2.1	0.7	0.1	0.1	0.4
8	0.1	13.0	8.2	5.3	9.6	0.4	1.9	2.1	0.6	0.1	0.1	0.4
9	0.1	11.0	7.1	8.1	8.5	0.4	1.8	2.1	0.6	0.1	0.1	0.4
10	0.1	9.2	6.2	7.8	7.6	0.3	1.6	2.1	0.5	0.1	0.1	0.4
11	2.8	7.8	5.4	6.8	6.7	0.3	1.4	2.1	0.4	0.1	0.1	0.4
12	2.2	6.6	4.7	6.0	5.9	0.3	1.3	2.1	0.3	0.1	0.1	0.4
13	1.8	5.5	4.1	5.3	5.2	0.3	1.2	2.1	0.3	0.1	0.1	0.4
14	1.5	6.8	3.5	7.1	4.6	0.3	1.1	2.1	0.3	0.1	0.1	0.4
15	7.1	90.6	3.1	6.2	4.3	0.2	1.0	2.1	0.2	0.1	0.1	0.4
16	2.9	18.8	2.7	5.4	3.7	0.2	0.9	2.1	0.2	0.1	0.1	0.4
17	2.4	10.8	2.3	7.5	3.2	0.2	0.8	2.1	0.2	0.1	0.1	0.4
18	1.9	9.2	2.0	71.3	2.9	0.2	0.7	2.1	0.2	0.1	0.1	0.4
19	1.6	7.8	1.3	195.4	2.5	0.2	0.6	2.1	0.2	0.1	0.1	0.4
20	1.3	66.0	2.5	137.2	2.3	0.2	0.6	2.1	0.2	0.1	0.1	0.4
21	1.0	35.7	2.2	94.3	2.0	0.2	0.5	2.1	0.2	0.1	0.1	0.4
22	0.9	23.9	1.9	85.3	1.8	0.2	0.5	2.1	0.2	0.1	0.1	0.4
23	1.1	164.4	1.7	75.6	1.6	0.2	0.4	2.1	0.2	0.1	0.1	0.4
24	0.9	32.9	1.5	66.9	1.4	0.2	0.4	2.1	0.2	0.1	0.1	0.4
25	0.7	20.9	1.2	59.3	1.2	0.2	0.4	2.1	0.2	0.1	0.1	0.4
26	0.6	13.3	1.0	52.5	1.1	0.2	0.3	2.1	0.2	0.1	0.1	0.4
27	0.5	11.5	0.9	46.5	1.0	0.2	0.3	2.1	0.2	0.1	0.1	0.4
28	0.4	10.0	0.8	41.2	0.9	0.2	0.3	2.1	0.2	0.1	0.1	0.4
29	0.3	8.7	0.7	36.5	0.8	0.2	0.2	2.1	0.2	0.1	0.1	0.4
30	0.3	7.6	0.6	32.3	0.7	0.2	0.2	2.1	0.2	0.1	0.1	0.4
31	0.2	1.9	28.6	0.6	0.9	0.2	0.2	2.1	0.2	0.1	0.1	0.4

WATER YEAR=1964

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	0.6	67.5	37.0	87.5	2.5	12.0	6.5	3.7	0.6	0.3	1.2
2	0.9	0.6	58.8	33.9	61.3	2.5	10.8	6.5	3.4	0.6	0.3	1.2
3	0.6	0.6	51.1	29.6	54.3	2.2	9.9	6.5	3.1	0.6	0.3	1.2
4	0.6	57.6	44.4	25.9	48.0	1.8	8.9	6.5	2.8	0.6	0.3	1.2
5	0.3	27.1	38.5	22.5	42.8	1.8	8.0	6.5	2.5	0.6	0.3	1.2
6	0.3	488.2	33.6	19.7	37.9	1.3	7.4	6.5	2.2	0.6	0.3	1.2
7	0.3	78.5	29.3	32.6	33.6	1.3	6.5	6.5	2.2	0.6	0.3	1.2
8	0.3	40.0	25.3	28.6	29.6	1.2	5.9	6.5	1.8	0.6	0.3	1.2
9	0.3	33.9	21.9	24.9	26.2	1.2	5.3	6.5	1.5	0.6	0.3	1.2
10	0.3	28.3	19.1	24.0	23.4	0.9	4.9	6.5	1.3	0.6	0.3	1.2
11	8.6	24.0	16.6	20.9	20.6	0.9	4.3	6.5	1.2	0.6	0.3	1.2
12	6.8	20.3	14.5	18.5	18.2	0.9	4.0	6.5	1.1	0.6	0.3	1.2
13	5.5	16.9	12.6	16.3	16.0	0.9	3.7	6.5	1.0	0.6	0.3	1.2
14	4.6	211.9	10.8	21.9	14.2	0.8	3.4	6.5	0.9	0.6	0.3	1.2
15	21.9	279.0	9.5	19.1	12.6	0.8	3.1	6.5	0.8	0.6	0.3	1.2
16	8.9	57.9	8.3	16.6	11.4	0.8	2.8	6.5	0.8	0.6	0.3	1.2
17	7.4	33.3	7.1	23.1	9.9	0.8	2.5	6.5	0.7	0.6	0.3	1.2
18	5.9	28.3	6.2	219.6	8.9	0.8	2.2	6.5	0.6	0.6	0.3	1.2
19	4.9	24.0	5.3	601.8	7.7	0.8	2.0	6.5	0.6	0.6	0.3	1.2
20	4.0	203.3	4.7	422.6	7.1	0.8	1.8	6.5	0.5	0.6	0.3	1.2
21	3.1	122.3	6.8	296.6	6.2	0.8	1.6	6.5	0.5	0.6	0.3	1.2
22	2.8	73.6	5.9	262.7	5.5	0.8	1.5	6.5	0.5	0.6	0.3	1.2
23	3.4	321.6	5.2	232.8	4.9	0.8	1.4	6.5	0.5	0.6	0.3	1.2
24	2.8	101.3	4.6	206.1	4.3	0.8	1.3	6.5	0.5	0.6	0.3	1.2
25	2.2	64.4	12.9	182.6	3.7	0.9	1.2	6.5	0.5	0.6	0.3	1.2
26	1.8	41.0	11.1	161.7	3.4	0.9	1.1	6.5	0.5	0.6	0.3	1.2
27	1.5	35.4	9.9	143.2	3.1	0.9	1.0	6.5	0.5	0.6	0.3	1.2
28	1.2	30.8	8.6	126.9	2.8	0.9	0.9	6.5	0.5	0.6	0.3	1.2
29	0.9	26.8	7.4	112.4	2.5	0.9	0.8	6.5	0.5	0.6	0.3	1.2
30	0.9	23.4	6.3	99.5	2.3	0.9	0.8	6.5	0.5	0.6	0.3	1.2
31	0.6	5.9	88.1	21.3	0.9	0.9	0.8	6.5	0.5	0.6	0.3	1.2

WATER YEAR=1965

ENCARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	7.3	9.2	60.7	24.7	19.0	28.8	14.2	10.0	6.0	6.0	6.0
2	4.0	67.0	9.1	52.1	23.0	17.9	27.3	13.6	10.0	6.0	6.0	6.0
3	4.0	33.0	8.9	303.6	21.4	16.9	24.2	12.9	10.0	6.0	6.0	6.0
4	4.0	35.0	8.8	192.9	20.0	15.9	24.9	12.4	10.0	6.0	6.0	6.0
5	4.0	10.0	8.7	134.5	41.6	15.2	23.7	11.8	10.0	6.0	6.0	6.0
6	4.0	10.0	8.6	356.4	39.0	15.8	22.6	11.2	10.0	6.0	6.0	6.0
7	4.0	10.0	8.5	188.3	36.5	23.5	21.5	10.7	10.0	6.0	6.0	6.0
8	4.0	10.0	8.4	80.7	34.1	22.5	21.3	10.2	10.0	6.0	6.0	6.0
9	4.0	105.9	8.4	74.2	31.9	21.3	122.5	10.0	10.0	6.0	6.0	6.0
10	4.0	87.3	8.3	68.3	29.8	20.1	133.2	10.0	10.0	6.0	6.0	6.0
11	4.0	35.0	8.2	66.3	27.9	19.1	73.1	10.0	10.0	16.0	6.0	6.0
12	4.0	14.5	8.6	61.1	26.1	18.0	69.5	10.0	10.0	3.9	6.0	6.0
13	4.0	10.0	8.5	56.3	24.4	17.1	66.0	10.0	10.0	3.9	6.0	6.0
14	4.0	10.0	8.4	51.8	22.9	16.6	63.0	10.0	10.0	3.9	6.0	6.0
15	4.0	10.0	8.5	47.7	21.5	15.7	62.0	10.0	10.0	3.9	6.0	6.0
16	4.0	10.0	8.4	44.0	20.1	15.0	64.9	10.0	6.0	3.9	6.1	6.0
17	4.0	10.0	8.3	40.5	18.8	14.3	60.7	10.0	6.0	3.9	6.1	6.0
18	4.0	10.0	8.4	37.3	17.4	14.0	63.9	10.0	6.0	3.9	6.1	6.0
19	4.0	10.0	29.1	34.5	16.5	14.0	62.0	10.0	6.0	6.0	6.1	6.0
20	4.0	10.0	31.0	32.0	15.5	14.0	78.0	10.0	6.0	3.9	6.1	6.0
21	4.0	10.0	31.1	29.5	14.5	14.0	74.1	10.0	6.0	3.9	6.1	6.0
22	4.0	10.0	813.6	27.4	14.0	14.0	70.5	10.0	6.0	6.0	6.0	6.0
23	4.0	10.0	844.6	25.5	14.0	14.0	67.0	10.0	6.0	3.9	6.0	6.0
24	4.0	10.0	216.4	44.6	14.0	14.0	63.7	10.0	6.0	3.9	6.0	6.0
25	4.0	10.0	77.4	60.0	14.0	14.0	60.4	10.0	6.0	6.0	6.0	6.0
26	4.0	7.9	112.2	58.0	14.0	14.0	57.4	10.0	6.0	3.9	6.0	6.0
27	4.0	9.6	88.5	52.1	21.5	14.0	54.5	10.0	6.0	6.0	6.0	6.0
28	4.0	9.4	122.2	48.4	20.2	30.2	52.1	10.0	6.0	3.9	6.0	6.0
29	18.9	9.2	294.9	45.0		28.7	49.5	10.0	6.0	6.0	6.0	6.0
30	27.8	9.0	130.3	41.8		27.3	47.1	10.0	6.0	3.9	6.0	6.0
31	12.5		113.8	38.9		26.4		10.0		6.0	6.0	

WATER YEAR=1965

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.2	6.3	1.2	59.7	61.7	43.0	72.8	25.2	5.7	3.7	1.0	0.6
2	0.1	66.0	1.1	51.1	56.0	39.9	48.5	22.6	5.4	3.5	0.9	0.6
3	0.1	30.7	0.9	302.6	31.4	36.9	44.2	19.9	5.2	3.3	0.9	0.5
4	0.1	14.3	0.8	191.9	48.0	33.9	59.9	18.4	4.9	3.2	0.8	0.5
5	0.1	6.7	0.7	152.5	112.6	31.7	55.7	16.8	4.7	3.0	0.8	0.5
6	0.1	5.5	0.6	353.4	105.0	33.8	52.6	15.2	4.4	2.9	0.7	0.5
7	0.1	4.6	0.5	187.3	99.5	57.5	49.5	12.7	4.2	2.7	0.7	0.5
8	0.1	3.8	0.4	79.7	94.1	54.5	143.3	10.2	4.0	2.6	0.7	0.5
9	0.1	104.9	0.4	73.2	88.5	51.3	360.5	2.8	3.8	2.5	0.6	0.5
10	0.1	26.3	0.3	67.3	83.8	48.1	455.2	8.3	3.8	2.1	0.6	0.5
11	0.1	13.3	0.7	65.3	78.9	45.1	268.1	7.9	3.4	1.2	0.6	0.5
12	0.1	13.5	0.6	60.1	74.1	42.0	196.5	7.5	3.3	2.1	0.6	0.5
13	0.1	7.4	0.5	55.3	69.4	39.1	184.0	7.2	3.1	2.0	0.5	0.5
14	0.1	6.3	0.4	50.8	64.9	36.6	177.0	6.8	2.9	1.9	0.5	0.5
15	0.1	5.3	0.5	46.7	60.5	33.7	222.0	6.5	2.8	1.8	0.5	0.5
16	0.1	4.5	0.4	43.0	56.1	31.0	235.9	6.1	2.7	1.7	0.4	0.5
17	0.1	3.8	0.3	39.5	51.8	28.3	232.7	5.8	2.5	1.6	0.4	0.5
18	0.1	3.3	0.4	36.3	47.6	25.6	227.9	5.5	2.4	1.5	0.4	0.5
19	0.1	2.8	0.3	33.5	43.5	24.0	221.0	5.3	2.3	1.5	0.4	0.5
20	0.1	2.4	0.3	31.0	39.5	22.4	212.0	5.0	2.2	1.4	0.4	0.5
21	0.1	2.0	0.3	28.5	35.5	20.8	203.1	4.7	2.1	1.3	0.3	0.5
22	0.1	1.6	0.2	26.4	31.6	19.3	194.5	4.5	2.0	1.3	0.3	0.5
23	0.1	1.1	0.1	24.5	27.8	17.8	184.0	4.3	1.9	1.2	0.3	0.5
24	0.1	0.8	0.1	21.4	24.0	16.3	177.7	4.1	1.8	1.1	0.3	0.5
25	0.1	0.6	0.1	18.4	20.3	14.8	169.6	3.9	1.7	1.1	0.3	0.5
26	0.1	0.5	0.1	15.4	16.6	13.4	161.6	3.7	1.6	1.0	0.3	0.5
27	0.1	0.4	0.1	12.4	13.4	12.2	153.3	3.5	1.5	1.0	0.3	0.5
28	0.1	0.3	0.1	9.4	10.4	11.2	145.1	3.3	1.4	0.9	0.3	0.5
29	0.1	0.2	0.1	6.4	7.4	10.2	136.5	3.1	1.4	0.9	0.3	0.5
30	0.1	0.1	0.1	3.4	4.4	9.2	127.1	3.0	1.3	0.8	0.3	0.5
31	0.1	0.1	0.1	0.4	1.4	8.2	118.1	2.8	1.2	0.7	0.3	0.5

WATER YEAR=1965

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.6	19.4	3.7	183.9	73.0	55.4	85.6	40.7	17.6	11.4	3.1	1.8
2	0.3	203.3	3.4	157.4	67.8	52.1	81.6	38.8	16.6	10.8	2.8	1.8
3	0.3	94.6	2.8	932.0	62.8	49.0	77.6	36.7	16.0	10.2	2.6	1.5
4	0.3	44.0	2.5	591.1	58.5	45.9	73.6	33.1	15.1	9.9	2.5	1.5
5	0.3	20.6	2.2	472.8	125.0	43.7	69.9	33.3	14.5	9.2	2.5	1.5
6	0.3	16.9	1.8	1094.6	117.0	45.6	66.5	31.4	13.6	8.9	2.2	1.5
7	0.3	14.2	1.5	576.9	109.3	49.3	63.1	29.9	12.9	8.3	2.2	1.3
8	0.3	11.7	1.2	245.5	101.9	66.2	138.0	28.3	12.3	8.0	2.2	1.5
9	0.3	323.1	1.2	225.5	95.2	62.5	374.2	27.1	11.7	7.7	1.8	1.5
10	0.3	265.8	0.9	277.3	87.7	58.8	468.8	25.6	11.1	7.1	1.8	1.5
11	0.3	47.1	2.2	191.1	42.7	33.7	222.1	24.3	10.5	37.6	1.8	1.5
12	0.3	41.6	1.8	177.3	37.3	32.4	211.0	23.1	10.2	6.5	1.8	1.5
13	0.3	22.8	1.5	170.3	72.1	49.4	200.2	22.2	9.5	6.2	1.5	1.5
14	0.3	19.4	1.2	156.5	67.5	48.0	197.1	20.9	8.9	5.9	1.5	1.5
15	0.3	16.3	1.0	143.8	63.1	45.3	187.9	20.0	8.6	5.5	1.5	1.5
16	0.3	13.9	0.8	132.4	58.8	43.1	258.4	18.8	8.3	5.2	1.2	1.5
17	0.3	11.7	0.9	121.7	54.8	41.0	245.5	17.9	7.7	4.9	1.2	1.5
18	0.3	10.2	1.2	111.8	51.1	38.8	255.3	16.9	7.4	4.6	1.2	1.5
19	0.3	8.6	0.8	103.2	47.7	37.0	249.5	16.3	7.1	4.4	1.2	1.5
20	0.3	7.4	1.5	93.5	44.7	35.1	237.2	15.4	6.8	4.3	1.2	1.5
21	0.3	6.2	277.5	87.8	41.6	33.3	225.1	14.5	6.5	4.0	0.9	1.5
22	0.3	11.1	2502.8	81.3	38.8	31.7	214.1	13.9	6.2	4.0	0.9	1.5
23	0.3	9.5	2598.3	75.5	36.3	30.2	203.3	13.2	5.9	3.7	0.9	1.5
24	0.3	8.0	663.4	195.9	33.9	28.6	193.1	12.6	5.5	3.4	0.9	1.5
25	0.3	6.8	235.3	181.7	31.7	27.1	183.6	12.0	5.2	3.4	0.9	1.5
26	0.3	5.9	342.5	169.4	29.6	25.9	174.3	11.4	4.9	3.1	0.9	1.5
27	0.3	4.9	267.5	157.4	27.6	23.3	165.7	10.8	4.6	3.1	0.9	1.5
28	7.4	4.3	373.3	146.0	25.1	21.7	157.4	10.2	4.3	2.8	0.9	1.5
29	35.1	3.7	905.2	135.5	23.0	20.0	149.4	9.5	4.0	2.8	0.9	1.5
30	82.5	3.1	398.2	125.7	21.0	18.0	142.0	9.2	4.0	2.5	0.9	1.5
31	35.4		347.4	116.7	19.0	16.0	135.0	8.6	3.8	2.5	0.9	1.5

WATER YEAR=1966

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	14.0	21.7	59.7	29.7	8.0	8.0	5.0	5.0	5.0	5.0
2	6.0	6.0	14.0	14.0	52.7	27.6	8.0	8.0	5.0	5.0	5.0	5.0
3	6.0	6.0	14.0	14.0	47.7	25.5	8.0	8.0	5.0	5.0	5.0	5.0
4	6.0	6.0	14.0	41.0	370.3	23.4	8.0	8.0	5.0	5.0	5.0	5.0
5	6.0	6.0	14.0	1394.3	182.3	31.2	8.0	8.0	5.0	5.0	5.0	5.0
6	6.0	6.0	13.9	591.8	72.2	28.9	8.0	8.0	5.0	5.0	5.0	5.0
7	6.0	6.0	13.8	231.6	65.9	27.7	8.0	8.0	5.0	5.0	5.0	5.0
8	6.0	6.0	13.3	91.3	60.1	23.7	8.0	8.0	5.0	5.0	5.0	5.0
9	6.0	6.0	13.1	36.4	34.9	23.9	8.0	8.0	5.0	5.0	5.0	5.0
10	6.0	6.0	12.9	29.8	30.3	29.7	8.9	8.0	5.0	5.0	5.0	5.0
11	6.0	6.0	12.8	24.5	46.0	27.7	8.7	8.0	5.0	5.0	5.0	5.0
12	6.0	6.0	12.6	20.2	42.0	25.8	11.8	8.0	5.0	5.0	5.0	5.0
13	6.0	8.2	12.5	16.6	38.4	27.2	11.1	8.0	5.0	5.0	5.0	5.0
14	6.0	73.2	12.3	14.0	35.0	23.4	10.5	8.0	5.0	5.0	5.0	5.0
15	6.0	33.0	12.4	14.0	32.0	23.7	10.0	8.0	5.0	5.0	5.0	5.0
16	6.0	34.0	12.4	14.0	29.3	22.3	9.6	8.0	5.0	5.0	5.0	5.0
17	6.0	14.0	12.4	14.0	24.8	20.8	9.2	8.0	5.0	5.0	5.0	5.0
18	6.0	13.7	12.4	14.0	24.5	19.4	8.8	8.0	5.0	5.0	5.0	5.0
19	6.0	14.0	12.4	14.0	24.5	19.2	8.4	8.0	5.0	5.0	5.0	5.0
20	6.0	14.0	12.4	14.0	48.3	17.9	8.0	8.0	5.0	5.0	5.0	5.0
21	6.0	14.0	12.4	14.0	44.4	16.8	8.0	8.0	5.0	5.0	5.0	5.0
22	6.0	14.0	12.4	14.0	40.8	15.7	8.0	8.0	5.0	5.0	5.0	5.0
23	6.0	14.0	12.4	14.0	48.9	14.7	8.0	8.0	5.0	5.0	5.0	5.0
24	6.0	23.8	12.4	14.0	47.4	13.8	8.0	8.0	5.0	5.0	5.0	5.0
25	6.0	12.2	14.0	14.0	43.8	12.9	8.0	8.0	5.0	5.0	5.0	5.0
26	6.0	14.0	14.0	14.0	48.4	12.1	8.0	8.0	5.0	5.0	5.0	5.0
27	6.0	14.0	14.0	14.0	44.8	12.0	8.0	8.0	5.0	5.0	5.0	5.0
28	6.0	14.0	14.0	14.0	41.4	12.0	8.0	8.0	5.0	5.0	5.0	5.0
29	6.0	14.0	101.5	14.0		12.0	8.0	8.0	5.0	5.0	5.0	5.0
30	6.0	14.0	68.7	20.3		12.0	8.0	8.0	5.0	5.0	5.0	5.0
31	6.0		186.4	17.7		12.0		8.0		5.0	5.0	

WATER YEAR=1966

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	0.9	4.5	20.7	58.7	21.7	2.2	5.6	3.4	0.2	0.5	3.2
2	2.5	0.7	3.8	12.6	51.7	65.6	5.0	5.4	3.3	0.2	0.5	3.0
3	2.0	0.5	3.2	10.9	46.7	59.5	4.7	5.1	3.1	0.2	0.5	2.9
4	1.9	0.4	2.7	40.0	369.3	52.6	4.5	4.8	2.9	0.2	0.5	2.7
5	1.9	0.4	2.2	1393.3	485.3	29.2	4.3	4.6	2.8	0.2	0.5	2.6
6	1.9	0.3	1.9	590.8	208.2	21.9	4.0	4.4	2.7	0.1	0.5	2.5
7	1.9	0.2	1.6	230.6	188.9	68.7	3.8	4.1	2.5	0.1	0.5	2.3
8	1.9	0.2	1.3	90.3	175.1	61.7	3.6	3.9	2.4	0.1	0.5	2.2
9	1.9	0.1	1.1	35.4	161.9	56.9	3.5	3.7	2.3	0.1	0.5	2.1
10	1.9	0.1	0.9	28.8	149.3	74.7	7.9	3.6	2.2	0.1	0.5	2.0
11	1.9	0.1	0.8	23.5	137.0	68.7	7.7	3.4	2.1	0.1	0.5	1.9
12	1.9	0.1	0.6	19.2	125.0	62.8	10.8	3.2	2.0	0.1	0.5	1.8
13	1.9	0.1	0.5	15.6	113.4	66.2	10.1	3.1	1.9	0.1	0.5	1.7
14	1.9	0.1	0.5	12.7	102.0	62.4	9.5	2.9	1.8	0.1	0.5	1.6
15	1.9	0.1	0.4	10.4	91.0	58.7	9.0	2.8	1.7	0.1	0.5	1.5
16	1.9	0.1	0.4	8.5	80.3	55.3	8.4	2.6	1.6	0.1	0.5	1.4
17	1.9	0.1	0.4	6.9	69.8	51.8	8.2	2.5	1.5	0.1	0.5	1.3
18	1.9	0.1	0.4	5.3	60.5	48.4	7.8	2.4	1.4	0.1	0.5	1.2
19	1.9	0.1	0.4	5.7	147.6	46.2	7.4	2.2	1.4	0.1	0.5	1.1
20	1.9	0.1	0.4	5.2	134.3	42.9	7.0	2.1	1.3	0.1	0.5	1.0
21	1.9	0.1	0.4	4.8	121.4	39.8	6.7	2.0	1.2	0.1	0.5	0.9
22	1.9	0.1	0.4	4.4	108.8	36.7	6.3	1.9	1.2	0.1	0.5	0.8
23	1.9	0.1	0.4	4.0	134.5	33.7	6.0	1.8	1.1	0.1	0.5	0.7
24	1.9	0.1	0.4	3.7	129.4	30.8	5.7	1.7	1.1	0.1	0.5	0.6
25	1.9	0.1	0.4	3.4	117.8	27.9	5.4	1.6	1.0	0.1	0.5	0.5
26	1.9	0.1	0.4	3.1	132.4	25.1	5.1	1.6	1.0	0.1	0.5	0.4
27	1.9	0.1	0.4	2.8	120.8	22.6	4.9	1.5	0.9	0.1	0.5	0.3
28	1.9	0.1	0.4	2.6	110.4	20.0	4.6	1.4	0.9	0.1	0.5	0.2
29	1.9	0.1	0.4	2.3	100.5	17.5	4.4	1.3	0.8	0.1	0.5	0.1
30	1.9	0.1	0.4	2.0	87.7	15.3	4.2	1.3	0.8	0.1	0.5	0.0
31	1.9	0.1	0.4	1.7	74.7	13.1	4.0	1.2	0.7	0.1	0.5	0.0

WATER YEAR=1966

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	2.8	13.9	63.8	180.8	88.4	16.0	17.2	10.5	0.6	1.5	9.9
2	7.7	2.2	11.7	38.8	159.2	81.9	15.4	16.6	10.2	0.6	1.5	9.2
3	6.2	1.5	9.9	33.6	143.8	75.5	14.5	15.7	9.5	0.6	1.5	8.9
4	5.9	1.2	8.3	123.2	1137.4	69.6	13.9	14.8	8.9	0.6	1.5	8.3
5	5.9	1.2	6.8	4291.4	496.8	93.0	13.2	14.2	8.6	0.6	1.5	8.0
6	5.9	0.9	5.9	1819.7	219.3	85.9	12.3	13.6	8.3	0.6	1.5	7.7
7	5.9	0.6	4.9	710.2	199.9	82.2	11.7	12.6	7.7	0.6	1.5	7.1
8	5.9	0.6	4.0	278.1	182.0	76.1	11.1	12.0	7.4	0.6	1.5	6.8
9	5.9	0.3	3.4	109.0	166.0	70.5	10.8	11.4	7.1	0.6	1.5	6.5
10	5.9	0.3	2.8	88.7	151.8	66.4	10.3	11.1	6.8	0.6	1.5	6.2
11	5.9	0.3	2.5	72.4	138.6	62.2	10.0	10.8	6.5	0.6	1.5	5.9
12	5.9	0.3	2.2	59.1	126.3	58.4	9.7	10.5	6.2	0.6	1.5	5.6
13	5.9	0.3	2.0	48.0	115.2	54.7	9.4	10.2	5.9	0.6	1.5	5.3
14	5.9	0.3	1.8	39.1	104.7	51.2	9.1	9.9	5.6	0.6	1.5	5.0
15	5.9	0.3	1.6	32.0	95.5	48.1	8.8	9.6	5.3	0.6	1.5	4.7
16	5.9	0.3	1.4	26.2	87.2	45.0	8.5	9.3	5.0	0.6	1.5	4.4
17	5.9	0.3	1.2	21.3	79.5	42.0	8.2	9.0	4.7	0.6	1.5	4.1
18	5.9	0.3	1.0	17.4	72.4	39.4	7.9	8.7	4.4	0.6	1.5	3.8
19	5.9	0.3	0.8	14.8	66.1	36.7	7.6	8.4	4.1	0.6	1.5	3.5
20	5.9	0.3	0.6	12.6	60.5	34.2	7.3	8.1	3.8	0.6	1.5	3.2
21	5.9	0.3	0.4	10.8	55.3	31.9	7.0	7.8	3.5	0.6	1.5	2.9
22	5.9	0.3	0.2	9.4	51.0	29.8	6.7	7.5	3.2	0.6	1.5	2.6
23	5.9	0.3	0.1	8.2	47.4	27.9	6.4	7.2	2.9	0.6	1.5	2.3
24	5.9	0.3	0.1	7.2	44.4	26.2	6.1	6.9	2.6	0.6	1.5	2.0
25	5.9	0.3	0.1	6.4	41.8	24.8	5.8	6.6	2.3	0.6	1.5	1.7
26	5.9	0.3	0.1	5.7	39.8	23.4	5.5	6.3	2.0	0.6	1.5	1.4
27	5.9	0.3	0.1	5.1	38.0	22.2	5.2	6.0	1.7	0.6	1.5	1.1
28	5.9	0.3	0.1	4.6	36.7	21.1	4.9	5.7	1.4	0.6	1.5	0.8
29	5.9	0.3	0.1	4.1	35.6	20.0	4.6	5.4	1.1	0.6	1.5	0.5
30	5.9	0.3	0.1	3.7	34.6	19.0	4.3	5.1	0.8	0.6	1.5	0.2
31	5.9	0.3	0.1	3.3	33.7	18.0	4.0	4.8	0.5	0.6	1.5	0.0

WATER YEAR=1969

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	4.0	30.0	59.9	72.8	231.9	15.8	10.0	10.0	6.0	5.9	6.0
2	5.0	14.0	10.0	54.5	69.2	125.4	24.4	10.0	10.0	6.0	6.0	6.0
3	5.0	15.0	9.8	49.6	65.4	172.2	22.7	10.0	10.0	6.0	5.9	6.0
4	5.0	8.1	9.6	45.2	62.5	89.4	23.9	10.0	10.0	6.0	6.0	6.0
5	5.0	7.0	5.3	41.1	90.6	85.6	29.3	10.0	10.0	6.0	5.9	6.0
6	5.0	6.0	9.1	37.5	140.6	79.0	44.2	10.0	10.0	6.0	6.0	6.0
7	5.0	5.2	9.0	34.1	72.9	73.4	42.1	10.0	10.0	6.0	6.0	6.0
8	5.0	4.3	10.0	31.1	69.3	68.8	40.1	10.0	10.0	6.0	5.9	6.0
9	5.0	4.0	17.7	28.3	1107.5	64.4	39.0	10.0	10.0	6.0	6.0	6.0
10	5.0	4.0	109.9	25.8	624.6	60.0	37.0	10.0	10.0	6.0	6.0	6.0
11	5.0	4.0	100.3	27.3	775.6	55.7	34.1	10.0	10.0	6.0	5.9	6.0
12	57.6	5.1	10.7	38.1	421.9	64.6	31.2	10.0	10.0	6.0	6.0	6.0
13	25.8	4.5	21.5	488.3	234.0	60.4	28.4	10.0	10.0	6.0	6.0	6.0
14	11.9	4.0	243.8	229.5	204.2	56.1	25.6	10.0	10.0	6.0	4.0	6.0
15	9.9	169.5	142.3	102.3	1695.1	52.8	22.8	10.0	10.0	6.0	5.9	6.0
16	8.3	35.3	53.9	45.9	913.5	49.7	21.1	10.0	6.0	6.0	6.0	6.0
17	7.0	33.0	41.3	43.1	508.5	77.6	12.4	10.0	6.0	6.0	6.0	6.0
18	6.0	12.0	31.6	62.7	359.7	73.1	17.0	10.0	6.0	6.0	6.0	6.0
19	5.1	10.4	24.7	547.1	189.1	67.6	18.0	10.0	6.0	6.0	6.0	6.0
20	5.0	10.0	19.0	701.2	178.9	64.2	16.0	10.0	6.0	6.0	5.9	6.0
21	5.0	10.0	14.8	544.3	168.7	93.8	16.0	10.0	6.0	6.0	6.0	6.0
22	5.0	10.0	11.5	262.0	171.6	87.9	16.0	10.0	6.0	6.0	6.0	6.0
23	5.0	10.0	10.6	126.1	210.2	82.2	16.0	10.0	6.0	6.0	6.0	6.0
24	5.0	10.0	350.9	69.9	448.5	76.3	16.0	10.0	6.0	6.0	6.0	6.0
25	5.0	10.0	282.0	92.1	261.8	71.9	16.0	10.0	6.0	6.0	6.0	6.0
26	5.0	10.0	128.8	322.7	256.1	47.4	16.0	10.0	6.0	6.0	6.0	6.0
27	5.0	10.0	52.3	162.5	242.6	63.0	16.0	10.0	6.0	6.0	6.0	6.0
28	5.0	10.0	470.4	93.5	625.0	58.7	16.0	10.0	6.0	6.0	6.0	6.0
29	5.0	10.0	196.1	67.4		54.4	16.0	10.0	6.0	6.0	6.0	6.0
30	5.0	9.7	82.1	147.7		51.2	16.0	10.0	6.0	6.0	6.0	6.0
31	5.0		74.7	74.9		47.0	10.0		6.3	6.0		

WATER YEAR=1969

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.6	0.9	2.4	52.9	205.8	236.9	30.8	5.8	2.9	2.3	0.9	2.7
2	0.5	13.0	2.1	53.5	195.2	128.4	22.4	5.5	2.7	2.2	0.9	2.5
3	0.4	14.0	1.8	48.6	184.8	179.2	19.7	5.3	2.6	2.0	0.8	2.4
4	0.3	7.1	1.6	44.2	174.5	94.4	17.9	5.0	2.5	1.9	0.9	2.3
5	0.2	6.0	1.3	40.1	260.6	88.6	32.3	4.8	2.3	1.8	0.7	2.2
6	0.2	5.0	1.1	36.5	614.6	83.0	32.2	4.5	2.2	1.8	0.7	2.1
7	0.1	4.2	1.0	33.1	206.9	77.4	29.1	4.3	2.1	1.7	0.7	2.0
8	0.1	3.5	0.9	30.1	195.3	71.8	28.1	4.1	2.0	1.6	0.6	2.0
9	0.1	3.0	0.8	27.3	1110.5	67.4	27.0	3.9	1.9	1.5	0.6	2.0
10	0.1	2.5	0.7	24.8	627.6	64.0	25.0	3.7	1.8	1.4	0.6	2.0
11	0.1	2.1	0.6	22.3	777.6	60.7	24.1	3.5	1.7	1.4	0.5	2.0
12	56.6	4.1	29.7	37.1	424.9	69.6	22.2	3.3	1.6	1.3	0.5	2.0
13	24.8	3.5	20.5	487.3	219.0	66.4	20.4	3.2	1.6	1.2	0.5	2.0
14	10.9	2.9	242.8	228.5	207.2	62.1	18.6	3.0	1.5	1.2	0.5	2.0
15	8.9	168.5	147.3	101.3	1498.1	58.8	16.8	2.8	1.4	1.1	0.4	2.0
16	7.3	34.3	52.9	125.9	916.5	54.7	16.1	2.7	1.3	1.1	0.4	2.0
17	6.0	19.4	40.3	118.1	491.5	82.6	14.4	2.6	1.3	1.0	0.4	2.0
18	5.0	11.0	30.6	115.7	362.7	78.1	12.7	2.4	1.2	0.9	0.4	2.0
19	4.1	9.4	23.7	1669.9	192.1	72.6	12.1	2.3	1.1	0.9	0.4	2.0
20	3.4	8.0	18.0	2141.2	181.9	89.2	11.4	2.2	1.1	0.9	0.3	2.0
21	2.8	6.8	13.8	1658.3	171.7	94.8	10.9	2.1	1.0	0.8	0.3	2.0
22	2.3	5.9	10.5	803.0	190.6	89.9	10.3	2.0	1.0	0.8	0.3	2.0
23	1.9	5.0	9.6	370.1	213.2	85.2	10.6	1.9	0.9	0.7	0.3	2.0
24	1.5	4.3	349.9	196.9	451.5	80.5	10.1	1.8	0.9	0.7	0.3	2.0
25	1.3	3.7	281.0	265.1	264.8	75.9	9.6	1.7	0.8	0.7	0.3	2.0
26	1.0	3.1	127.8	975.7	259.1	71.4	9.1	1.6	0.8	0.7	0.3	2.0
27	0.8	2.7	51.5	482.5	245.6	67.0	8.7	1.5	0.8	0.7	0.3	2.0
28	0.7	2.3	469.4	245.5	629.0	62.7	8.2	1.5	0.7	0.7	0.3	2.0
29	0.6	2.0	195.1	122.4		59.4	7.8	1.4	0.7	0.7	0.3	2.0
30	1.6	1.7	81.1	436.7		56.2	7.4	1.3	0.6	0.7	0.3	2.0
31	1.4		73.7	212.9		53.0		1.3		1.0	0.3	

WATER YEAR=1969

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.8	7.4	181.4	221.1	252.3	43.6	17.9	8.9	7.1	2.8	8.3
2	1.5	40.0	5.3	164.8	210.1	142.9	44.4	16.9	8.3	6.8	2.8	7.7
3	1.2	43.1	5.3	149.7	199.6	191.6	48.4	16.3	8.0	6.2	2.5	7.4
4	0.9	21.9	4.9	136.1	189.4	109.0	45.9	15.4	7.7	5.9	2.5	7.1
5	0.8	18.5	4.0	123.5	278.0	103.5	68.7	14.8	7.1	5.5	2.2	6.8
6	0.6	13.4	3.4	112.4	430.0	98.6	68.4	13.9	6.8	5.5	2.2	6.5
7	0.3	12.9	3.1	101.9	221.5	93.6	63.0	12.2	6.5	5.2	2.2	6.2
8	0.3	10.8	16.6	92.7	210.4	88.7	61.9	12.6	6.2	4.9	1.8	6.2
9	0.3	9.2	51.4	84.1	1125.7	84.4	61.6	12.0	5.9	4.6	1.8	6.2
10	0.3	7.7	335.4	76.4	642.5	80.1	58.5	11.4	5.5	4.3	1.8	6.2
11	0.3	6.5	305.8	81.0	793.4	76.1	55.7	10.9	5.2	4.3	1.5	6.2
12	174.3	12.6	91.5	114.3	440.1	85.0	52.0	10.7	5.0	4.0	1.5	6.2
13	76.4	10.8	63.1	1500.9	234.1	81.3	50.8	9.9	4.9	4.0	1.5	6.2
14	33.6	8.9	747.8	703.8	232.4	77.3	48.6	9.2	4.6	4.0	1.5	6.2
15	27.4	519.0	450.7	312.0	1712.8	73.3	43.6	8.6	4.0	4.0	1.2	6.2
16	22.5	105.6	162.9	138.0	931.7	69.9	43.4	8.3	4.0	3.4	1.2	6.2
17	18.5	59.8	124.1	129.7	506.7	97.3	41.3	8.0	4.0	3.1	1.2	6.2
18	15.4	33.9	94.2	128.4	377.9	92.7	39.1	7.4	3.7	2.8	1.2	6.2
19	12.6	29.0	75.0	1682.0	206.7	88.1	37.3	7.1	3.4	2.8	1.2	6.2
20	10.5	24.6	55.4	2156.6	196.8	83.8	35.1	6.8	3.4	2.8	0.9	6.2
21	8.6	20.9	42.5	1673.4	187.0	113.3	33.6	6.5	3.1	2.5	0.9	6.2
22	7.1	18.2	32.3	803.9	189.7	107.5	31.7	6.2	3.1	2.5	0.9	6.2
23	5.9	15.4	29.6	385.3	228.5	102.3	32.6	5.9	2.8	2.2	0.9	6.2
24	4.6	13.2	1077.7	212.2	466.6	97.0	31.1	5.5	2.8	2.2	0.9	6.2
25	4.0	11.4	865.5	280.6	279.7	92.1	29.6	5.2	2.5	2.2	0.9	6.2
26	3.1	9.5	393.6	990.8	274.4	87.5	28.0	4.9	2.5	2.2	0.9	6.2
27	2.5	8.3	158.6	497.4	260.6	83.2	26.8	4.6	2.5	2.2	0.9	6.2
28	2.2	7.1	1445.8	284.9	643.7	79.2	25.3	4.6	2.2	2.2	0.9	6.2
29	1.8	6.2	600.9	142.9		75.2	24.0	4.3	2.2	2.2	0.9	6.2
30	4.9	5.2	249.8	451.8		71.5	22.8	4.0	1.8	2.2	0.9	6.2
31	4.3		227.0	227.6		67.8		4.0		3.1	0.9	

WATER YEAR=1970

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	6.0	14.0	42.2	140.1	14.0	10.0	10.0	6.0	6.0	6.0
2	6.0	6.0	6.0	14.0	58.9	134.5	14.0	10.0	10.0	6.0	6.0	6.0
3	6.0	6.0	6.0	14.0	34.7	123.9	14.0	10.0	10.0	6.0	6.0	6.0
4	6.0	6.0	6.0	14.0	31.3	214.1	14.0	10.0	10.0	6.0	6.0	6.0
5	6.0	17.1	6.0	14.0	47.4	206.6	14.0	10.0	10.0	6.0	6.0	6.0
6	6.0	14.4	6.0	14.0	44.3	111.9	14.0	10.0	10.0	6.0	6.0	6.0
7	6.0	12.2	6.0	14.0	41.3	105.8	14.0	10.0	10.0	6.0	6.0	6.0
8	6.0	10.4	6.0	14.0	38.3	110.1	14.0	10.0	10.0	6.0	6.0	6.0
9	6.0	8.8	6.0	48.4	35.4	103.0	14.0	10.0	10.0	6.0	6.0	6.0
10	6.0	7.6	6.0	106.4	33.6	98.3	14.0	10.0	10.0	6.0	6.0	6.0
11	6.0	16.9	6.0	48.7	30.8	92.4	14.0	10.0	10.0	6.0	6.0	6.0
12	6.0	6.8	9.7	30.2	42.8	86.7	14.0	10.0	10.0	6.0	6.0	6.0
13	6.0	6.6	35.0	53.9	135.8	81.0	14.0	10.0	10.0	6.0	6.0	6.0
14	6.0	6.5	35.0	1479.0	146.3	76.7	14.0	10.0	10.0	6.0	6.0	6.0
15	6.0	6.4	35.0	686.3	137.6	72.2	14.0	9.5	10.0	6.0	6.0	6.0
16	108.0	6.4	14.0	824.9	130.1	67.6	14.0	10.0	6.0	6.0	6.0	6.0
17	13.1	6.3	14.0	397.9	374.4	63.2	14.0	10.0	6.0	6.0	6.0	6.0
18	6.4	6.3	14.0	192.0	205.5	38.9	14.0	10.0	6.0	6.0	6.0	6.0
19	6.0	6.2	133.6	93.0	193.9	34.6	14.0	10.0	6.0	6.0	6.0	6.0
20	6.0	6.2	930.1	247.2	183.5	51.3	14.0	10.0	6.0	6.0	6.0	6.0
21	6.0	6.1	457.9	4994.3	173.2	48.2	14.0	10.0	6.0	6.0	6.0	6.0
22	6.0	6.2	174.5	2734.9	164.1	45.1	14.0	10.0	6.0	6.0	6.0	6.0
23	6.0	6.1	73.3	1597.6	155.1	42.0	14.0	10.0	6.0	6.0	6.0	6.0
24	6.0	6.0	476.5	1655.7	146.3	39.0	14.0	10.0	6.0	6.0	6.0	6.0
25	6.0	6.1	201.1	884.9	137.6	36.1	14.0	10.0	6.0	6.0	6.0	6.0
26	6.0	6.1	83.6	468.3	130.1	33.1	14.0	10.0	6.0	6.0	6.0	6.0
27	6.0	6.0	35.1	594.8	122.7	30.3	14.0	10.0	6.0	6.0	6.0	6.0
28	6.0	6.0	31.8	319.1	132.8	26.5	14.0	10.0	6.0	6.0	6.0	6.0
29	6.0	6.0	28.9	166.1	132.7	23.7	14.0	9.9	6.0	6.0	6.0	6.0
30	6.0	6.0	26.3	83.7	121.0	21.0	14.0	10.0	6.0	6.0	6.0	6.0
31	6.0	6.0	23.9	82.1	118.3	18.3	9.9	6.0	6.0	6.0	6.0	6.0

WATER YEAR=1970

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.7	0.5	0.1	11.4	100.2	159.1	9.4	4.3	2.2	2.2	1.0	1.0
2	0.5	0.5	0.1	10.3	93.9	140.5	8.9	4.1	2.2	2.1	1.0	1.0
3	0.4	0.4	0.1	8.3	87.7	133.0	8.4	3.9	2.1	2.0	0.9	0.9
4	0.3	0.3	0.1	6.4	81.5	222.1	8.0	3.7	2.0	1.9	0.9	0.9
5	0.3	16.1	0.1	2.6	75.4	214.6	7.6	3.5	1.9	1.8	0.8	0.9
6	0.2	13.4	0.1	2.1	69.3	119.9	7.2	3.3	1.8	1.7	0.8	0.9
7	0.2	11.2	0.1	6.7	63.3	113.8	6.9	3.1	1.7	1.6	0.8	0.9
8	0.1	9.4	0.1	6.4	57.3	115.1	6.5	3.0	1.6	1.5	0.7	0.9
9	0.1	7.8	0.1	67.4	50.4	111.0	6.2	2.8	1.5	1.4	0.7	0.9
10	0.1	6.2	0.1	105.4	43.4	106.3	5.9	2.7	1.5	1.3	0.7	0.9
11	0.1	5.5	2.1	47.7	36.1	101.4	5.6	2.6	1.4	1.2	0.6	0.9
12	0.1	4.6	8.7	49.2	48.2	96.7	5.3	2.4	1.3	1.2	0.6	0.9
13	0.1	3.8	22.7	52.9	141.2	92.0	5.1	2.3	1.2	1.1	0.6	0.9
14	0.1	3.2	13.1	2366.0	152.3	87.7	4.8	2.2	1.2	1.1	0.5	0.9
15	3.5	2.7	7.8	2096.3	143.6	83.2	4.6	2.1	1.1	1.0	0.5	0.9
16	107.0	2.3	4.6	2524.9	136.1	78.6	4.3	2.0	1.0	1.0	0.5	0.9
17	12.1	1.9	12.9	1210.9	130.4	74.2	4.1	1.9	1.0	0.9	0.5	0.9
18	5.4	1.6	8.2	576.0	211.5	70.9	3.9	1.8	0.9	0.9	0.4	0.9
19	4.5	1.3	132.6	271.0	199.9	66.6	3.7	1.7	0.9	0.9	0.4	0.9
20	3.7	1.1	929.1	247.2	189.5	62.3	3.5	1.6	0.8	0.9	0.4	0.9
21	3.0	0.9	456.9	4992.3	179.2	58.2	3.4	1.5	0.8	0.9	0.4	0.9
22	2.5	0.8	175.5	2734.9	170.1	54.1	3.2	1.5	0.7	0.9	0.4	0.9
23	2.1	0.6	72.3	1592.6	161.1	51.0	3.0	1.4	0.7	0.9	0.3	0.9
24	1.7	0.5	473.5	1656.7	152.3	48.0	2.9	1.3	0.7	0.9	0.3	0.9
25	1.4	0.5	200.1	883.9	143.6	45.7	2.7	1.3	0.6	0.9	0.3	0.9
26	1.2	0.4	82.6	469.3	136.1	42.1	2.6	1.2	0.6	0.9	0.3	0.9
27	1.0	0.3	34.1	593.8	122.7	33.3	2.5	1.1	0.6	0.9	0.3	0.9
28	0.8	0.3	30.8	312.1	165.2	20.5	2.3	1.1	0.5	0.9	0.3	0.9
29	0.7	0.3	27.9	167.1	18.7	18.7	2.2	1.0	0.5	0.9	0.3	0.9
30	0.5	0.3	25.3	85.7	17.0	17.0	2.1	1.0	0.5	1.2	1.1	0.9
31	0.4	0.3	22.9	81.1	15.3	15.3	0.9	0.9	1.1	1.1	1.1	0.9

WATER YEAR=1970

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.5	0.3	35.1	80.7	160.5	29.0	13.2	7.1	6.8	3.1	3.1
2	1.5	1.5	0.3	31.7	76.7	152.5	27.4	12.6	6.8	6.5	3.1	3.1
3	1.2	1.2	0.3	28.6	73.0	144.8	25.9	12.0	6.5	6.2	2.8	2.8
4	0.9	0.9	0.3	25.9	69.3	234.4	24.6	11.4	6.2	5.9	2.8	2.8
5	0.9	49.6	0.3	23.4	65.9	226.7	23.4	10.8	5.9	5.5	2.5	2.8
6	0.6	41.3	0.3	21.9	62.5	132.1	22.2	10.2	5.5	5.2	2.5	2.8
7	0.6	34.5	0.3	20.6	59.4	125.7	21.3	9.5	5.2	4.9	2.5	2.8
8	0.3	29.0	0.3	19.7	56.4	129.7	20.0	9.2	4.9	4.6	2.2	2.8
9	0.3	24.0	0.3	146.0	53.4	123.2	19.1	8.6	4.6	4.3	2.2	2.8
10	0.3	20.3	0.3	324.6	51.1	116.0	18.2	8.3	4.4	4.0	2.2	2.8
11	0.3	16.9	6.5	146.9	48.7	112.1	17.2	8.0	4.3	4.0	1.8	2.8
12	0.3	14.2	26.8	121.5	46.2	106.9	16.3	7.4	4.0	3.7	1.8	2.8
13	0.3	11.7	69.9	107.5	43.6	101.6	15.4	7.1	3.7	3.4	1.8	2.8
14	0.3	9.9	40.3	4552.7	40.3	97.6	14.7	6.8	3.7	3.4	1.5	2.8
15	10.8	8.3	24.0	2110.7	35.8	92.0	14.2	6.5	3.4	3.1	1.5	2.8
16	329.6	7.1	14.2	2537.6	148.1	88.1	13.2	6.2	3.1	2.8	1.5	2.8
17	37.3	5.9	39.7	1222.5	392.4	83.8	12.6	5.9	3.1	2.8	1.5	2.8
18	16.6	4.9	25.3	588.3	223.3	79.8	12.0	5.5	2.8	2.8	1.5	2.8
19	13.9	4.0	408.4	283.4	212.2	75.8	11.4	5.2	2.8	2.8	1.5	2.8
20	11.4	3.4	2861.6	259.3	201.7	71.8	10.8	4.9	2.5	2.8	1.2	2.8
21	9.2	2.8	1407.3	5005.9	191.6	68.4	10.5	4.6	2.5	2.8	1.2	2.8
22	7.7	2.5	540.5	2747.1	182.0	65.0	9.9	4.6	2.5	2.8	1.2	2.8
23	6.5	1.8	222.7	1609.6	172.8	61.6	9.2	4.3	2.2	2.8	0.9	2.8
24	5.2	1.5	1464.3	1668.4	164.2	58.5	8.9	4.0	2.2	2.8	0.9	2.8
25	4.3	1.5	616.3	899.1	155.8	55.7	8.3	4.0	1.8	2.8	0.9	2.8
26	3.7	1.2	254.4	484.5	148.1	52.7	8.0	3.7	1.8	2.8	0.9	2.8
27	3.1	0.9	105.0	609.2	140.8	50.2	7.7	3.4	1.8	2.8	0.9	2.8
28	2.5	0.9	94.9	332.9	128.0	47.7	7.1	3.4	1.5	2.8	0.9	2.8
29	2.2	0.9	85.9	182.0	45.3	45.3	6.8	3.1	1.5	2.8	0.9	2.8
30	1.5	0.9	77.9	100.7	43.1	43.1	6.3	3.1	1.5	3.7	3.4	2.8
31	1.2	0.9	70.5	95.8	41.0	41.0	2.8	2.8	3.4	3.4	3.4	2.8

Table 5. Total acre-feet of water spilled over and released above Shafter Bridge each month in the operation study plan 7. Data from Dana Roxon, MMWD. July 1988.

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1955	416	485	310	64	339	435	263	195	237	277	269	262	3,552
1956	210	145	104	16,301	4,206	694	772	83	393	372	410	359	24,049
1957	393	341	591	579	202	61	74	67	83	162	221	243	3,017
1958	65	455	326	67	21,241	6,230	19,368	311	287	546	527	576	49,999
1959	608	309	576	558	184	288	166	324	212	184	214	163	3,786
1960	208	125	170	111	57	61	107	301	261	207	300	301	2,209
1961	213	71	344	408	57	91	61	147	188	122	221	166	2,089
1962	145	195	408	385	111	61	103	147	154	118	165	206	2,198
1963	140	198	117	642	55	102	4,255	212	445	509	521	492	7,688
1964	556	288	528	232	369	314	280	239	137	238	239	222	3,642
1965	217	376	311	61	75	118	59	230	356	372	460	445	3,080
1966	371	514	648	305	55	71	161	313	189	300	276	191	3,394
1967	227	230	113	26,148	4,525	4,043	11,391	392	91	510	521	541	48,732
1968	522	383	714	384	67	61	207	325	248	259	248	235	3,653
1969	203	201	174	61	13,572	2,625	290	430	447	418	460	352	19,233
1970	393	324	377	15,895	3,619	2,663	541	479	461	412	455	421	26,040
1971	375	594	61	61	163	298	239	282	451	484	473	450	3,931
1972	435	206	186	346	83	142	86	239	187	239	239	222	2,610
1973	136	106	68	7,148	13,759	8,084	513	387	470	477	485	422	32,055
1974	342	116	61	27,143	7,779	29,133	13,700	418	589	362	571	569	80,783
1975	521	336	571	444	55	61	59	253	398	449	485	457	4,089
1976	361	178	486	678	314	306	340	325	231	203	215	178	3,815
1977	221	156	142	61	55	61	59	61	59	61	61	59	1,056
1978	61	59	61	61	55	61	1,234	261	421	473	454	321	3,522
1979	588	513	714	348	127	74	102	128	202	258	159	160	3,373
1980	237	204	381	61	57	1,662	230	368	380	418	442	383	4,823
1981	380	351	739	518	120	73	128	283	116	149	138	178	3,173
1982	108	134	142	7,223	8,026	8,112	10,115	344	534	503	422	349	36,012
1983	520	125	158	292	15,703	28,751	2,308	409	392	435	546	539	50,178
1984	302	71	3,242	2,563	949	2,991	352	467	443	450	468	478	12,826
AVERAGE	316	260	429	3,638	3,199	3,258	2,250	281	302	332	356	331	14,952
SPILL AVERAGE	0	0	108	3,382	3,085	3,139	2,092	21	0	0	0	0	11,827
RELEASE AVERAGE	316	260	321	256	114	119	158	260	302	332	356	331	3,125
NUMBER OF SPILL EVENTS	0	0	1	7	10	11	11	3	0	0	0	0	43

Table 6. Criteria for evaluation of the effects of flow on salmon and steelhead in Lagunitas Creek. All flows are mean daily flows measured at SPTSP gage.

Adult Migration: Salmon, Nov 1 - Jan 15; Steelhead, Jan 1 - Feb 28.

Good: Three or more attraction and passage flows of 35 cfs or more for 3 consecutive days.

Fair: Two attraction and passage flows as above.

Poor: One attraction and passage flow as above.

None: None.

Spawning and Embryo Incubation: From first attraction flow to February 1 for salmon and to March 31 for steelhead.

Good: Minimum flow >12 cfs.

Fair: Minimum flow 10-12 cfs.

Poor: Minimum flow 5-10 cfs.

Minimal: Minimum flow <5 cfs.

Scour: Timing same as for spawning and embryo incubation.

Minimal = good: Flow never exceeded 1,000 cfs during the incubation period.

Modest = Fair: Flow exceeded 1,000 cfs one day.

High = Poor: Flow exceeded 1,000 cfs 2-5 days.

Very High = Minimal: Flow exceeded 1,000 cfs more than 5 days.

Juvenile Rearing: Lowest mean daily flow of summer.

Good: >5 cfs

Fair: 2-5 cfs

Poor: 0.5-2 cfs

Minimal: <0.5 cfs

Table 7. Evaluation of the quality of the instream flows in Lagunitas Creek that would have occurred in the 30-year period between 1955 and 1984 had the enlarged Kent Dam been in place and operated according to rules of Table 1. Figures are numbers of years in each category. Criteria for rating "good", etc., are in Table 6.

EVALUATION	<u>ADULT MIGRATION</u>		<u>SPAWNING AND EMBRYO INCUBATION</u>		<u>SCOUR¹</u>		JUVENILE REARING
	Salmon	Steelhead	Salmon	Steelhead	Salmon	Steelhead	
GOOD	20	26	18	15	19	19	16
FAIR	4	1	5	13	6	2	13
POOR	4	1	4	1	3	6	1
MINIMAL	2	2	3	1	2	3	0

¹ GOOD = Minimal scour; FAIR = Modest scour; POOR = High scour;
MINIMAL = Very high scour.

Table 8. Mean monthly flows (cfs) measured by the USGS at the Samuel P. Taylor gage and at the Pt. Reyes gage in Lagunitas Creek 1985-1986 and 1986-1987.

1985-86	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
SPTSP	5.1	10.6	22.5	87.1	421.0	217.0	12.6	10.2	7.0	6.3	4.8	5.2
PT. REYES	5.8	14.1	29.2	137.0	1193.0	482.0	25.4	12.5	7.2	5.7	4.7	5.4
LOSS OR GAIN	+0.7	+3.5	+6.7	+49.9	+772.0	+265.0	+12.8	+2.3	+0.2	-0.6	-0.1	+0.2
1986-87												
SPTSP	4.3	4.7	6.8	23.2	65.1	37.1	8.4	7.4	6.3	6.0	5.7	5.5
PT. REYES	5.1	5.8	7.8	29.0	170.0	109.0	13.3	9.1	6.4	5.3	5.3	4.6
LOSS OR GAIN	+0.8	+1.1	+1.0	+5.8	+104.9	+71.9	+4.9	+1.7	+0.1	-0.7	-0.4	-0.9

temporary dam at the head of the estuary. Near the head of this pond, the North Marin Water District can divert up to 1.02 cfs from shallow wells. The average 1987 diversion of both the Giacomini Ranch and the North Marin Water District was 2.93 cfs (Nelson et al 1987). Because of these diversions, summer streamflows entering the estuary are usually 2-4 cfs less than those just above the impoundment.

These diversions are not likely to cause a significant problem for adult salmon and steelhead migrating upstream because those migrations are triggered by storm flows or by release of water during periods when the diversions are very low or nonexistent. During the summer there is no significant migration or emigration and the instream flow requirements are designed to provide appropriate amounts of rearing habitat for juvenile salmon and steelhead and to protect the other flora and fauna in Lagunitas Creek before it reaches the estuary.

The period when these diversions could have the greatest effect would be in May and June when the juvenile salmon are emigrating in large numbers. During that period the flows released for emigration should be allowed to reach Tomales Bay.

RELEASES FROM NICASIO RESERVOIR

The evaluation of how the operation described in this report would affect salmon and steelhead is based on the assumption that the reservation of water in Nicasio Reservoir for mitigation of damage done by the Nicasio Reservoir Project and used for releases to protect fish in Lagunitas Creek has been transferred to the Kent Project. In the operation study, Nicasio Reservoir fills and spills regularly and by doing so contributes significantly to providing flows for upstream migration in the lower part of Lagunitas Creek. But the evaluation assumes that there are no special water releases from Nicasio for fish. The logic of this is that the operation study attempts to squeeze as much water as possible out of the entire Lagunitas watershed for the benefit of both instream and out-of-stream uses. Because there is only a 1/2 mile reach of Nicasio Creek remaining below the Nicasio Dam, and 4 miles of relatively poor salmonid habitat in Lagunitas Creek below there, release of stored water would benefit the fish more if made from above Shafter Bridge.

THE CALIFORNIA FRESHWATER SHRIMP (Syncaris pacifica)

The small, California freshwater shrimp Syncaris pacifica is found in Lagunitas Creek within the Samuel P. Taylor State Park and downstream to the mouth of Nicasio Reservoir (Li 1981). Syncaris pacifica cannot swim against any significant current and cannot tolerate brackish water if swept into the bay

during a winter storm. To protect itself, the population takes refuge underneath hollowed out banks where the individuals hang on to finely divided root systems of willow, alders, and other plants. In the summer they inhabit the quiet water where there is submerged vegetation including blackberry and tree branches that hang into the water.

Syncaris pacifica could not tolerate high summer flows. Any summer flows that would create visible current in their habitat would be detrimental. We believe the flows recommended in this report are suitable.

A sediment management plan to prevent the filling under hollow banks with sand during high flows is one of the most important steps that can be taken to protect this valuable animal.

CHAPTER 4 - STREAMBED STANDARDS

The continued deposition of coarse sediment (gravel, cobble, and boulders) is crucial for the reproduction and survival of salmon and steelhead which need such material for spawning, egg incubation, and juvenile rearing. On the other hand, excessive accumulation of fine sediment (sand, silt, and clay) is detrimental and reduces the ability of salmon and steelhead to reproduce and the juveniles to survive. The enlarged Kent Reservoir will not change the contribution of either coarse or fine sediment to Lagunitas Creek; but, by reducing the frequency, magnitude, and duration of flushing flows, it will affect the movement of bed material through and out of the stream. MMWD has retained geomorphologist Barry Hecht for several years to define and help develop solutions to whatever problems may be created.

PHASES OF LIFE CYCLE AFFECTED BY STREAMBED COMPOSITION

Our analysis in Volume I indicates that substrate conditions interact with streamflow to determine the quality and quantity of spawning, incubation, and juvenile rearing habitat in Lagunitas Creek. The following is a description of how substrate and streamflow interact to affect the life cycle of these species.

Spawning--The Need for Gravel

Adult salmon and steelhead use the gravel in the tails of glides and heads of riffles for constructing their nests and spawning. In Volume I, we estimated that the average female salmon used about 128 square feet of the gravel-covered streambed for spawning and that steelhead used about 241 square feet. In Lagunitas Creek, as in all streams, the quantity of gravel, its distribution in the streambed, and its size class composition affect the amount of streamflow needed for spawning.

Measurements made in Lagunitas Creek during 1984 and 1985 indicate that at flows of 16 cfs there is room for about 279 female salmon and 113 female steelhead to spawn. Any change in the amount of gravel covering the streambed area or in size-class composition will affect the amount of spawning habitat available at a given flow. Because of this, one of the goals of operating this project should be to insure adequate supplies of spawning gravel in the important spawning reach between Chafer and Tocaloma Bridges.

Incubation

Salmon and steelhead eggs incubate in their gravel redds for about 7 weeks before they hatch. During this period

they can be subjected to high flows which scour them out of the nests or, if enough very fine or organic sediment is deposited, to low dissolved oxygen which causes mortality before the eggs hatch. The high flows in Lagunitas Creek scoured many of the salmon nests in 1983 and 1984 and probably do so in many years. The amount of fine sand and clay in nests was well below the level known to suffocate eggs, and dissolved oxygen levels in the redds were above levels necessary for good survival.

Fry Emergence

After hatching, salmon and steelhead alevins reside in the nests for another 3 weeks, absorb the remainder of their yolk, and then swim up through the gravel and emerge into the stream. During this period they are susceptible to the accumulation of fine sediment which can clog spaces between the gravel and prevent them from emerging. In Volume I, we described several measures of substrate composition that have been used to index this problem, and concluded that with 1984 and 1985 streambed conditions Lagunitas Creek can be expected to produce survival and emergence of about 59% of the eggs deposited as living fry into the stream.

Juvenile Rearing--Steelhead

Following emergence, fry take up residence along the margin of the stream where they use space behind and under gravel and cobble as a refuge from high current velocity, predators, and as a station from which to feed on drifting insects. They grow rapidly, move out into faster water, and begin using cobbles and boulders as refuges and feeding stations. In Volume I of this report and in Kelley and Dettman (1980), we reported on the importance of substrate conditions for rearing juvenile steelhead. The amount of cobble larger than 45 mm and the degree to which this cobble is embedded in sand are good indexes of the capacity of the stream to rear juvenile steelhead through the end of their first summer. Habitat with cobble embeddedness of 50% rears only half as many fish as habitat with the cobble embeddedness of 25% and only one-quarter as many fish as habitat with cobble embeddedness of 13%.

Juvenile Rearing--Salmon

In mixed populations of juvenile salmon and steelhead, salmon occupy pools where they defend feeding territories at the heads of the pools. We did not study the relationships between sediment, streamflow, and salmon rearing habitat in Lagunitas Creek. However, based on the work of others, we believe the number of salmon that can be reared in pools is probably a function of pool volume, streamflow, and the area of riffles upstream which produce food. Excessive accumulation of sediment probably limits salmon rearing habitat by reducing the volume of pools and the amount of food produced in riffles upstream of pools.

DEVELOPMENT OF STREAMBED STANDARDS

There is no preproject historical record of substrate conditions in Lagunitas Creek on which we could empirically base standards. When Kelley and Dettman first measured cobble embeddedness in Lagunitas Creek during summer and fall 1979, the stream had not cleansed itself of fine sediment for 4 years. Substrate conditions were probably poorer than average in 1979.

During 1980, 1981, and 1982 Hecht (1983) measured embeddedness in Lagunitas Creek. By summer 1981, the mean embeddedness between Cheda Ranch and Upper State Park had declined to 22% in riffles, 28% in glides, and 27% in pools. Based on this information, Hecht concluded that the streambed in 1981 represented a long-term "normal" condition.

Based on the surveys in 1979 and 1981, we developed a set of standards for streambed conditions in Lagunitas Creek (Table 9). The standards include criteria for: average height to which cobble are embedded in sand or soil, average percentage of the streambed area covered with cobble or large sized material, average area in glides covered with gravel, and average percent composition of sand or finer material in nests. Meeting these standards will provide good to excellent substrate conditions for salmonid spawning, egg incubation, and juvenile rearing.

Average Cobble Embeddedness

Considering the large detrimental effect of embedding cobble in sand, it seems reasonable to set goals for as low as can be achieved--levels below 10% in riffles and 20% in glides and pools would provide excellent habitat. We believe it is reasonable to base the maximum allowable level for average embeddedness on the conditions we observed in 1979. Cobble embeddedness can change rapidly with sediment movements. Levels higher than those measured by Hecht in 1981 should alert parties to define the cause and take some action. We recommend maximum allowable embeddedness of 25% in riffles and 30% in glides and pools.

Percentage of Streambed Area Covered with Cobble and Boulders

Another goal should be to maximize the percent of riffles and pool bottoms covered with cobble and to provide only moderate amounts in glides which need gravel for spawning. Levels of 80% in riffles and 40% in glides and pools would be a desirable level to achieve.

We believe it is reasonable to set the minimum allowable percentage of the streambed occupied by cobble at 50% in riffles, 23% in glides, and 19% in pools. These were the levels measured by Hecht in 1981.

Table 9. Proposed streambed standards for salmonids in Lagunitas Creek. Designed to provide good to excellent spawning, incubating, and rearing habitat in Lagunitas Creek.

Habitat Type	Average Percent Embeddedness of Cobble (>45 mm) ¹		Average Percentage of Streambed Area Covered by Cobble (>45 mm)		Area of Spawning Habitat in Glides (% of amount measured in 1984-1985)	Average Percent of Redd Material that is Sand and Fine Sediment <3 mm at end of incubation
	Maximum Allowable	1981 Level	Minimum Allowable (1981 level)	Goal	Minimum Allowable	Maximum Allowable
RIFFLE	25	22	50 ²	80		
POOL	30	27	23 ²	40		
GLIDE	30	28	19 ²	40	80	10
Flows at which measures should be made.						January - March when flows are low enough to obtain samples.
	4-8 cfs		4-8 cfs		10-16 cfs	

1 Percent embeddedness is the percent of the cobble's height that is embedded in sand.

2 Data from Hecht (1983) collected during 1981 to serve as baseline streambed conditions in Lagunitas Creek.

Area in Spawning Glides Covered with Gravel

The amount and quality of spawning habitat in Lagunitas Creek depends upon an appropriate combination of streamflow and substrate conditions. In Chapter 2, we recommended flows of 10 to 16 cfs as adequate for spawning. Implicit in this recommendation was an assumption that there would be enough appropriately sized gravel covered by those flows in the low water channel of Lagunitas Creek.

We suggest that the area of spawning habitat available at flows between 10 and 16 cfs not be allowed to decline more than 20% below the levels we found in 1984 and 1985.

Average Percent Composition of Fines in Nests

The percentage of fine sediment in incubating nests affects the survival of alevins as they try to swim up through their nests. Considering the importance of this phase of the life cycle for salmon and steelhead, percent fines in redds should be kept as low as possible. In 1984, the percentage of sand in salmon nests averaged 9%--a level associated with a survival rate from egg to swim-up fry of 59%.

We recommend a standard for the maximum allowable percentage of sand in salmon and steelhead nests at 10% at the end of the incubation season.

Annual Monitoring of Streambed Conditions

An annual monitoring program of streambed conditions will be needed to determine whether streambed standards in Lagunitas Creek are being met. We recommend that a series of monitoring sections be established in the reach between Cheda Ranch Creek and Shafter Bridge for this purpose. Substrate conditions at these stations must be measured when streamflows are within the ranges of the minimum flow schedule described in Table 1. The degree of cobble embeddedness should be measured in summer or fall, the area of spawning habitat in late fall or early winter, and the percent composition of redd material that is sand or fine sediment <3 mm in winter or spring after fry have emerged from the redds.

CHAPTER 5 - DISCUSSION AND RECOMMENDATIONS

Our investigations reported in Volume I have led us to identify the following major problems that we believe have controlled salmon and steelhead populations that use Lagunitas Creek as spawning and juvenile rearing habitat.

1. The storms needed to provide flows high enough to attract salmon into Lagunitas Creek and to provide passage over the shallow riffles to their spawning beds are often late.

2. The base flow between storms during the winter is sometimes too low to provide for consistently successful spawning and egg incubation of both salmon and steelhead.

3. When storms move in, they often raise flows high enough to scour embryos from the redds that have been built in the stream gravel.

4. Summer flows have historically been too low to provide enough juvenile rearing habitat.

5. Erosion in the watershed causes the deposition of sand that is very detrimental to juvenile rearing habitat and increases the ability of the storm flows to scour the redds away.

6. Estuarine water temperatures during the late spring emigration period are sometimes too warm for the juvenile salmonids to pass through.

7. Water temperature during summer months in the State Park and Tocaloma reaches is sometimes too warm for good growth of salmon and steelhead.

In addition, Barry Hecht has defined another.

8. Lagunitas Creek above Tocaloma was a degrading reach, i.e., the streambed was gradually eroding downward exposing more bedrock and providing less satisfactory fish habitat.

Our work has been to identify and define these problems and to develop solutions to the extent that solutions are possible. We believe that the raising of Kent Dam, its operation using the minimum flow rules described in Table 1 of Chapter 2, and implementation of an adequate sediment management plan to protect the streambed are the best available approaches to solving all of these problems, except for No. 6--the warm water in the Lagunitas Estuary. We have developed no solution for that problem nor have we been able to measure its significance.

RECOMMENDATIONS

We recommend that the following be done:

1. The new or enlarged Kent Reservoir along with the other reservoirs in the Lagunitas system be operated using the flow rules described in Tables 1 and 2 of Chapter 2. If the District should sell more than 34,000 acre-feet of water per year from the Lagunitas Creek basin, the additional amount should be added to reservoir storage when considering the reservoir levels upon which wet, normal, below normal, and dry year instream flow releases are based.
2. A sediment management plan to meet the streambed standards should be developed and implemented. Spawning gravels and larger cobble should be passed over, around, or through any sand trap built.
3. To protect salmonids, we recommend that all feasible efforts be made to keep water in Lagunitas Creek below 57°F when adult salmon or steelhead are spawning or when eggs are incubating in the streambed and below 65°F when juveniles are being reared there. Recording thermographs should be maintained in Lagunitas Creek below Kent Reservoir and at or near the SPTSP gage.
4. The District should work with the Department of Fish and Game to develop and implement a program to monitor the results of the recommended operation and the sediment management plan.
5. The Department of Fish and Game should conduct experiments to assess the mortality of juvenile salmon and steelhead emigrating from the rearing areas to Tomales Bay. The principal need for such a study is to assess the seriousness of the water temperature problem in the estuary. The most direct approach would be to mark, with coded wire tags, appropriate numbers of near smolt size juveniles and stock them (a) in the rearing areas, (b) immediately above the estuary, and (c) in Tomales Bay. The data obtained from returns of coded wire tags from the ocean and estuarine fisheries over a period of several years would provide the best and probably least expensive assessment of the problem. A sound experimental design is essential.
6. The salmon stock enhancement program developed by the Lagunitas Creek Citizens Advisory Committee and members of Trout Unlimited with cooperation from the District and the Department of Fish and Game should be continued. The idea of stocking large numbers of fry to saturate the juvenile rearing habitat of the stream in years when there are insufficient spawners or when scour eliminates large numbers of redds is sound. The improved flow regime and a good sediment management plan may in time

render such artificial propagation unnecessary. Meanwhile, it could play a key role in rebuilding the stocks.

7. The District should now attempt to negotiate an agreement with the California Department of Fish and Game on these matters and submit that agreement to the SWRCB for inclusion in the District's water-use permit.

CITATIONS

Bratovich, Paul M. and Don W. Kelley. 1988. Investigations of salmon and steelhead in Lagunitas Creek, Marin County, California. Volume I. Migration, spawning, embryo incubation and emergence, juvenile rearing, emigration. Prepared for the Marin Municipal Water District, Corte Madera, California. 187 pp.

Hecht, Barry. 1981. Substrate enhancement/sediment management study Lagunitas Creek, Marin County. Phase IIIa: Sediment transport and bed conditions, 1980-1981. H. Esmaili & Associates, Inc. Preliminary Draft, prepared for the Marin Municipal Water District, Corte Madera, California. November 1981.

Hecht, Barry. 1983. Substrate enhancement/sediment management study Lagunitas Creek, Marin County. Phase IIIb: Sediment transport and bed conditions, 1979-1982. HEA A Division of J. H. Kleinfelder & Associates. Prepared for the Marin Municipal Water District, Corte Madera, California April 1983.

Hecht, Barry and Robert Enkeboll. 1979. Substrate enhancement/sediment management study Lagunitas Creek, Marin County. Phase I: Sediment sources and control alternatives. H. Esmaili & Associates, Inc. Prepared for the Marin Municipal Water District, Corte Madera, California. October 1979.

Hecht, Barry, George Muehleck, and Robert Enkeboll. 1980. Substrate Enhancement/Sediment Management Study Lagunitas Creek, Marin County. Phase II: Sediment transport and substrate conditions 1979-1980. H. Esmaili & Associates, Inc. Prepared for the Marin Municipal Water District, Corte Madera, California. September 1980.

Kelley, D. W. and D. H. Dettman. 1980. Relationships between streamflow, rearing habitat, substrate conditions, and juvenile steelhead populations in Lagunitas Creek, Marin County, 1979. Prepared for the Marin Municipal Water District, Corte Madera, California. February 1980.

Li, S. K. 1981. Survey of the California freshwater shrimp Syncaris pacifica in Lagunitas Creek, Marin County, California, August 1981. D. W. Kelley & Associates. Prepared for the Marin Municipal Water District, Corte Madera, California. 15 pp.

Nelson, John O., J. D. Fritz, and William I. Wilson. 1987. The summer dam. Part III. Physical data. Report submitted to the US Army Corps of Engineers, San Francisco District, December 1, 1987.

CITATIONS (continued)

Smith, Gary E. 1986. Instream flow requirements, anadromous salmonids spawning and rearing, Lagunitas Creek, Marin County. California Department of Fish and Game, Stream Evaluation Report 86-2, April 1986. 35 pp + Appendix.

WATER YEAR=1971

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
2	6.0	6.0	143.9	40.2	23.0	14.0	14.0	11.4	10.0	6.0	6.0	6.0
3	6.0	6.0	70.0	38.3	21.9	14.0	14.0	10.9	10.0	6.0	6.0	6.0
4	6.0	6.0	910.7	34.4	20.9	14.0	14.0	10.4	10.0	6.0	6.0	6.0
5	6.0	6.0	437.9	34.4	19.9	14.0	14.0	10.0	10.0	6.0	6.0	6.0
6	6.0	6.0	184.8	32.9	18.9	14.0	14.0	10.0	10.0	6.0	6.0	6.0
7	6.0	6.0	79.4	31.3	18.0	13.9	14.0	10.0	10.0	6.0	6.0	6.0
8	6.0	6.0	44.9	29.8	17.2	13.8	14.0	10.0	10.0	6.0	6.0	6.0
9	6.0	6.0	52.6	28.4	16.4	13.7	14.0	10.0	10.0	6.0	6.0	6.0
10	6.0	6.0	48.5	27.5	15.6	13.6	14.0	10.0	10.0	6.0	6.0	6.0
11	6.0	6.0	44.6	24.1	14.9	13.6	14.0	10.0	10.0	6.0	6.0	6.0
12	6.0	6.0	41.1	22.5	14.2	13.5	14.0	10.0	10.0	6.0	6.0	6.0
13	6.0	6.0	38.1	20.9	14.0	13.4	14.0	10.0	10.0	6.0	6.0	6.0
14	6.0	6.0	35.7	19.2	14.0	13.3	17.7	10.0	10.0	6.0	6.0	6.0
15	6.0	6.0	32.9	17.6	14.0	13.2	16.9	10.0	9.9	6.0	6.0	6.0
16	6.0	6.0	30.4	16.0	14.0	13.1	16.1	10.0	6.0	6.0	6.0	6.0
17	6.0	6.0	27.4	14.4	14.0	13.0	17.4	10.0	6.0	6.0	6.0	6.0
18	6.0	6.0	25.0	12.8	13.5	12.9	16.7	10.0	6.0	6.0	6.0	6.0
19	6.0	6.0	22.5	11.2	14.9	12.8	15.9	10.0	6.0	6.0	6.0	6.0
20	6.0	6.0	20.0	9.6	13.4	12.7	15.2	10.0	6.0	6.0	6.0	6.0
21	6.0	6.0	17.5	8.0	13.3	12.6	14.5	10.0	6.0	6.0	6.0	6.0
22	6.0	6.0	15.0	6.4	13.2	12.5	14.0	10.0	6.0	6.0	6.0	6.0
23	6.0	6.0	12.5	4.8	12.1	12.4	14.0	10.0	6.0	6.0	6.0	6.0
24	6.0	6.0	10.0	3.2	11.0	12.3	14.0	10.0	6.0	6.0	6.0	6.0
25	6.0	6.0	7.5	1.6	10.0	12.3	14.0	10.0	6.0	6.0	6.0	6.0
26	6.0	6.0	5.0	0.0	9.0	12.2	14.0	10.0	6.0	6.0	6.0	6.0
27	6.0	6.0	2.5	-1.6	8.0	12.1	14.0	10.0	6.0	6.0	6.0	6.0
28	6.0	6.0	0.0	-3.2	7.0	12.0	14.0	10.0	6.0	6.0	6.0	6.0
29	6.0	6.0	-2.5	-4.8	6.0	11.9	14.0	10.0	6.0	6.0	6.0	6.0
30	6.0	6.0	-5.0	-6.4	5.0	11.8	14.0	10.0	6.0	6.0	6.0	6.0
31	6.0	6.0	-7.5	-8.0	4.0	11.7	14.0	10.0	6.0	6.0	6.0	6.0

WATER YEAR=1971

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.3	0.3	142.9	99.2	68.0	2.1	7.3	8.9	2.2	0.2	0.3	0.4
2	0.2	0.2	69.0	103.3	63.9	2.0	7.0	8.5	2.1	0.1	0.3	0.4
3	0.2	0.2	979.7	96.4	59.9	1.9	6.9	8.0	2.0	0.1	0.3	0.4
4	0.2	0.2	436.9	91.6	55.9	1.8	6.6	7.6	1.9	0.1	0.3	0.4
5	0.1	0.1	183.8	85.9	51.9	1.7	6.2	7.2	1.8	0.1	0.3	0.4
6	0.1	0.1	78.4	80.3	48.0	1.6	6.0	6.9	1.7	0.1	0.3	0.4
7	0.1	0.1	189.9	76.8	44.2	1.6	5.5	6.5	1.6	0.1	0.3	0.4
8	0.1	0.1	126.6	72.4	40.4	1.5	5.1	6.2	1.5	0.1	0.3	0.4
9	0.1	0.1	137.4	68.5	36.6	1.4	4.7	5.9	1.4	0.1	0.3	0.4
10	0.1	0.1	125.6	183.1	33.9	1.3	4.3	5.6	1.4	0.1	0.3	0.4
11	0.1	0.1	114.1	349.5	31.2	1.2	3.9	5.3	1.3	0.1	0.3	0.4
12	0.1	0.1	104.1	206.9	28.5	1.1	3.5	5.1	1.2	0.1	0.3	0.4
13	0.1	0.1	95.7	212.2	25.9	1.0	3.1	4.8	1.2	0.1	0.3	0.4
14	0.1	0.1	87.9	200.9	23.3	0.9	2.7	4.6	1.1	0.1	0.3	0.4
15	0.1	0.1	80.4	218.7	20.7	0.8	2.3	4.3	1.1	0.1	0.3	0.4
16	0.1	0.1	73.4	285.7	18.1	0.7	1.9	4.1	1.0	0.1	0.3	0.4
17	0.1	0.1	66.9	266.6	16.6	0.6	1.5	3.9	1.0	0.1	0.3	0.4
18	0.1	0.1	60.4	143.0	15.3	0.5	1.1	3.7	0.9	0.1	0.3	0.4
19	0.1	0.1	53.9	137.4	14.0	0.4	0.8	3.5	0.9	0.1	0.3	0.4
20	0.1	0.1	47.4	131.0	12.7	0.3	0.6	3.4	0.8	0.1	0.3	0.4
21	0.1	0.1	40.9	124.7	11.4	0.2	0.4	3.2	0.8	0.1	0.3	0.4
22	0.1	0.1	34.4	118.5	10.1	0.1	0.3	3.0	0.7	0.1	0.3	0.4
23	0.1	0.1	27.9	112.4	8.8	0.0	0.2	2.9	0.7	0.1	0.3	0.4
24	0.1	0.1	21.4	106.5	7.5	0.0	0.1	2.7	0.7	0.1	0.3	0.4
25	0.1	0.1	14.9	100.6	6.2	0.0	0.0	2.6	0.6	0.1	0.3	0.4
26	0.1	0.1	8.4	94.8	5.0	0.0	0.0	2.5	0.6	0.1	0.3	0.4
27	0.1	0.1	1.9	89.0	3.7	0.0	0.0	2.3	0.5	0.1	0.3	0.4
28	0.1	0.1	-4.6	83.1	2.4	0.0	0.0	2.2	0.4	0.1	0.3	0.4
29	0.1	0.1	-11.1	77.2	1.1	0.0	0.0	2.1	0.3	0.1	0.3	0.4
30	0.1	0.1	-17.6	71.3	0.0	0.0	0.0	2.0	0.2	0.1	0.3	0.4
31	0.1	0.1	-24.1	65.4	-1.3	0.0	0.0	1.9	0.1	0.1	0.3	0.4

WATER YEAR=1971

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.9	0.9	440.1	120.7	67.8	6.5	22.5	27.4	6.8	0.6	0.9	1.2
2	0.6	0.6	212.5	114.9	64.4	6.2	21.6	26.2	6.5	0.5	0.9	1.2
3	0.6	0.6	195.6	1017.5	109.0	61.3	21.3	24.6	6.2	0.5	0.9	1.2
4	0.6	0.6	44.0	1345.7	103.5	58.2	20.3	23.4	5.9	0.5	0.9	1.2
5	0.3	0.3	366.1	98.3	55.1	5.8	19.1	22.2	5.5	0.5	0.9	1.2
6	0.3	0.3	32.0	241.5	52.4	4.9	17.7	21.3	5.2	0.5	0.9	1.2
7	0.3	0.3	16.3	135.2	49.9	4.9	16.2	20.0	4.9	0.5	0.9	1.2
8	0.3	0.3	8.3	158.9	47.4	4.9	14.7	19.1	4.6	0.5	0.9	1.2
9	0.3	0.3	1.1	146.0	45.0	4.9	13.2	18.2	4.3	0.5	0.9	1.2
10	0.3	0.3	5.9	134.3	42.8	4.9	11.7	17.2	4.0	0.5	0.9	1.2
11	0.3	0.3	5.9	123.3	40.7	4.9	10.2	16.3	3.7	0.5	0.9	1.2
12	0.3	0.3	4.9	114.3	38.5	4.9	9.7	15.4	3.4	0.5	0.9	1.2
13	0.3	0.3	4.0	106.9	36.7	4.9	9.1	14.5	3.1	0.5	0.9	1.2
14	0.3	0.3	3.4	98.3	34.8	4.9	8.6	13.6	2.8	0.5	0.9	1.2
15	0.3	0.3	2.8	90.7	32.9	4.9	8.1	12.7	2.5	0.5	0.9	1.2
16	0.3	0.3	2.3	83.1	31.1	4.9	7.6	11.8	2.2	0.5	0.9	1.2
17	0.3	0.3	1.8	75.5	29.2	4.9	7.1	10.9	1.9	0.5	0.9	1.2
18	0.3	0.3	1.3	67.9	27.3	4.9	6.6	10.0	1.6	0.5	0.9	1.2
19	0.3	0.3	0.8	60.3	25.4	4.9	6.1	9.1	1.3	0.5	0.9	1.2
20	0.3	0.3	0.3	52.7	23.5	4.9	5.6	8.2	1.0	0.5	0.9	1.2
21	0.3	0.3	0.0	45.1	21.6	4.9	5.1	7.3	0.7	0.5	0.9	1.2
22	0.3	0.3	-0.5	37.5	19.7	4.9	4.6	6.4	0.4	0.5	0.9	1.2
23	0.3	0.3	-1.0	29.9	17.8	4.9	4.1	5.5	0.1	0.5	0.9	1.2
24	0.3	0.3	-1.5	22.3	15.9	4.9	3.6	4.6	-0.2	0.5	0.9	1.2
25	0.3	0.3	-2.0	14.7	14.0	4.9	3.1	3.7	-0.5	0.5	0.9	1.2
26	0.3	0.3	-2.5	7.1	12.1	4.9	2.6	2.8	-0.8	0.5	0.9	1.2
27	0.3	0.3	-3.0	-0.5	10.2	4.9	2.1	1.9	-1.1	0.5	0.9	1.2
28	0.3	0.3	-3.5	-7.9	8.3	4.9	1.6	1.0	-1.4	0.5	0.9	1.2
29	0.3	0.3	-4.0	-15.3	6.4	4.9	1.1	0.1	-1.7	0.5	0.9	1.2
30	0.3	0.3	-4.5	-22.7	4.5	4.9	0.6	0.2	-2.0	0.5	0.9	1.2
31	0.3	0.3	-5.0	-30.1	2.6	4.9	0.1	0.3	-2.3	0.5	0.9	1.2

WATER YEAR=1972

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	6.0	14.0	13.4	11.5	6.0	6.0	4.0	4.0	4.0	4.0
2	6.0	6.0	6.0	14.0	10.6	10.9	6.0	6.0	4.0	4.0	4.0	4.0
3	6.0	6.0	6.0	14.0	11.9	10.3	6.0	6.0	4.0	4.0	4.0	4.0
4	6.0	6.0	6.0	15.0	22.7	10.0	6.0	6.0	4.0	4.0	4.0	4.0
5	6.0	6.0	6.0	15.0	279.8	10.0	6.0	6.0	4.0	4.0	4.0	4.0
6	6.0	6.0	6.0	14.0	154.9	10.0	6.1	6.0	4.0	4.0	4.0	4.0
7	6.0	6.0	6.0	14.0	63.2	10.0	7.3	6.0	4.0	4.0	4.0	4.0
8	6.0	6.0	6.0	14.0	54.7	10.0	6.9	6.0	4.0	4.0	4.0	4.0
9	6.0	6.0	6.0	14.0	47.4	10.0	6.6	6.0	4.0	4.0	4.0	4.0
10	6.0	6.0	6.0	14.0	41.2	11.2	6.3	6.0	4.0	4.0	4.0	4.0
11	6.0	6.0	6.0	14.0	35.7	10.5	8.7	6.0	4.0	4.0	4.0	4.0
12	6.0	6.0	232.7	14.0	31.0	10.0	12.4	6.0	4.0	4.0	4.0	4.0
13	6.0	29.3	50.2	14.0	27.0	10.0	20.3	6.0	4.0	4.0	4.0	4.0
14	6.0	13.3	39.0	14.0	23.4	10.0	18.8	3.9	4.0	4.0	4.0	4.0
15	6.0	6.4	17.3	13.9	20.4	10.0	17.4	3.9	4.0	4.0	4.0	4.0
16	6.0	6.0	14.0	13.7	17.8	10.0	16.1	3.9	4.0	4.0	4.0	4.0
17	6.0	6.0	14.0	13.5	15.5	10.0	14.9	3.9	4.0	4.0	4.0	4.0
18	6.0	6.0	14.0	13.3	13.3	10.0	13.8	3.9	4.0	4.0	4.0	4.0
19	6.0	6.0	14.0	13.2	11.8	10.0	12.8	3.9	4.0	4.0	4.0	4.0
20	6.0	6.0	14.0	13.1	10.5	10.0	11.9	3.9	4.0	4.0	4.0	4.0
21	6.0	6.0	14.0	13.1	10.4	10.0	11.0	6.0	4.0	4.0	4.0	4.0
22	6.0	6.0	42.8	14.0	10.0	12.4	10.2	3.9	4.0	4.0	4.0	4.0
23	6.0	6.0	39.2	21.2	10.0	11.7	9.5	3.9	4.0	4.0	4.0	4.0
24	6.0	6.0	23.8	19.1	10.0	11.0	11.8	6.0	4.0	4.0	4.0	4.0
25	6.0	6.0	94.8	48.5	10.0	10.5	11.0	3.9	4.0	4.0	4.0	4.0
26	6.0	6.0	31.2	38.2	10.0	10.0	10.2	3.9	4.0	4.0	4.0	4.0
27	6.0	6.0	71.4	67.6	10.0	10.0	9.5	6.0	4.0	4.0	4.0	8.3
28	6.0	6.0	22.7	32.9	10.0	10.0	8.9	3.9	4.0	4.0	4.0	7.9
29	6.0	6.0	16.4	41.2	10.0	10.0	8.3	6.0	4.0	4.0	4.0	7.6
30	6.0	6.0	14.0	32.1	10.0	10.0	7.8	3.9	4.0	4.0	4.0	7.2
31	6.0	6.0	14.0	23.0	10.0	10.0	6.0	6.0	3.7	4.0		

WATER YEAR=1972

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	0.3	0.7	10.3	12.4	10.5	2.6	4.1	1.6	0.2	0.1	0.1
2	0.9	0.3	3.1	9.2	9.6	9.9	2.4	3.9	1.5	0.1	0.1	0.1
3	0.9	0.2	2.6	8.1	10.9	9.3	2.3	3.7	1.4	0.1	0.1	0.1
4	0.9	0.2	2.4	7.2	26.7	8.7	2.1	3.5	1.3	0.1	0.1	0.1
5	0.9	0.1	2.0	6.4	272.8	8.1	2.1	3.3	1.3	0.1	0.1	0.1
6	0.9	0.1	1.6	5.7	153.9	7.6	2.1	3.2	1.2	0.1	0.1	0.1
7	0.9	0.1	1.4	5.0	62.2	7.1	4.5	3.0	1.1	0.1	0.1	0.1
8	0.9	0.1	1.2	4.5	53.7	6.6	5.9	2.9	1.1	0.1	0.1	0.1
9	0.9	0.1	1.1	4.0	46.4	6.1	5.6	2.7	1.0	0.1	0.1	0.1
10	0.9	0.1	1.0	3.5	40.2	10.2	5.3	2.6	1.0	0.1	0.1	0.1
11	0.9	1.1	2.9	3.1	34.7	9.5	7.7	2.4	0.9	0.1	0.1	0.1
12	0.9	7.3	231.7	2.8	30.0	8.9	11.4	2.3	0.9	0.1	0.1	0.1
13	0.9	78.3	49.2	2.4	26.0	8.3	19.3	2.2	0.8	0.1	0.1	0.1
14	0.9	12.3	28.5	2.2	22.4	7.8	17.8	2.1	0.3	0.1	0.1	0.1
15	0.9	5.6	16.5	1.9	19.4	7.3	16.4	2.0	0.2	0.1	0.1	0.1
16	0.9	4.4	9.6	1.7	16.8	6.8	15.1	1.9	0.7	0.1	0.1	0.1
17	0.9	3.6	5.6	1.5	14.5	6.4	13.9	1.8	0.7	0.1	0.1	0.1
18	0.9	3.0	4.8	1.3	12.5	6.0	12.8	1.7	0.7	0.1	0.1	0.1
19	0.9	2.4	4.1	1.2	10.8	5.6	11.8	1.6	0.6	0.1	0.1	0.1
20	0.9	2.0	3.5	1.1	9.5	5.2	10.9	1.5	0.6	0.1	0.1	0.1
21	0.9	1.6	3.0	1.1	9.4	4.9	10.0	1.5	0.6	0.1	0.1	0.1
22	0.9	1.3	41.8	7.0	6.2	11.4	9.2	1.4	0.5	0.1	0.1	0.1
23	0.9	1.1	52.2	20.2	8.1	10.7	8.5	1.3	0.5	0.1	0.1	0.1
24	0.9	0.9	24.8	12.1	7.7	10.0	10.8	1.3	0.5	0.1	0.1	0.1
25	0.9	0.7	93.8	47.5	7.1	9.5	10.0	1.2	0.5	0.1	0.1	7.3
26	0.9	0.6	30.2	37.2	6.6	8.9	9.2	1.1	0.4	0.1	0.1	6.9
27	0.9	0.5	70.4	66.6	6.1	8.3	8.5	1.1	0.4	0.1	0.1	6.2
28	0.9	2.3	21.7	51.9	5.7	7.8	7.9	1.0	0.4	0.1	0.1	0.1
29	0.9	1.9	15.4	46.2	8.8	7.3	7.3	1.0	0.4	0.1	0.1	0.1
30	0.9	1.6	10.9	31.1	6.9	6.8	6.8	0.9	0.4	0.1	0.1	0.1
31	0.9	7.7	24.0	6.5	0.9	0.9	0.9	0.9	0.1	0.1		

WATER YEAR=1972

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	0.9	2.2	31.7	38.2	32.3	8.0	12.6	4.9	0.6	0.3	0.3
2	2.8	0.9	9.5	28.3	29.6	30.5	7.4	12.0	4.6	0.3	0.3	0.3
3	2.8	0.6	8.0	24.9	33.6	28.6	7.1	11.4	4.3	0.3	0.3	0.3
4	2.8	0.6	7.4	22.2	82.2	26.8	6.5	10.8	4.0	0.3	0.3	0.3
5	2.8	0.3	6.2	19.7	858.7	24.9	6.5	10.2	4.0	0.3	0.3	0.3
6	2.8	0.3	4.9	17.6	474.0	23.4	21.9	9.9	3.7	0.3	0.3	0.3
7	2.8	0.3	4.3	15.4	191.6	21.9	20.0	9.2	3.4	0.3	0.3	0.3
8	2.8	0.3	3.7	13.9	165.4	20.3	18.2	8.9	3.4	0.3	0.3	0.3
9	2.8	0.3	3.2	12.3	142.8	18.8	17.2	8.3	3.1	0.3	0.3	0.3
10	2.8	0.3	10.8	10.8	123.8	31.4	16.3	8.0	3.1	0.3	0.3	0.3
11	2.8	3.4	8.9	9.3	106.9	29.3	23.7	7.4	2.8	0.3	0.3	0.3
12	2.8	22.5	713.6	8.6	92.4	27.4	33.1	7.1	2.8	0.3	0.3	0.3
13	2.8	87.2	151.3	7.4	80.1	25.6	39.4	6.8	2.5	0.3	0.3	0.3
14	2.8	37.9	87.8	6.8	69.0	24.0	54.8	6.5	2.5	0.3	0.3	0.3
15	2.8	16.6	50.8	5.9	59.8	22.5	50.3	6.2	2.5	0.3	0.3	0.3
16	2.8	10.6	29.6	5.2	51.7	20.9	46.5	5.9	2.2	0.3	0.3	0.3
17	2.8	11.1	17.2	4.6	44.7	19.7	42.8	5.5	2.2	0.3	0.3	0.3
18	2.8	9.2	14.8	4.0	38.5	18.5	39.4	5.2	2.2	0.3	0.3	0.3
19	2.8	7.4	12.6	3.7	33.3	17.2	36.3	4.9	1.8	0.3	0.3	0.3
20	2.8	6.2	10.8	3.4	29.3	16.0	33.6	4.6	1.8	0.3	0.3	0.3
21	2.8	4.9	9.2	3.4	29.0	15.1	30.8	4.6	1.8	0.3	0.3	0.3
22	2.8	4.0	128.7	21.6	27.1	35.1	28.3	4.3	1.5	0.3	0.3	0.3
23	2.8	3.4	179.3	62.2	24.9	33.0	26.2	4.0	1.5	0.3	0.3	0.3
24	2.8	2.8	76.4	55.7	23.7	30.8	33.3	4.0	1.5	0.3	0.3	0.3
25	2.8	2.2	288.9	146.3	21.9	29.3	30.8	3.7	1.5	0.3	0.3	22.3
26	2.8	1.8	93.0	114.6	20.3	27.4	28.3	3.4	1.2	0.3	0.3	21.3
27	2.8	1.5	216.8	205.1	18.8	25.6	26.2	3.4	1.2	0.3	0.3	19.1
28	2.8	7.1	66.8	159.9	17.6	24.0	24.3	3.1	1.2	0.3	0.3	0.3
29	2.8	5.9	47.4	123.8	27.1	22.5	22.5	3.1	1.2	0.3	0.3	0.3
30	2.8	4.9	33.6	95.8	21.3	20.9	20.9	2.8	1.2	0.3	0.3	0.3
31	2.8	23.7	73.9	20.0	20.0	20.0	2.8	2.8	0.3	0.3		

WATER YEAR=1978

ENLARGED KENT DAM-PLAN Z RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	1.3	16.3	56.6	43.9	80.2	65.4	12.7	10.0	6.0	6.0	6.0
2	1.9	1.3	14.6	53.1	41.7	76.2	62.1	12.1	10.0	6.0	6.0	6.0
3	1.7	1.3	13.1	55.6	39.7	72.5	59.1	11.5	10.0	6.0	6.0	6.0
4	1.6	1.3	11.8	51.3	37.8	68.9	56.2	11.0	10.0	6.0	6.0	6.0
5	1.5	1.3	10.7	61.1	35.9	73.3	53.4	10.5	10.0	6.0	6.0	6.0
6	1.4	1.3	9.6	89.5	34.2	69.8	50.8	10.0	10.0	6.0	6.0	6.0
7	1.3	1.3	8.7	39.9	32.5	66.3	121.3	10.0	10.0	6.0	6.0	6.0
8	1.3	1.3	7.8	37.3	31.0	83.6	113.9	10.0	10.0	6.0	6.0	6.0
9	1.2	1.3	7.1	318.2	132.8	133.0	107.7	10.0	10.0	6.0	6.0	6.0
10	1.2	1.3	6.4	144.3	126.2	126.4	100.6	10.0	10.0	5.9	6.0	6.0
11	1.2	1.3	5.9	65.7	120.0	120.1	94.5	10.0	10.0	6.0	6.0	6.0
12	1.1	1.3	5.3	63.5	342.9	114.2	88.6	10.0	10.0	6.0	6.0	6.0
13	1.1	1.3	4.9	69.6	234.0	108.5	82.8	10.0	10.0	6.0	6.0	6.0
14	1.1	1.3	4.5	443.1	124.3	103.2	77.0	10.0	10.0	6.0	6.0	6.0
15	1.1	1.3	4.1	314.3	119.3	98.1	72.4	10.0	10.0	6.0	6.0	6.0
16	1.1	1.3	3.8	261.6	113.4	93.2	66.8	10.0	6.0	6.0	6.0	6.0
17	1.0	1.3	87.4	171.6	107.9	88.6	62.3	10.0	6.0	6.0	6.0	6.0
18	1.0	1.3	75.7	85.0	102.5	84.2	57.9	10.0	6.0	5.9	6.0	6.0
19	1.0	1.3	65.6	186.2	97.5	80.1	53.6	10.0	6.0	6.0	6.0	6.0
20	1.0	1.3	56.8	92.4	92.6	76.1	49.3	10.0	6.0	6.0	6.0	6.0
21	1.0	1.3	50.3	46.1	88.0	72.4	45.1	10.0	6.0	6.0	6.0	6.0
22	1.0	353.3	377.4	43.8	83.7	68.8	40.9	10.0	6.0	6.0	6.0	6.0
23	1.0	115.6	192.2	41.7	79.6	65.4	36.8	10.0	6.0	6.0	6.0	6.0
24	1.0	84.3	63.7	39.6	75.6	62.2	33.8	10.0	6.0	6.0	6.0	6.0
25	1.0	61.6	57.9	37.7	71.7	59.1	30.8	10.0	6.0	6.0	6.0	6.0
26	1.0	43.0	52.7	35.9	68.4	56.2	27.9	10.0	6.0	6.0	6.0	6.0
27	1.0	33.0	122.3	34.1	65.0	53.3	25.0	10.0	6.0	5.9	6.0	6.0
28	1.0	24.3	57.4	32.5	61.8	50.8	22.1	10.0	6.0	6.0	6.0	6.0
29	1.0	21.8	99.3	30.9	48.3	48.3	19.3	10.0	6.0	6.0	6.0	6.0
30	1.0	19.5	92.9	29.4	46.0	46.0	17.6	10.0	6.0	6.0	6.0	6.0
31	1.0		85.7	28.0	43.7	43.7	10.0			6.0	6.0	

WATER YEAR=1978

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	0.3	15.3	55.6	42.9	229.2	182.4	17.7	3.6	0.6	0.6	4.7
2	0.9	0.3	13.6	52.1	40.7	217.2	173.1	14.1	3.5	0.6	0.6	4.5
3	0.7	0.3	12.1	54.6	38.7	205.5	164.1	12.5	3.3	0.5	0.6	4.2
4	0.6	0.3	10.8	50.3	36.8	193.9	155.2	11.0	3.1	0.5	0.6	4.0
5	0.5	0.3	9.7	60.1	34.9	207.3	146.4	9.5	3.0	0.5	0.6	3.8
6	0.4	0.3	8.6	88.5	33.2	196.8	137.8	9.0	2.8	0.5	0.6	3.6
7	0.3	0.3	7.7	36.9	31.5	186.3	130.3	8.6	2.7	0.4	0.6	3.5
8	0.3	0.3	6.8	36.3	30.0	239.6	122.9	8.2	2.5	0.6	0.6	3.3
9	0.2	0.3	6.1	317.2	131.8	392.0	116.7	7.8	2.4	0.4	0.6	3.1
10	0.2	0.3	5.4	141.3	125.2	376.4	110.6	7.4	2.3	0.4	0.6	3.1
11	0.2	0.3	4.9	64.7	119.0	361.1	104.5	7.0	2.2	0.3	0.6	3.0
12	0.1	0.3	4.3	62.5	341.9	346.2	98.6	6.6	2.1	0.3	0.6	2.8
13	0.1	0.3	3.9	68.6	233.0	331.5	92.8	6.3	2.0	0.3	0.6	2.7
14	0.1	0.3	3.5	442.1	123.3	317.2	87.0	6.0	1.9	0.3	0.6	2.5
15	0.1	0.3	3.1	313.3	118.3	303.1	81.4	5.7	1.8	0.3	0.6	2.4
16	0.1	0.3	2.8	280.6	112.4	289.2	75.8	5.4	1.7	0.3	0.6	2.3
17	0.0	0.3	2.6	170.6	106.9	275.5	71.3	5.1	1.6	0.3	0.6	2.2
18	0.0	0.3	2.4	84.0	101.5	262.2	66.9	4.9	1.5	0.2	0.6	2.1
19	0.0	0.2	2.2	64.6	185.2	249.1	62.6	4.6	1.4	0.2	0.6	2.0
20	0.0	0.3	2.0	55.8	91.4	236.1	58.3	4.4	1.3	0.2	0.6	1.9
21	0.0	0.3	1.9	45.3	87.6	223.4	54.1	4.2	1.2	0.2	0.6	1.8
22	0.0	352.3	176.4	42.3	82.7	210.8	50.9	4.0	1.2	0.2	0.6	1.7
23	0.0	114.6	151.2	40.7	234.6	199.4	47.8	3.8	1.2	0.2	0.6	1.6
24	0.0	83.3	62.7	38.6	240.6	188.2	44.8	3.6	1.1	0.2	0.6	1.6
25	0.0	60.6	56.9	36.7	227.6	177.1	41.8	3.4	1.1	0.2	0.6	1.6
26	0.0	46.0	51.7	34.9	215.4	166.2	38.9	3.2	1.0	0.2	0.6	1.6
27	0.0	32.0	121.3	33.1	204.0	155.5	36.0	3.1	1.0	0.2	0.6	1.6
28	0.0	23.1	56.4	31.5	193.8	143.8	33.1	2.9	0.9	0.1	0.6	1.6
29	0.0	20.8	58.3	29.9	183.3	133.3	30.3	2.8	0.9	0.1	0.6	1.6
30	0.0	18.5	51.9	28.4	173.0	123.0	26.6	2.6	0.8	0.1	0.6	1.6
31	0.0		44.7	27.0	114.7	114.7	2.5			0.1	0.6	

WATER YEAR=1978

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	0.9	47.1	171.2	132.1	243.9	198.4	36.0	11.1	1.8	1.8	14.5
2	2.8	0.9	41.9	160.5	125.4	231.6	188.2	34.2	10.8	1.8	1.8	13.9
3	2.2	0.9	37.3	168.2	119.2	220.2	178.9	32.3	10.2	1.5	1.8	12.9
4	1.8	0.9	33.3	154.9	113.3	209.1	170.0	30.8	9.5	1.5	1.8	12.3
5	1.5	0.9	29.9	185.1	107.5	222.7	161.4	29.3	9.2	1.5	1.8	11.7
6	1.2	0.9	26.5	272.6	102.3	211.9	153.4	27.7	8.6	1.5	1.8	11.1
7	0.9	0.9	23.7	119.8	97.0	201.1	145.7	26.5	8.3	1.2	1.8	10.8
8	0.9	0.9	20.9	111.8	92.4	254.4	138.3	25.3	7.7	1.2	1.8	10.2
9	0.6	0.9	18.8	977.0	403.9	406.6	131.5	24.0	7.4	1.2	1.8	9.5
10	0.6	0.9	16.6	441.4	383.6	386.2	123.0	22.8	7.1	1.2	1.8	9.3
11	0.6	0.9	15.1	199.3	366.5	366.8	118.6	21.6	6.8	0.9	1.8	9.2
12	0.3	0.9	13.2	192.5	1033.1	348.7	112.7	20.3	6.5	0.9	1.8	8.6
13	0.3	0.9	12.0	211.3	717.6	331.1	107.2	19.4	6.2	0.9	1.8	8.3
14	0.3	0.9	10.8	1361.7	379.8	314.8	101.6	18.5	5.9	0.9	1.8	7.7
15	0.3	0.9	9.5	965.0	364.4	299.1	96.7	17.6	5.5	0.9	1.8	7.4
16	0.3	0.9	8.6	802.6	346.2	284.0	91.8	16.6	5.2	0.9	1.8	7.1
17	0.0	0.9	266.1	523.4	329.3	269.8	87.2	15.7	4.9	0.9	1.8	6.8
18	0.0	0.9	230.1	258.7	312.6	256.3	82.9	15.1	4.6	0.6	1.8	6.5
19	0.0	0.9	199.0	570.4	297.2	243.6	78.8	14.2	4.3	0.6	1.8	6.2
20	0.0	0.9	171.9	281.5	282.1	231.3	74.8	13.6	4.0	0.6	1.8	5.9
21	0.0	0.9	151.8	138.9	268.0	219.9	71.1	12.9	4.0	0.6	1.8	5.5
22	0.0	1085.1	943.3	131.8	254.7	208.8	67.5	12.3	3.7	0.6	1.8	5.2
23	0.0	353.0	465.7	125.4	242.1	198.4	64.1	11.7	3.7	0.6	1.8	4.9
24	0.0	256.6	193.1	118.9	229.8	188.5	61.0	11.1	3.4	0.6	1.8	4.9
25	0.0	188.6	175.3	113.0	218.4	178.9	57.9	10.5	3.4	0.6	1.8	4.9
26	0.0	135.3	159.2	107.5	207.6	170.0	53.1	9.9	3.1	0.6	1.8	4.9
27	0.0	98.6	373.6	101.9	197.1	161.7	52.4	9.5	3.1	0.6	1.8	4.9
28	0.0	71.8	173.7	97.0	187.3	153.4	49.6	8.9	2.8	0.3	1.8	4.9
29	0.0	64.1	302.8	92.1	145.7	145.7	47.1	8.6	2.8	0.3	1.8	4.9
30	0.0	57.0	283.1	87.5	138.6	138.6	45.0	8.0	2.5	0.3	1.8	4.9
31	0.0		260.9	83.2	131.5	131.5	7.7			0.3	1.8	

WATER YEAR=1979

ENLARGED KENT DAM-PLAN. 1 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.0	14.0	12.3	15.9	122.8	18.7	11.0	5.0	5.0	5.1	5.4
2	6.0	6.0	14.0	12.4	14.4	31.3	17.2	10.3	5.0	5.0	5.0	5.2
3	6.0	6.0	14.0	12.4	12.9	49.0	15.9	10.0	5.0	5.0	5.0	5.0
4	6.0	6.0	14.0	12.3	12.0	44.6	14.6	9.6	5.0	5.0	5.0	5.0
5	6.0	6.0	14.0	12.2	12.0	40.6	13.3	12.2	5.0	5.0	5.0	5.0
6	6.0	6.0	13.8	12.2	12.0	37.0	14.8	12.7	5.0	5.0	5.0	5.0
7	6.0	6.0	13.8	12.2	12.0	33.7	13.7	12.1	5.0	5.0	5.0	5.0
8	6.0	6.0	13.2	14.0	12.0	30.6	12.6	11.3	5.0	4.9	5.0	5.0
9	6.0	6.0	13.0	99.6	12.0	27.9	12.0	11.0	5.0	5.0	5.0	5.0
10	6.0	6.0	12.8	34.0	12.0	23.4	11.5	10.3	5.0	5.0	5.0	5.0
11	6.0	6.0	12.7	598.7	12.0	23.2	11.0	10.0	5.0	5.0	5.0	5.0
12	6.0	6.0	12.6	183.6	12.0	21.1	10.3	9.6	5.0	4.9	5.0	5.0
13	6.0	6.0	12.6	46.7	33.3	19.3	10.0	9.1	5.0	5.0	5.0	5.0
14	6.0	6.0	12.6	234.6	126.9	17.6	9.3	8.7	5.0	4.9	5.0	5.0
15	6.0	6.0	12.6	134.1	99.6	16.6	9.1	8.4	5.0	5.0	5.0	5.0
16	6.0	6.0	12.6	40.6	161.0	21.3	8.7	8.0	5.0	5.0	5.0	5.0
17	6.0	6.0	12.6	28.2	62.3	19.3	8.3	8.0	5.0	4.9	5.0	5.0
18	6.0	6.0	14.0	26.3	74.3	17.8	8.0	8.0	5.0	5.0	5.0	5.0
19	6.0	6.0	14.0	18.6	62.3	16.8	8.0	8.0	5.0	5.0	5.0	5.0
20	6.0	53.0	14.0	14.0	39.3	13.9	8.0	8.0	5.0	4.9	5.0	5.0
21	6.0	35.0	14.0	14.0	213.1	13.0	8.0	8.0	5.0	5.0	5.0	5.0
22	6.0	35.0	14.0	14.0	107.6	14.2	8.0	8.0	5.0	5.0	5.0	5.0
23	6.0	14.0	13.6	14.0	122.8	13.4	8.0	8.0	5.0	5.0	5.0	5.0
24	6.0	14.0	13.4	14.0	107.8	12.7	8.0	8.0	5.0	5.0	5.0	5.0
25	6.0	14.0	13.2	14.0	94.6	12.0	8.0	8.0	5.0	5.0	5.0	5.0
26	6.0	14.0	13.0	14.0	135.0	11.4	8.0	8.0	5.0	5.0	5.0	5.0
27	6.0	14.0	12.8	14.0	121.9	34.0	8.0	8.0	5.0	5.0	5.0	5.0
28	6.0	14.0	12.7	14.0	110.1	31.7	8.0	8.0	5.0	5.0	5.0	5.0
29	6.0	14.0	12.6	14.0		29.8	8.0	8.0	5.0	5.0	5.0	5.0
30	6.0	13.8	12.6	14.0		26.8	8.0	8.0	5.0	5.0	5.0	5.0
31	6.0		12.6	16.3		24.7		8.0		5.0	5.0	

WATER YEAR=1979

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	0.3	4.8	0.5	14.9	121.8	24.7	10.0	3.1	1.5	4.1	4.4
2	1.1	0.3	4.0	0.4	13.4	50.3	21.2	9.3	2.9	1.4	3.9	4.2
3	0.9	0.3	3.3	0.4	11.9	48.0	18.9	9.0	2.8	1.4	3.7	4.0
4	0.7	0.3	2.7	0.3	10.6	43.6	16.6	8.6	2.6	1.3	3.5	3.8
5	0.6	0.3	2.2	0.2	9.5	39.6	13.3	11.2	2.5	1.2	3.4	3.6
6	0.5	0.3	1.8	0.2	8.4	36.0	14.8	11.7	2.4	1.2	3.2	3.4
7	0.4	0.3	1.5	0.2	7.3	32.7	12.7	11.1	2.3	1.1	3.0	3.2
8	0.3	0.3	1.2	10.4	6.7	29.6	11.6	10.5	2.1	1.0	2.9	3.1
9	0.3	0.3	1.0	98.6	5.9	26.9	11.0	10.0	2.0	0.9	2.7	2.9
10	0.3	0.3	0.8	53.0	5.3	42.4	10.3	9.3	1.9	0.9	2.6	2.8
11	0.3	0.3	0.7	597.7	4.7	37.2	10.0	9.0	1.8	0.9	2.5	2.6
12	0.3	0.3	0.6	184.6	4.2	32.1	9.5	8.6	1.7	0.8	2.3	2.5
13	0.3	1.2	0.6	45.7	3.5	27.3	9.0	8.1	1.7	0.8	2.2	2.4
14	0.3	0.9	0.6	253.6	125.9	22.6	8.5	7.7	1.6	0.7	2.1	2.3
15	0.3	0.8	0.6	133.1	98.6	23.6	8.1	7.4	1.5	0.7	2.0	2.1
16	0.3	0.6	0.6	39.6	160.0	28.3	7.7	7.0	1.4	0.7	1.9	2.0
17	0.3	0.5	0.6	27.2	61.3	24.5	7.3	6.6	1.4	0.6	1.9	1.8
18	0.3	0.4	0.6	25.3	73.3	21.8	7.0	6.3	1.3	0.6	1.9	1.7
19	0.3	2.9	3.8	17.6	61.5	19.8	6.6	6.0	1.2	0.6	1.9	1.7
20	0.3	54.0	3.1	12.2	58.5	16.9	6.3	5.7	1.2	0.5	1.9	1.6
21	0.3	22.3	2.6	10.8	214.1	15.0	6.0	5.4	1.1	0.5	1.9	1.5
22	0.3	9.2	2.1	9.3	106.6	13.2	5.7	5.1	1.0	0.5	1.9	1.5
23	0.3	7.5	1.8	8.4	121.8	12.4	5.4	4.9	1.0	0.5	1.9	1.4
24	0.3	6.2	1.4	7.4	106.8	11.7	5.1	4.6	0.9	0.5	1.9	1.4
25	0.3	5.0	1.2	6.6	93.6	11.0	4.9	4.4	0.9	0.5	1.9	1.3
26	0.3	4.1	1.0	5.8	134.0	10.4	4.6	4.2	0.9	0.5	1.9	1.3
27	0.3	3.4	0.8	5.1	120.9	9.5	4.8	4.0	0.8	0.5	1.9	1.2
28	0.3	2.8	0.7	4.5	109.1	8.7	4.6	3.8	0.8	0.5	1.9	1.2
29	0.3	2.3	0.6	4.0		7.8	4.4	3.6	0.7	0.5	1.9	1.1
30	0.3	1.8	0.6	3.6		6.8	4.1	3.4	0.7	0.5	1.9	1.0
31	0.3		0.6	15.3		23.7		3.2		0.5	1.9	

WATER YEAR=1979

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	0.9	14.8	1.5	45.9	375.1	54.3	30.8	9.3	4.6	12.6	13.6
2	3.4	0.9	12.3	1.2	41.3	153.3	49.9	29.3	8.9	4.3	12.0	12.9
3	2.8	0.9	10.2	1.2	36.7	147.8	45.9	27.7	8.6	4.3	11.4	12.3
4	2.2	0.9	8.3	0.9	32.6	134.3	41.9	26.3	8.0	4.0	10.8	11.7
5	1.8	0.9	6.8	0.6	29.3	122.0	38.3	24.3	7.7	3.7	10.3	11.1
6	1.5	0.9	5.5	0.6	25.9	110.9	42.3	26.0	7.4	3.7	9.9	10.3
7	1.2	0.9	4.6	0.6	23.1	100.7	39.1	24.2	7.1	3.4	9.9	9.9
8	0.9	0.9	3.7	0.6	20.6	91.2	35.7	32.3	6.3	3.1	8.9	9.3
9	0.9	0.9	3.1	303.7	18.2	82.9	33.9	30.8	6.2	2.8	8.3	8.9
10	0.9	0.9	2.5	163.2	16.3	75.2	32.3	29.3	5.9	2.8	8.0	8.6
11	0.9	0.9	2.2	1840.9	14.3	68.4	30.8	27.7	5.3	2.8	7.1	8.0
12	0.9	0.9	1.8	368.6	12.9	61.9	29.3	26.3	5.2	2.5	7.1	7.7
13	0.9	3.7	1.8	140.8	167.9	56.4	27.7	24.9	5.2	2.3	6.5	7.4
14	0.9	2.8	1.8	781.1	187.8	51.1	26.2	23.7	4.9	2.2	6.3	7.2
15	0.9	2.5	1.8	409.9	303.7	48.0	24.9	22.8	4.6	2.2	6.2	6.5
16	0.9	1.8	1.8	122.0	492.8	62.5	23.7	21.6	4.3	2.2	5.9	6.2
17	0.9	1.3	1.8	83.8	188.8	37.0	22.3	20.3	4.3	1.8	5.9	5.9
18	0.9	1.2	1.2	77.9	223.8	31.7	21.6	19.4	4.0	1.8	5.9	5.3
19	0.9	8.9	1.7	54.2	189.4	48.7	20.3	18.5	3.7	1.8	5.9	5.2
20	0.9	166.3	9.5	37.6	180.2	45.9	19.4	17.6	3.7	1.5	5.9	5.2
21	0.9	68.7	8.0	33.3	637.4	43.1	18.3	16.6	3.4	1.5	5.9	4.9
22	0.9	28.3	6.5	29.3	328.3	40.7	17.6	15.7	3.1	1.5	5.9	4.6
23	0.9	23.1	5.5	25.9	375.1	38.2	16.6	15.1	3.1	1.5	5.9	4.3
24	0.9	19.1	4.3	22.8	328.9	36.0	15.7	14.2	2.8	1.5	5.9	4.3
25	0.9	13.4	3.7	20.3	288.3	33.9	15.1	13.6	2.8	1.5	5.9	4.0
26	0.9	12.6	3.1	17.9	412.7	32.0	14.2	12.9	2.8	1.5	5.9	7.7
27	0.9	10.3	2.5	15.7	372.4	101.6	14.6	12.3	2.3	1.5	5.9	7.4
28	0.9	8.6	2.2	13.9	326.0	94.6	14.2	11.7	2.3	1.5	5.9	7.1
29	0.9	7.1	1.8	12.3		86.9	13.6	11.1	2.2	1.5	5.9	6.5
30	0.9	5.3	1.8	11.1		79.3	12.6	10.3	2.2	1.5	5.9	6.2
31	0.9		1.8	47.1		73.0		9.9		1.5	5.9	

WATER YEAR=1980

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	5.0	12.0	25.7	42.3	32.5	15.0	10.0	10.0	6.0	6.0	6.0
2	5.0	5.0	12.0	68.3	38.6	32.6	14.0	10.0	10.0	6.0	6.0	6.0
3	5.0	52.3	12.0	51.4	35.2	31.3	14.0	10.0	10.0	6.0	6.0	6.0
4	5.0	35.0	12.0	38.8	32.1	37.7	14.0	10.0	10.0	6.0	6.0	6.0
5	5.0	35.0	12.0	29.4	29.4	63.6	22.5	10.0	10.0	6.0	6.0	6.0
6	5.0	12.0	12.0	22.4	26.8	61.1	21.4	10.0	10.0	6.0	6.0	6.0
7	5.0	118.1	12.0	17.0	24.5	58.1	20.4	10.0	10.0	6.0	6.0	6.0
8	5.0	22.0	12.0	15.4	23.1	55.3	19.5	10.0	10.0	6.0	6.0	6.0
9	5.0	32.9	12.0	14.9	21.8	52.7	18.8	10.0	10.0	6.0	6.0	6.0
10	5.0	17.7	11.3	36.7	20.6	50.2	17.9	10.0	10.0	6.0	6.0	6.0
11	5.0	15.0	11.3	145.2	19.4	47.7	17.1	10.0	10.0	6.0	6.0	6.0
12	5.0	12.0	11.3	840.3	18.3	45.4	16.3	10.0	10.0	6.0	6.0	6.0
13	5.0	12.0	11.1	363.9	17.3	43.1	15.5	10.0	10.0	6.0	6.0	6.0
14	5.0	12.0	11.0	214.1	16.4	41.0	14.8	10.0	10.0	6.0	6.0	6.0
15	5.0	12.0	10.9	160.3	15.4	40.2	14.1	10.0	10.0	6.0	6.0	6.0
16	5.0	12.0	10.7	92.6	14.1	38.3	14.0	10.0	10.0	6.0	6.0	6.0
17	5.0	53.3	10.6	108.3	13.6	36.4	14.0	10.0	10.0	6.0	6.0	6.0
18	5.0	35.0	10.5	98.7	12.1	34.6	14.0	10.0	10.0	6.0	6.0	6.0
19	5.0	24.9	10.4	89.9	11.6	33.0	14.0	10.0	10.0	6.0	6.0	6.0
20	5.0	14.4	11.6	81.9	10.1	31.4	14.0	10.0	10.0	6.0	6.0	6.0
21	5.0	12.6	19.0	74.6	9.6	29.8	14.0	10.0	10.0	6.0	6.0	6.0
22	5.0	12.0	16.6	68.0	8.1	28.4	14.0	10.0	10.0	6.0	6.0	6.0
23	5.0	21.4	21.6	62.0	7.6	27.0	14.0	10.0	10.0	6.0	6.0	6.0
24	5.0	12.8	285.9	56.5	110.0	25.7	14.0	10.0	10.0	6.0	6.0	6.0
25	62.7	12.0	366.9	51.5	138.1	24.6	14.0	10.0	10.0	6.0	6.0	6.0
26	9.5	12.0	109.1	47.0	112.3	23.4	14.0	10.0	10.0	6.0	6.0	6.0
27	5.0	12.0	77.8	42.9	120.4	22.3	14.0	10.0	10.0	6.0	6.0	6.0
28	5.0	12.0	55.6	39.1	114.4	21.2	14.0	10.0	10.0	6.0	6.0	6.0
29	5.0	12.0	39.8	35.7	108.7	20.2	14.0	10.0	10.0	6.0	6.0	6.0
30	5.0	12.0	172.6	32.6	12.3	19.3	14.0	10.0	10.0	6.0	6.0	6.0
31	5.0		83.6	29.7		13.5	10.0	10.0	10.0	6.0	6.0	6.0

WATER YEAR=1980

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.3	2.0	7.0	67.3	108.6	82.6	7.4	7.4	4.7	2.2	1.3	3.3
2	0.3	1.7	6.0	50.4	97.2	81.3	7.1	7.0	4.5	2.1	1.3	3.1
3	0.2	51.3	5.1	37.8	87.1	101.7	6.8	6.7	4.3	2.0	1.2	3.0
4	0.2	25.0	4.4	28.4	78.4	123.6	22.5	6.3	4.1	1.9	1.2	2.8
5	0.1	12.3	3.8	21.4	69.8	179.1	50.4	6.0	3.8	1.8	1.1	2.7
6	0.1	10.3	3.2	16.0	62.5	167.1	46.4	5.7	3.7	1.7	1.0	2.6
7	0.1	117.1	2.6	14.4	56.1	158.3	43.5	5.4	3.5	1.6	1.0	2.4
8	0.1	61.0	2.4	13.9	51.8	149.7	40.8	5.2	3.3	1.6	0.9	2.3
9	0.1	31.9	2.0	35.7	47.6	142.2	37.9	4.9	3.1	1.5	0.9	2.2
10	0.1	16.7	1.8	144.2	43.4	133.7	35.1	4.7	3.0	1.4	0.9	2.1
11	0.1	14.0	1.5	839.3	40.3	126.4	33.3	4.4	2.8	1.3	0.8	2.0
12	0.1	11.8	1.3	364.9	37.3	119.1	31.5	4.2	2.7	1.3	0.8	1.9
13	0.1	10.0	1.1	213.1	34.4	113.0	29.8	4.0	2.6	1.2	0.7	1.8
14	0.1	8.4	1.0	159.3	37.4	107.2	18.1	3.8	2.4	1.1	0.7	1.7
15	0.1	7.1	0.8	97.6	73.1	104.3	13.4	3.6	2.3	1.1	0.7	1.6
16	0.1	5.9	0.7	107.3	164.5	98.4	11.8	3.4	2.2	1.0	0.6	1.5
17	0.1	52.3	0.6	97.7	414.1	92.6	11.2	3.3	2.1	1.0	0.6	1.5
18	0.1	29.0	0.5	88.9	1049.8	87.0	10.7	3.1	2.0	0.9	0.6	1.4
19	2.8	16.0	0.4	80.9	1356.6	82.4	10.1	2.9	1.9	0.9	0.6	1.3
20	2.3	13.6	1.6	243.6	901.6	76.8	9.9	2.8	1.8	0.8	0.6	1.2
21	1.9	11.6	18.0	220.0	1092.5	72.4	9.4	2.7	1.7	0.8	0.6	1.2
22	1.5	9.8	15.6	199.0	622.9	68.0	8.9	2.5	1.6	0.8	0.6	1.2
23	1.2	20.4	20.6	179.5	333.0	63.7	8.5	2.4	1.6	0.7	0.6	1.2
24	1.0	11.8	288.9	162.5	329.1	59.6	8.0	2.3	1.4	0.7	0.6	1.2
25	66.7	10.1	345.9	146.0	340.3	56.4	7.6	2.2	1.4	0.6	0.6	1.2
26	8.5	8.6	108.1	131.9	336.4	53.3	7.3	2.1	1.3	0.6	0.6	1.2
27	4.0	7.4	76.8	119.1	346.4	49.2	6.9	2.0	1.2	0.6	0.6	1.2
28	3.3	6.4	54.6	106.7	328.7	46.2	6.6	1.9	1.2	0.6	0.6	1.2
29	2.7	5.5	38.8	95.6	240.5	43.3	6.2	1.8	1.1	0.5	0.6	1.2
30	2.3	4.7	177.6	85.7	40.4	40.4	7.8	1.7	2.3	0.5	0.6	1.2
31	1.9		84.4	92.3		27.8		3.0		1.4	0.6	

WATER YEAR=1980

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.9	6.2	21.6	207.3	113.8	97.3	19.7	22.8	14.5	6.8	4.0	10.2
2	0.9	5.2	18.5	155.2	105.3	93.3	18.8	21.6	13.9	6.5	4.0	9.5
3	0.6	138.0	15.7	116.4	95.8	113.0	17.9	20.6	13.2	6.2	3.7	9.2
4	0.6	77.0	13.6	87.5	87.5	192.8	66.2	19.4	12.6	5.9	3.7	8.4
5	0.3	37.9	11.7	65.9	79.5	185.1	62.8	18.9	11.7	5.5	3.4	8.3
6	0.3	31.7	9.9	49.3	72.4	179.9	59.8	17.6	11.4	5.2	3.1	8.0
7	0.3	360.7	8.6	44.4	68.1	167.2	57.0	16.6	10.8	4.9	3.1	7.4
8	0.3	187.9	7.4	42.8	64.1	159.2	54.8	16.0	10.2	4.9	2.8	7.1
9	0.3	98.3	6.2	110.0	60.4	151.5	52.1	15.1	9.3	4.6	2.8	6.8
10	0.3	51.4	5.5	444.1	56.7	143.8	49.6	14.5	9.2	4.3	2.5	6.5
11	0.3	43.1	4.6	2585.0	53.3	136.8	47.1	13.6	8.6	4.0	2.5	6.2
12	0.3	36.3	4.0	1123.9	50.2	129.7	44.7	12.9	8.3	4.0	2.5	5.9
13	0.3	30.8	3.4	656.3	47.4	123.2	42.5	12.3	8.0	3.7	2.2	5.5
14	0.3	25.9	3.1	490.6	63.4	120.7	40.3	11.7	7.4	3.4	2.2	5.2
15	0.3	21.9	2.5	300.6	138.9	114.9	38.2	11.1	7.1	3.4	2.2	4.9
16	0.3	18.2	2.2	330.5	263.3	109.0	36.3	10.5	6.8	3.1	1.8	4.6
17	0.3	161.7	1.8	300.9	773.4	103.5	34.5	10.2	6.5	3.1	1.8	4.6
18	0.3	89.3	1.5	273.8	1671.8	98.6	33.0	9.5	6.2	2.8	1.8	4.3
19	8.6	49.3	1.2	249.2	747.2	93.6	31.1	8.9	5.9	2.8	1.8	4.0
20	7.1	41.9	4.9	226.7	1267.7	88.7	30.5	8.6	5.5	2.5	1.8	3.7
21	5.9	35.7	55.4	206.4	774.6	84.4	29.0	8.3	5.2	2.5	1.8	3.7
22	4.6	30.2	48.0	187.9	353.9	80.1	27.4	7.7	4.9	2.5	1.8	3.7
23	3.7	62.8	63.4	170.9	335.7	76.1	26.2	7.4	4.9	2.2	1.8	3.7
24	3.1	36.3	889.8	155.5	360.7	72.7	24.6	7.1	4.3	2.2	1.8	3.7
25	205.4	31.1	1065.4	141.7	342.8	69.0	23.4	6.8	4.3	1.8	1.8	3.7
26	26.2	26.5	332.9	129.1	367.8	65.4	22.5	6.5	4.0	1.8	1.8	3.7
27	12.3	22.8	236.5	117.3	349.3	62.2	21.3	6.2	3.7	1.8	1.8	3.7
28	10.2	19.7	168.2	106.9	331.7	59.1	20.3	5.9	3.7	1.8	1.8	3.7
29	8.3	16.9	119.5	97.3	321.0	56.4	19.1	5.5	3.4	1.5	1.8	3.7
30	7.1	14.5	547.0	88.4		53.6	24.0	5.2	7.1	1.5	1.8	3.7
31	5.9		260.0	127.2		20.9		5.4		4.3	1.8	

WATER YEAR=1981

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	8.2	6.0	12.3	28.3	10.0	21.2	6.0	3.3	5.3	4.6	4.0
2	6.3	6.7	6.0	12.3	18.4	10.0	18.1	6.0	3.0	5.0	4.3	4.0
3	6.0	6.0	6.2	12.3	16.3	10.0	13.4	6.0	4.7	4.7	4.0	4.0
4	3.9	6.0	56.3	12.3	14.3	22.7	13.2	6.0	4.4	4.4	4.0	4.0
5	6.0	6.0	35.0	12.3	12.6	16.5	12.2	6.0	4.2	4.2	4.0	4.0
6	6.0	6.0	35.0	12.3	11.1	14.8	11.3	6.0	4.0	4.0	4.0	4.0
7	6.0	6.0	14.0	12.3	10.0	13.3	10.5	6.0	4.0	4.0	4.0	4.0
8	6.0	6.0	14.0	12.3	10.0	11.9	9.8	6.0	4.0	4.0	4.0	4.0
9	6.0	6.0	14.0	12.3	16.1	10.7	9.1	6.0	4.0	4.0	4.0	4.0
10	6.0	6.0	14.0	12.3	14.2	10.0	8.4	6.0	4.0	4.0	4.0	4.0
11	6.0	6.0	13.9	12.3	14.3	10.0	7.8	6.0	4.0	4.0	4.0	4.0
12	6.0	6.0	13.6	12.3	12.6	23.2	7.3	6.0	4.0	4.0	4.0	4.0
13	6.0	6.0	13.3	12.3	11.8	17.2	6.8	6.0	4.0	4.0	4.0	4.0
14	6.0	6.0	13.1	12.3	14.4	15.4	6.3	6.0	4.0	4.0	4.0	4.0
15	6.0	6.0	12.9	12.3	12.8	32.5	6.0	6.0	4.0	4.0	4.0	4.0
16	6.0	6.0	12.7	12.3	11.3	24.3	6.0	6.0	4.0	4.0	4.0	4.0
17	6.0	6.0	12.6	12.3	10.1	18.5	6.0	6.0	4.0	4.0	4.0	4.0
18	6.0	6.0	12.5	12.3	10.0	39.3	6.0	6.0	4.0	4.0	4.0	4.0
19	6.0	6.0	12.4	12.3	10.0	48.2	6.3	6.0	4.0	4.0	4.0	4.0
20	6.0	6.0	12.3	17.2	10.0	366.9	6.2	6.0	4.0	4.0	4.0	4.0
21	6.0	6.0	12.3	16.4	10.0	144.1	6.3	6.0	4.0	4.0	4.0	4.0
22	6.0	6.0	12.2	33.1	10.0	37.0	6.2	6.0	4.0	4.0	4.0	4.0
23	6.0	6.0	12.2	83.7	10.0	46.6	6.3	6.0	4.0	4.0	4.0	4.0
24	6.0	6.0	12.2	43.7	10.0	38.1	6.2	6.0	4.0	4.0	4.0	4.0
25	6.0	6.0	12.1	25.4	10.0	142.2	6.1	6.0	4.0	4.0	4.0	4.0
26	6.0	6.0	12.1	14.5	10.0	58.5	6.0	6.0	4.0	4.0	4.0	4.0
27	6.0	6.0	12.1	261.5	10.0	49.4	6.0	6.0	4.0	4.0	4.0	4.0
28	6.0	6.0	12.1	115.3	10.0	41.8	6.0	6.0	4.0	4.0	4.0	4.0
29	6.0	6.0	12.1	211.1	35.4	6.0	6.0	6.0	4.0	4.0	4.0	4.0
30	6.0	6.0	12.1	36.0	30.7	6.0	6.0	6.0	4.0	4.0	4.0	4.0
31	6.0	6.0	12.1	36.3	23.6	6.0	6.0	6.0	4.0	4.0	4.0	4.0

WATER YEAR=1981

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	7.2	0.6	0.3	27.3	8.3	20.2	3.4	4.3	4.3	3.6	2.5
2	3.5	3.7	0.3	0.3	17.6	7.7	17.1	3.3	4.0	4.0	3.3	2.3
3	4.4	4.6	3.2	0.3	13.3	4.8	14.4	3.1	3.7	3.7	3.0	2.1
4	3.4	3.7	55.3	0.3	13.3	21.7	12.2	2.8	3.4	3.4	2.8	1.9
5	2.8	3.0	6.1	0.3	11.4	15.5	11.2	2.6	3.2	3.2	2.6	1.8
6	2.2	2.4	5.0	0.3	10.1	13.8	10.3	2.4	2.9	2.9	2.4	1.7
7	1.8	1.9	4.1	0.3	8.8	12.3	9.5	2.2	2.7	2.7	2.2	1.5
8	1.4	1.5	3.4	0.3	7.7	10.9	8.8	2.0	2.5	2.5	2.1	1.4
9	1.2	1.3	2.8	0.3	15.1	9.7	8.1	1.9	2.3	2.3	1.9	1.3
10	1.2	1.3	2.3	0.3	13.2	8.6	7.4	1.7	2.1	2.1	1.8	1.2
11	1.2	1.3	1.9	0.3	13.3	7.7	6.8	1.6	2.0	2.0	1.6	1.1
12	1.2	1.3	1.6	0.3	11.6	22.2	6.3	1.5	1.8	1.8	1.5	1.0
13	1.2	1.3	1.3	0.3	10.8	16.2	5.8	1.4	1.7	1.7	1.4	1.0
14	1.2	1.3	1.1	0.3	13.4	14.4	5.3	1.2	1.7	1.6	1.4	0.9
15	1.2	1.3	0.9	0.3	11.8	31.5	4.9	1.2	1.7	1.4	1.4	0.8
16	1.2	1.3	0.7	0.3	10.3	23.3	4.3	1.1	1.7	1.3	1.4	0.8
17	1.2	1.3	0.6	0.3	9.1	17.5	4.2	1.0	1.7	1.2	1.4	0.7
18	1.2	1.3	0.5	0.3	8.0	38.3	3.8	0.9	1.7	1.1	1.4	0.7
19	1.2	1.3	0.4	0.3	7.0	47.2	3.8	0.9	1.7	1.1	1.4	0.6
20	1.2	1.3	0.3	5.2	6.2	365.9	3.5	0.8	1.7	1.0	1.4	0.6
21	1.2	1.3	0.3	4.4	5.4	143.1	3.3	0.7	1.7	0.9	1.4	0.5
22	1.2	1.3	0.2	32.1	4.8	36.0	3.0	0.7	1.7	0.8	1.4	0.5
23	1.2	1.3	0.2	82.1	4.2	45.6	2.8	0.6	1.7	0.8	1.4	0.4
24	1.2	1.3	0.2	44.7	3.2	37.1	2.5	0.6	1.7	0.7	1.4	0.4
25	1.2	1.3	0.1	24.6	6.6	141.2	2.3	0.5	1.7	0.7	1.4	0.4
26	1.2	1.3	0.1	13.5	6.5	97.5	2.0	0.5	1.7	0.6	1.4	0.4
27	1.2	1.3	0.1	260.5	7.0	48.4	1.8	0.5	1.7	0.6	1.4	0.4
28	1.2	1.3	0.1	114.3	7.1	40.8	1.7	0.5	1.7	0.5	1.4	0.4
29	1.2	1.3	0.1	210.1	34.6	1.6	0.5	0.5	1.7	0.5	1.4	0.4
30	1.2	1.3	0.1	55.0	29.2	1.4	0.5	0.5	1.7	0.5	1.4	0.4
31	1.2	1.3	0.1	35.3	24.6	0.5	0.5	0.5	0.5	0.5	1.4	0.4

WATER YEAR=1981

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.9	22.2	1.8	0.9	84.1	25.6	62.2	11.1	13.2	13.2	11.1	7.7
2	16.9	17.4	1.3	0.9	54.2	23.7	52.7	10.2	12.3	12.3	10.2	7.1
3	13.6	14.2	16.0	0.9	47.1	20.9	44.4	9.5	11.4	11.4	9.2	6.5
4	10.5	11.4	170.3	0.9	41.0	66.8	37.6	8.6	10.5	10.5	8.6	5.9
5	8.6	9.2	18.8	0.9	35.7	47.7	34.5	8.0	9.9	9.9	8.0	5.5
6	6.8	7.4	15.4	0.9	31.1	42.5	31.7	7.4	8.9	8.9	7.4	5.2
7	5.5	5.9	12.6	0.9	27.1	37.9	29.3	6.8	8.3	8.3	6.8	4.6
8	4.3	4.6	10.5	0.9	23.7	33.6	27.1	6.2	7.7	7.7	6.5	4.3
9	3.7	4.6	8.6	0.9	46.5	29.9	24.9	5.9	7.1	7.1	5.9	4.0
10	3.7	4.6	7.1	0.9	40.7	26.5	22.8	5.2	6.5	6.5	5.5	3.7
11	3.7	4.6	5.9	0.9	41.0	23.7	20.9	4.9	6.2	6.2	4.9	3.4
12	3.7	4.6	4.9	0.9	35.7	68.4	19.4	4.6	5.3	5.3	4.6	3.1
13	3.7	4.6	4.0	0.9	33.3	49.9	17.9	4.3	5.2	5.2	4.3	3.1
14	3.7	4.6	3.4	0.9	41.3	44.4	16.3	3.7	5.2	4.9	4.3	2.8
15	3.7	4.6	2.8	0.9	36.3	97.0	15.1	3.7	5.2	4.3	4.3	2.5
16	3.7	4.6	2.2	0.9	31.7	72.4	13.9	3.4	5.2	4.0	4.3	2.5
17	3.7	4.6	1.8	0.9	28.0	53.9	12.9	3.1	5.2	3.7	4.3	2.2
18	3.7	4.6	1.5	0.9	24.6	118.0	11.7	2.8	5.2	3.4	4.3	2.2
19	3.7	4.6	1.2	0.9	21.6	143.4	11.7	2.8	5.2	3.4	4.3	1.8
20	3.7	4.6	0.9	16.0	19.1	1127.0	10.8	2.5	5.2	3.1	4.3	1.8
21	3.7	4.6	0.9	13.6	16.6	440.7	10.2	2.2	5.2	2.8	4.3	1.5
22	3.7	4.6	0.6	98.9	14.8	172.5	9.2	2.2	5.2	2.5	4.3	1.3
23	3.7	4.6	0.6	252.9	12.9	140.4	8.6	1.8	5.2	2.3	4.3	1.2
24	3.7	4.6	0.6	137.7	16.0	114.3	7.7	1.8	5.2	2.2	4.3	1.2
25	3.7	4.6	0.3	75.8	20.3	434.9	7.1	1.5	5.2	2.2	4.0	1.2
26	3.7	4.6	0.3	41.6	20.0	177.1	6.2	1.5	5.2	1.8	4.0	1.2
27	3.7	4.6	0.3	802.3	21.6	149.1	5.5	1.5	5.2	1.8	4.0	1.2
28	3.7	4.6	0.3	352.0	21.9	125.7	5.2	1.5	5.2	1.5	4.0	1.2
29	3.7	4.6	0.3	647.1	106.6	4.9	1.5	1.5	5.2	1.5	4.0	1.2
30	3.7	4.6	0.3	169.4	89.9	4.3	1.5	1.5	5.2	1.5	4.0	1.2
31	3.7	4.6	0.3	108.7	75.8	1.5	1.5	1.5	5.2	1.5	4.0	1.2

WATER YEAR=1982

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	9.6	19.9	171.4	284.2	300.0	171.3	13.7	12.0	8.0	8.0	8.8
2	4.8	8.1	13.6	90.8	270.6	384.4	176.1	13.0	12.0	8.0	8.0	8.5
3	4.0	6.8	12.1	84.0	257.2	176.3	461.5	12.4	12.0	8.0	8.0	8.1
4	4.0	5.7	10.7	1520.2	244.1	178.8	250.0	12.0	12.0	8.0	8.0	8.0
5	4.0	4.9	10.0	5321.7	231.1	182.4	236.6	12.0	12.0	8.0	8.0	8.0
6	4.0	4.2	10.0	4994.7	216.4	168.3	229.0	12.0	12.0	8.0	8.0	8.0
7	13.3	4.0	10.0	2393.9	201.8	161.3	215.9	12.0	12.0	8.0	8.0	8.0
8	10.9	4.0	10.0	1146.0	188.4	154.4	204.0	12.0	12.0	8.0	8.0	8.0
9	9.0	4.0	10.0	544.9	175.2	152.8	192.3	12.0	12.0	8.0	8.0	8.0
10	7.5	4.0	10.0	256.0	161.1	146.0	261.1	12.0	12.0	8.0	8.0	8.0
11	6.2	4.0	10.0	242.6	152.2	141.4	901.6	12.0	12.0	8.0	8.0	8.0
12	5.2	4.0	10.0	229.5	143.3	215.3	533.7	12.0	12.0	8.0	8.0	8.0
13	4.4	5.4	10.0	217.6	135.8	216.0	299.0	12.0	12.0	8.0	8.0	8.0
14	4.0	45.1	10.0	205.9	173.0	213.1	307.5	12.0	12.0	8.0	8.0	8.0
15	4.0	35.0	10.0	193.3	507.9	206.1	290.1	12.0	12.0	8.0	8.0	8.0
16	4.0	35.0	10.0	184.9	880.9	204.4	275.0	12.0	8.0	8.0	8.0	8.0
17	4.0	36.5	10.0	175.9	454.4	202.4	260.2	12.0	8.0	8.0	8.0	8.0
18	4.0	19.9	10.0	195.2	229.1	217.4	243.5	12.0	8.0	8.0	8.0	8.0
19	4.0	11.1	289.8	212.9	216.1	213.9	232.2	12.0	8.0	8.0	8.0	8.0
20	4.0	10.0	1461.8	218.9	204.3	202.2	219.0	12.0	8.0	8.0	8.0	8.0
21	4.0	35.3	997.3	207.2	193.6	191.6	207.1	12.0	8.0	8.0	8.0	8.0
22	4.0	73.1	244.3	196.6	183.2	181.1	195.3	12.0	8.0	8.0	8.0	8.0
23	4.0	42.4	100.3	186.3	173.0	170.9	184.7	12.0	8.0	8.0	8.0	8.0
24	4.0	187.3	90.4	176.1	162.9	160.8	174.4	12.0	8.0	8.0	8.0	8.0
25	4.0	45.8	81.5	207.2	153.9	151.8	164.1	12.0	8.0	8.0	8.0	8.0
26	4.0	213.7	73.5	196.8	145.1	144.1	154.1	12.0	8.0	8.0	8.0	8.0
27	4.0	58.4	74.3	376.2	201.3	137.7	144.2	12.0	8.0	8.0	8.0	8.0
28	4.0	41.6	67.1	219.2	190.7	131.1	135.4	12.0	8.0	8.0	8.0	8.0
29	16.7	32.6	197.5	208.5		127.3	126.8	12.0	8.0	8.0	8.0	8.0
30	13.8	27.1	279.1	196.9		127.5	119.3	12.0	8.0	8.0	8.0	8.0
31	11.5		118.7	186.5		129.4		12.0	8.0	8.0	8.0	8.0

WATER YEAR=1982

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	8.6	18.9	170.4	268.2	305.0	180.3	22.7	3.8	3.3	6.0	7.8
2	3.8	7.1	12.6	261.8	254.6	389.4	185.1	18.0	3.6	3.3	5.7	7.5
3	3.0	5.8	11.1	240.0	241.2	201.3	470.5	16.4	3.5	3.2	5.5	7.1
4	2.4	4.7	9.7	4664.2	229.1	190.8	259.0	14.9	3.3	3.0	5.2	6.7
5	1.9	3.9	8.5	10397	216.1	180.4	245.6	13.3	3.1	2.9	4.9	6.4
6	1.6	3.2	7.5	4992.7	205.4	170.3	234.0	11.8	3.0	2.7	4.7	6.1
7	12.3	2.6	6.9	2392.9	193.8	161.3	221.9	10.3	2.8	2.6	4.4	5.8
8	9.9	2.1	6.0	1143.0	183.4	152.4	211.0	8.8	2.7	2.5	4.2	5.5
9	8.0	1.7	5.3	541.9	173.2	159.8	201.3	8.4	2.5	2.3	4.0	5.2
10	6.5	1.4	6.5	253.0	164.1	151.0	370.1	8.0	2.4	2.2	3.8	4.9
11	5.2	1.2	5.7	239.6	153.2	146.4	910.6	7.6	2.3	2.1	3.6	4.7
12	4.2	1.0	5.3	226.5	146.5	220.5	944.7	7.2	2.2	2.0	3.4	4.5
13	3.4	4.4	5.7	214.6	138.8	222.0	308.0	6.8	2.1	1.9	3.3	4.2
14	2.8	44.1	6.4	202.9	176.0	210.1	316.5	6.5	2.0	1.8	3.1	4.0
15	2.2	22.1	6.4	192.3	510.9	213.1	299.1	6.2	1.9	1.7	2.9	3.8
16	1.8	16.6	5.7	181.9	883.9	201.4	284.0	5.9	1.8	1.6	2.8	3.6
17	1.5	35.5	5.0	172.9	457.4	220.4	269.2	5.6	1.7	1.5	2.7	3.5
18	1.5	18.9	4.5	192.2	233.1	226.4	254.5	5.3	1.6	1.5	2.5	3.3
19	1.5	10.1	288.8	209.9	219.1	218.9	241.2	5.0	1.5	1.4	2.5	3.1
20	1.5	8.5	1460.8	215.9	207.3	207.2	228.0	4.8	1.4	1.3	2.3	3.0
21	1.5	34.3	996.5	204.2	196.6	196.6	216.1	4.5	1.4	1.3	2.2	2.8
22	1.5	72.1	243.3	193.6	186.2	185.1	204.3	4.3	1.3	1.2	2.1	2.7
23	1.5	41.4	99.3	183.3	176.0	175.9	193.7	4.1	1.2	1.1	2.0	2.6
24	1.5	186.3	89.4	173.1	166.9	165.8	183.4	3.9	1.2	1.1	1.9	2.4
25	1.5	44.8	80.5	204.2	156.9	156.8	173.1	3.7	1.1	1.0	1.8	2.3
26	1.5	214.7	72.5	193.8	148.1	148.1	164.1	3.5	1.1	1.0	1.7	2.2
27	1.5	57.4	73.3	373.2	204.3	144.7	155.2	3.3	1.0	0.9	1.6	2.1
28	1.5	40.6	66.1	216.2	193.7	136.1	146.4	3.2	1.0	0.9	1.5	2.0
29	15.7	31.6	196.5	205.5		133.3	138.8	3.0	0.9	0.9	1.5	1.9
30	12.8	26.1	278.1	192.9		133.5	130.3	2.9	0.9	0.9	1.5	1.8
31	10.5		117.7	183.5		132.4		2.7	0.9	0.9	1.5	1.8

WATER YEAR=1982

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.5	26.3	58.2	524.8	284.0	320.3	195.0	39.1	11.7	10.8	18.5	24.0
2	11.7	21.9	38.8	276.6	269.8	404.7	200.5	37.0	11.1	10.2	17.6	23.1
3	9.2	17.9	34.3	255.6	256.3	216.5	483.1	35.1	10.8	9.9	16.9	21.9
4	7.4	14.5	29.9	4679.1	243.6	205.7	274.1	33.6	10.2	9.2	16.0	20.6
5	5.9	12.0	26.2	10412	231.3	195.3	260.6	31.2	9.5	8.9	15.1	19.7
6	4.9	9.9	23.1	3007.2	219.9	185.7	252.6	30.2	9.2	8.2	14.5	18.8
7	37.9	8.0	21.3	2408.3	208.8	176.5	239.9	28.6	8.6	8.0	13.6	17.9
8	30.5	6.5	18.5	1158.1	198.4	167.6	227.9	27.1	8.3	7.7	12.9	16.9
9	24.6	5.2	16.3	537.2	188.5	174.9	216.5	25.9	7.7	7.1	12.3	16.0
10	20.0	4.3	20.0	268.0	178.9	166.3	385.3	24.6	7.4	6.8	11.7	15.1
11	16.0	3.7	17.6	254.4	170.0	161.4	925.8	23.4	7.1	6.5	11.1	14.5
12	12.9	3.1	16.3	241.8	161.7	235.6	559.6	22.2	6.8	6.2	10.5	13.9
13	10.5	13.6	17.6	229.8	153.4	237.2	323.4	20.9	6.5	5.9	10.2	12.9
14	8.6	135.8	19.7	218.4	191.0	225.1	331.1	20.0	6.2	5.5	9.5	12.3
15	6.8	68.1	19.7	207.3	326.4	328.2	314.5	19.1	5.9	5.2	8.9	11.7
16	5.5	31.1	17.6	196.8	899.1	216.8	298.8	18.2	5.5	4.9	8.6	11.1
17	4.6	109.3	15.4	187.6	472.5	235.3	284.0	17.2	5.2	4.6	8.3	10.8
18	4.6	58.2	13.9	207.0	246.7	241.5	269.3	16.3	4.9	4.6	7.7	10.2
19	4.6	31.1	889.5	224.5	234.4	233.8	256.3	15.4	4.6	4.3	7.7	9.5
20	4.6	26.2	4499.3	230.7	222.7	222.4	243.3	14.8	4.3	4.0	7.1	9.2
21	4.6	105.6	1837.2	219.3	211.3	211.3	231.3	13.9	4.3	4.0	6.8	8.6
22	4.6	222.1	749.4	208.2	200.8	200.5	219.6	13.2	4.0	3.7	6.5	8.3
23	4.6	127.5	305.8	198.0	191.0	190.7	208.5	12.4	3.7	3.4	6.2	8.0
24	4.6	573.8	275.4	188.2	181.4	181.1	198.4	12.0	3.7	3.4	5.9	7.4
25	4.6	138.0	247.9	219.3	172.2	171.9	188.2	11.4	3.4	3.1	5.5	7.1
26	4.6	661.3	223.3	208.8	163.5	163.5	178.9	10.8	3.4	3.1	5.2	6.8
27	4.6	176.8	225.8	388.7	219.6	159.2	170.0	10.2	3.1	2.8	4.9	6.5
28	4.6	125.0	203.6	231.6	208.5	151.2	161.4	9.9	3.1	2.8	4.6	6.2
29	48.4	97.3	605.2	220.2		148.8	153.4	9.2	2.8	2.8	4.6	5.9
30	39.4	80.4	856.5	209.1		149.4	145.7	8.9	2.8	2.8	4.6	5.5
31	32.3		362.5	198.7		152.2		8.3		2.8	4.6	

WATER YEAR-1983

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	56.3	288.9	14.3	50.3	1710.3	161.2	99.8	12.0	8.0	8.0	8.0
2	8.0	25.7	81.1	14.0	37.2	1080.4	153.5	92.7	12.0	8.0	8.0	8.0
3	8.0	21.3	54.8	14.0	55.4	1068.3	144.6	83.7	12.0	8.0	8.0	8.0
4	8.0	17.7	36.8	14.0	51.3	696.7	135.9	74.8	12.0	8.2	8.0	8.0
5	8.0	14.8	24.9	14.0	119.7	489.3	128.3	71.0	12.0	8.2	8.0	8.0
6	8.0	12.3	16.9	14.0	668.2	264.1	119.8	78.6	12.0	8.2	8.0	8.0
7	8.0	10.3	13.0	14.0	800.8	499.6	113.5	72.8	12.0	8.2	8.0	8.0
8	8.0	8.7	14.0	14.0	869.0	256.8	106.2	68.1	12.0	8.2	8.0	8.0
9	8.0	7.3	14.0	14.0	384.6	246.4	99.1	63.4	12.0	8.2	8.0	8.0
10	8.0	6.2	14.0	14.0	362.3	234.8	93.1	58.8	12.0	8.2	8.0	8.1
11	8.0	6.0	14.0	14.0	341.8	223.0	87.2	54.3	12.0	8.2	8.0	8.0
12	8.0	6.0	14.0	14.0	971.0	527.9	81.4	49.9	12.0	8.1	8.0	8.0
13	8.0	6.0	14.0	14.0	490.1	363.6	75.7	45.6	12.0	8.2	8.0	8.1
14	8.0	6.0	14.0	14.0	218.1	2011.4	71.0	41.3	12.0	8.1	8.0	8.0
15	8.0	6.0	14.0	14.0	204.3	1102.6	65.5	38.1	12.0	8.2	8.0	8.1
16	8.0	6.0	14.0	14.0	307.7	600.6	62.0	34.9	8.0	8.1	8.0	8.0
17	8.0	6.0	15.9	14.0	291.3	508.5	57.6	31.8	8.0	8.1	8.0	8.0
18	8.0	173.0	14.1	14.0	498.6	327.8	53.3	28.8	8.0	8.2	8.0	8.0
19	8.0	94.1	14.0	63.7	226.3	174.1	49.0	25.8	8.0	8.1	8.0	8.0
20	8.0	32.0	14.0	33.5	214.3	163.2	45.8	21.9	8.0	8.1	8.0	8.0
21	8.0	28.9	73.9	44.9	202.6	196.3	42.7	19.0	8.0	8.1	8.0	8.0
22	8.0	24.7	457.2	189.1	191.0	434.0	39.6	17.1	8.0	8.1	8.0	8.0
23	8.0	46.4	206.2	77.1	913.2	238.2	53.1	16.3	8.0	8.1	8.0	8.0
24	8.0	24.6	73.6	292.2	423.4	305.2	51.5	15.5	8.0	8.0	8.0	8.0
25	8.0	22.8	59.0	158.0	1489.6	304.9	47.3	14.8	8.0	8.1	8.0	8.0
26	8.0	19.6	46.2	67.3	888.0	288.6	53.1	14.1	8.0	8.1	8.0	7.8
27	8.0	179.1	36.1	458.1	426.4	590.3	55.4	13.5	8.0	8.1	8.0	7.9
28	8.0	111.2	28.3	196.6	2323.3	331.2	52.1	12.8	8.0	8.1	8.0	7.9
29	8.0	308.6	22.3	103.9		181.6	49.8	12.3	8.0	8.0	8.0	8.0
30	116.1	634.2	20.2	45.3		177.2	82.7	12.0	8.0	8.1	8.0	8.0
31	32.3		18.4	41.9		198.2		12.0		8.0		

WATER YEAR-1983

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	33.3	287.9	26.3	167.3	1713.5	170.2	113.8	8.4	5.7	2.1	1.6
2	3.9	24.7	80.1	22.2	158.2	1085.4	162.5	107.7	8.0	5.4	2.0	1.5
3	3.1	20.3	53.8	19.1	132.4	1073.3	153.6	103.7	7.6	5.1	1.9	1.4
4	2.5	16.7	35.8	16.0	140.3	701.7	145.9	94.8	7.2	4.9	1.8	1.4
5	2.0	13.8	23.9	13.0	350.7	494.3	108.3	86.0	6.8	4.6	1.7	1.3
6	1.6	11.3	15.9	10.2	384.2	268.1	130.8	86.6	6.5	4.4	1.7	1.2
7	1.3	9.3	14.0	8.4	803.8	504.6	123.5	82.8	6.2	4.2	1.6	1.2
8	1.0	7.7	12.2	6.7	854.0	261.8	116.2	79.1	5.9	4.0	1.5	1.1
9	0.8	6.3	10.7	6.0	387.6	251.4	114.1	76.4	5.6	3.8	1.4	1.1
10	0.7	5.2	9.4	5.5	363.5	239.8	107.1	73.8	5.3	3.4	1.4	1.0
11	0.5	4.3	8.3	4.9	344.8	228.0	100.2	70.3	5.0	3.4	1.3	0.9
12	0.4	3.6	7.2	4.3	974.0	532.9	94.4	66.9	4.8	3.2	1.2	0.9
13	0.4	2.9	7.0	4.0	493.1	3658.6	89.7	63.6	4.5	3.1	1.2	0.9
14	0.4	2.4	6.2	3.7	219.1	2016.4	84.0	48.3	4.3	3.1	1.1	0.8
15	0.4	2.0	5.4	3.3	207.3	1107.6	78.3	34.1	4.1	2.8	1.0	0.7
16	0.4	1.7	4.7	3.0	310.7	605.6	73.0	30.9	3.9	2.6	1.0	0.7
17	0.4	1.4	4.9	2.7	294.5	513.5	67.6	28.8	3.7	2.5	0.9	0.7
18	0.4	172.0	13.1	2.4	501.6	332.8	63.3	26.8	3.5	2.4	0.9	0.7
19	0.4	93.1	11.6	62.7	229.3	179.1	59.0	23.8	3.3	2.2	0.9	0.7
20	0.4	51.0	11.3	146.5	217.3	173.2	54.8	21.9	3.2	2.1	0.8	0.7
21	0.4	27.9	74.9	119.9	205.6	201.3	51.7	20.0	3.0	2.0	0.8	0.7
22	0.4	23.7	456.2	364.1	194.0	444.0	49.6	18.1	2.9	1.9	0.7	0.7
23	0.4	43.4	205.2	219.1	916.2	247.2	53.1	16.3	2.7	1.8	0.7	0.7
24	0.4	25.6	74.6	882.2	426.4	543.2	61.5	14.5	2.6	1.7	0.7	0.7
25	0.4	21.8	177.0	469.0	1492.6	313.9	58.3	13.8	2.5	1.7	0.6	0.7
26	0.4	18.6	124.2	189.3	891.0	297.6	55.1	13.1	2.3	1.6	0.6	0.7
27	0.4	178.1	93.1	1393.1	429.4	599.3	57.4	12.5	2.2	1.5	0.6	0.7
28	0.4	110.2	69.3	387.6	2326.3	340.2	65.1	11.8	2.1	1.4	0.5	0.7
29	0.4	307.6	50.3	301.9		190.6	60.6	11.3	2.0	1.3	0.5	0.7
30	115.1	633.2	44.2	121.3		186.2	69.7	10.7	1.9	1.3	0.5	0.7
31	31.3		38.4	110.9		207.2		10.2		1.2	0.5	

WATER YEAR-1983

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.8	170.3	886.7	41.6	182.6	1729.4	185.4	128.7	25.9	17.6	6.5	4.9
2	12.0	76.1	246.7	37.6	173.1	1100.8	177.1	122.3	24.6	16.6	6.2	4.6
3	9.5	62.5	165.7	34.2	167.6	1088.2	168.2	116.1	23.4	15.7	5.9	4.3
4	7.7	51.4	110.3	30.8	154.9	716.7	159.9	110.3	22.2	15.1	5.5	4.0
5	6.2	42.5	73.6	27.7	365.6	509.1	151.8	104.7	20.9	14.2	5.2	3.7
6	4.9	34.8	49.0	25.3	607.6	283.7	144.1	112.7	20.0	13.6	5.2	3.7
7	4.0	28.6	43.1	22.8	818.7	519.3	137.1	107.2	19.1	12.9	4.9	3.7
8	3.1	23.7	37.6	20.6	868.6	276.6	130.0	101.9	18.2	12.3	4.6	3.4
9	2.5	19.4	33.0	18.5	402.2	266.1	123.5	96.7	17.2	11.7	4.3	3.1
10	2.2	16.0	29.0	16.9	380.4	255.0	117.3	91.8	16.3	11.5	4.2	2.8
11	1.3	13.2	25.6	15.1	359.7	243.3	111.5	87.2	15.4	10.9	3.9	2.8
12	1.2	11.1	22.2	13.9	988.7	347.9	106.0	82.9	14.8	9.9	3.7	2.6
13	1.2	8.9	21.6	12.3	508.5	3673.2	100.7	78.8	13.9	8.5	3.5	2.6
14	1.2	7.4	19.1	11.4	234.4	2031.0	95.5	74.8	13.2	8.4	3.4	2.5
15	1.2	6.2	16.6	10.2	222.7	1123.0	90.9	71.1	12.6	8.4	3.1	2.5
16	1.2	5.2	14.5	9.2	325.6	620.9	86.2	67.5	12.0	8.0	3.1	2.2
17	1.2	4.3	45.9	8.3	309.5	528.2	81.9	64.1	11.4	7.7	2.8	2.2
18	1.2	329.8	40.3	7.4	516.2	347.4	77.9	61.0	10.8	7.4	2.8	2.2
19	1.2	286.7	35.7	193.1	244.2	194.3	73.9	57.9	10.2	6.8	2.8	2.2
20	1.2	157.1	34.8	161.7	231.9	200.8	70.2	55.1	9.9	6.5	2.5	2.2
21	1.2	85.9	230.7	135.2	220.5	216.5	66.8	52.4	9.2	6.2	2.5	2.2
22	1.2	73.0	1405.1	579.3	209.4	458.9	63.4	49.6	8.9	5.9	2.2	2.2
23	1.2	139.8	632.0	234.4	930.8	262.4	77.3	47.1	8.3	5.5	2.2	2.2
24	1.2	78.8	229.8	896.9	441.7	558.1	73.5	44.7	8.0	5.2	2.2	2.2
25	1.2	67.1	178.6	483.6	1508.0	329.3	71.8	42.5	7.7	5.2	1.8	2.2
26	1.2	57.3	139.2	204.2	905.5	312.9	68.1	40.3	7.1	4.9	1.8	2.2
27	1.2	348.5	108.1	1407.9	444.8	613.8	81.3	38.3	6.8	4.6	1.8	2.2
28	1.2	339.4	84.1	602.4	2341.7	354.8	77.3	36.3	6.5	4.3	1.9	2.2
29	1.2	947.4	65.6	316.9		205.1	73.3	34.8	6.2	4.0	1.9	2.2
30	334.5	2011.9	59.1	136.4		200.8	106.9	33.0	5.9	4.0	1.9	2.2
31	158.0		53.6	126.0		222.4		31.4		3.7	1.9	

WATER YEAR-1984

ENLARGED KENT DAM-PLAN 7 RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	48.7	65.0	532.2	14.0	366.7	63.4	10.0	10.0	6.0	6.0	6.0
2	11.3	39.7	56.1	414.6	14.0	334.1	54.6	10.0	10.0	6.0	6.0	6.0
3	9.4	32.4	177.4	308.8	14.0	300.4	47.0	10.0	10.0	6.0	6.0	6.0
4	8.0	26.3	100.3	230.3	14.0	277.3	39.7	10.0	10.0	6.0	6.0	6.0
5	8.0	21.7	56.9	167.0	14.0	252.4	32.6	10.0	10.0	6.0	6.0	6.0
6	8.0	17.8	48.6	121.4	14.0	232.0	27.8	10.0	10.0	6.0	6.0	6.0
7	8.0	14.6	41.6	88.4	14.0	212.1	22.1	10.0	10.0	6.0	6.0	6.0
8	8.0	14.0	34.6	62.0	14.0	192.9	20.1	10.0	10.0	6.0	6.0	6.0
9	8.0	14.0	128.9	54.4	14.0	173.2	15.0	10.0	10.0	6.0	6.0	6.0
10	8.0	15.7	281.9	47.0	14.0	154.9	19.0	10.0	10.0	6.0	6.0	6.0
11	8.0	81.3	374.5	39.9	14.0	140.1	15.0	10.0	10.0	6.0	6.0	6.0
12	8.0	56.1	340.4	34.0	14.0	126.7	14.0	10.0	10.0	6.0	6.0	6.0
13	8.0	46.3	134.1	28.3	21.8	114.7	14.0	10.0	10.0	6.0	6.0	6.0
14	8.0	38.3	101.0	23.8	26.8	431.9	14.0	10.0	10.0	6.0	6.0	6.0
15	8.0	31.8	64.9	20.4	24.6	366.3	14.0	10.0	6.0	6.0	6.0	6.0
16	8.0	98.7	55.6	23.8	33.2	486.3	14.0	10.0	6.0	6.0	6.0	6.0
17	8.0	118.1	39.8	20.4	43.3	804.9	14.0	10.0	6.0	6.0	6.0	6.0
18	8.0	57.8	52.3	16.2	32.7	703.9	14.0	10.0	6.0	6.0	6.0	6.0
19	8.0	28.6	45.7	14.0	32.7	614.0	14.0	10.0	6.0	6.0	6.0	6.0
20	8.0	106.8	39.9	14.0	29.9	536.6	14.0	10.0	6.0	6.0	6.0	6.0
21	8.0	54.8	34.9	14.0	72.4	467.3	14.0	10.0	6.0	6.0	6.0	6.0
22	8.0	46.1	33.6	14.0	74.7	407.8	14.0	10.0	6.0	6.0	6.0	6.0
23	8.0	38.9	73.1	14.0	67.3	354.7	14.0	10.0	6.0	6.0	6.0	6.0
24	8.0	249.9	198.4	14.0	63.1	328.0	14.0	10.0	6.0	6.0	6.0	6.0
25	8.0	134.5	688.7	14.0	60.1	308.5	14.0	10.0	6.0	6.0	6.0	6.0
26	8.0	73.3	245.1	14.0	53.1	284.9	14.0	10.0	6.0	6.0	6.0	6.0
27	8.0	40.1	331.0	14.0	46.2	262.9	14.0	10.0	6.0	6.0	6.0	6.0
28	8.0	34.1	567.0	14.0	39.5	242.3	14.0	10.0	6.0	6.0	6.0	6.0
29	8.0	29.0	539.0	14.0	33.0	224.2	14.0	10.0	6.0	6.0	6.0	6.0
30	8.0	24.7	1147.3	14.0	206.6	14.0	10.0	6.0	6.0	6.0	6.0	6.0
31	26.7		869.2	14.0		190.3	10.0		6.0	6.0		

WATER YEAR-1984

SMALL KENT DAM-NO RELEASES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.0	47.7	65.0	349.2	6.7	371.7	72.4	4.7	2.6	1.4	0.6	0.3
2	10.3	38.7	55.1	411.6	6.1	339.1	63.4	4.9	2.3	1.3	0.6	0.3
3	8.4	31.4	176.4	307.8	5.3	309.4	56.0	4.6	2.3	1.2	0.6	0.3
4	6.7	25.3	99.3	229.3	4.9	282.3	48.7	4.4	2.2	1.1	0.5	0.2
5	5.4	20.7	33.9	170.0	4.3	257.4	42.6	4.1	2.1	1.1	0.5	0.2
6	4.4	16.8	47.6	124.4	4.0	234.0	37.8	3.9	2.0	1.0	0.5	0.2
7	4.4	13.6	40.6	90.4	3.6	213.1	33.1	3.6	1.9	1.0	0.5	0.2
8	4.4	11.0	33.6	65.0	3.3	193.9	31.1	3.4	1.8	0.9	0.4	0.2
9	4.4	9.0	127.9	57.4	2.9	176.2	26.3	3.2	1.7	0.9	0.4	0.2
10	4.4	14.7	280.9	50.0	2.8	159.9	26.0	3.0	1.6	0.8	0.4	0.2
11	4.4	80.3	373.3	42.9	2.5	145.1	22.6	2.8	1.5	0.8	0.4	0.2
12	4.4	55.1	239.4	37.0	3.5	131.7	19.4	2.7	1.4	0.7	0.3	0.2
13	4.4	45.3	456.1	32.3	20.8	119.7	16.3	2.5	1.3	0.7	0.3	0.2
14	4.4	37.3	293.0	27.8	25.8	437.9	13.3	2.4	1.2	0.6	0.3	0.2
15	4.4	30.8	181.9	24.4	23.6	371.3	10.4	2.2	1.2	0.6	0.3	0.2
16	4.4	93.7	156.6	24.8	32.2	491.5	8.6	2.1	1.1	0.6	0.3	0.2
17	4.4	117.1	165.8	20.4	119.3	809.9	6.9	2.0	1.0	0.5	0.3	0.2
18	4.4	56.8	143.3	17.2	91.7	708.9	6.4	1.9	1.0	0.5	0.3	0.2
19	4.4	27.6	122.7	14.1	72.7	619.0	6.2	1.7	0.9	0.5	0.3	0.2
20	4.4	105.8	104.9	11.1	73.9	541.6	5.8	1.6	0.9	0.5	0.3	0.2
21	4.4	53.8	89.9	9.4	81.4	472.3	5.4	1.5	0.8	0.4	0.3	0.2
22	4.4	43.1	89.6	7.6	73.7	412.8	5.1	1.3	0.8	0.4	0.3	0.2
23	4.4	37.9	207.1	6.9	66.3	359.7	4.8	1.4	0.7	0.4	0.3	0.2
24	4.4	248.9	593.4	6.2	63.1	333.0	4.5	1.3	0.7	0.4	0.3	0.2
25	4.4	133.5	2102.7	5.6	59.1	313.5	4.2	1.2	0.7	0.4	0.3	0.2
26	4.4	72.3	737.1	5.0	53.1	289.9	3.9	1.1	0.7	0.4	0.3	0.2
27	4.4	39.1	1001.0	4.5	47.2	267.9	3.7	1.1	0.7	0.4	0.3	0.2
28	4.4	33.1	733.0	4.1	41.5	247.3	3.5	1.0	0.7	0.4	0.3	0.2
29	4.4	28.0	536.0	3.7	37.0	229.2	3.3	0.9	0.7	0.4	0.3	0.2
30	4.4	23.7	1144.3	3.3	211.6	14.0	3.0	0.9	0.7	0.4	0.3	0.2
31	25.7		866.2	3.0		195.3	0.8		0.4	0.3		

WATER YEAR-1984

NATURAL FLOW-NO DAM

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40.0	146.9	200.2	364.3	20.6	387.2	87.5	14.5	8.0	4.3	1.8	0.9
2	32.3	119.2	169.7	426.9	18.8	354.5	78.8	15.1	7.7	4.0	1.8	0.9
3	25.9	96.7	343.3	352.8	16.9	324.6	70.8	14.2	7.1	3.7	1.8	0.9
4	20.6	78.5	305.8	244.2	15.1	297.2	63.8	13.6	6.8	3.4	1.5	0.6
5	16.6	63.8	172.2	184.8	13.9	272.3	57.3	12.6	6.5	3.4	1.5	0.6
6	13.6	51.7	146.6	139.8	12.3	249.5	51.7	12.0	6.2	3.1	1.5	0.6
7	13.6	41.9	125.0	106.0	11.1	228.2	46.5	11.1	5.9	3.1	1.5	0.6
8	13.6	33.9	165.1	80.1	10.2	209.1	46.5	10.5	5.3	2.8	1.2	0.6
9	13.6	27.7	393.9	72.1	8.7	181.6	38.5	9.9	5.2	2.8	1.2	0.6
10	13.6	45.3	865.2	64.7	7.7	160.7	43.1	9.2	4.9	2.5	1.2	0.6
11	13.6	247.3	1150.4	64.7	7.7	160.7	43.1	8.6	4.6	2.5	1.2	0.6
12	13.6	169.7	737.4	64.7	7.7	160.7	43.1	8.3	4.3	2.2	0.9	0.6
13	13.6	139.5	471.5	64.7	7.7	160.7	43.1	7.7	4.0	2.2	0.9	0.6
14	13.6	114.9	308.0	42.5	6.9	140.5	38.5	7.4	3.7	1.8	0.9	0.6
15	13.6	94.9	196.8	38.2	6.2	120.9	35.9	6.8	3.7	1.8	0.9	0.6
16	13.6	294.8	171.2	42.5	160.8	306.7	23.4	6.5	3.4	1.8	0.9	0.6
17	13.6	360.7	181.1	38.2	130.9	825.1	21.3	6.2	3.1	1.5	0.9	0.6
18	13.6	174.9	158.0	34.5	106.9	723.3	19.7	5.9	3.1	1.5	0.9	0.6
19	13.6	85.0	137.7	31.1	97.6	634.3	19.1	5.2	2.8	1.5	0.9	0.6
20	13.6	325.9	119.8	28.0	89.0	556.2	17.9	4.9	2.8	1.5	0.9	0.6
21	13.6	165.7	104.4	25.9	96.7	487.6	16.6	4.6	2.5	1.2	0.9	0.6
22	13.6	138.9	100.4	23.4	88.4	427.5	15.7	4.4	2.5	1.2	0.9	0.6
23	13.6	116.7	222.1	21.3	81.0	374.8	14.8	4.3	2.2	1.2	0.9	0.6
24	13.6	766.6	608.0	19.1	80.4	348.0	13.9	4.0	2.2	1.2	0.9	0.6
25	13.6	411.2	2118.1	17.2	74.2	328.0	12.9	3.7	2.2	1.2	0.9	0.6
26	13.6	222.7	751.8	15.4	68.1	304.6	12.0	3.4	2.2	1.2	0.9	0.6
27	13.6	120.4	1016.4	13.9	62.2	283.1	11.4	3.4	2.2	1.2	0.9	0.6
28	13.6	101.9	748.4	12.6	57.0	262.7	10.8	3.1	2.2	1.2	0.9	0.6
29	13.6	86.2	551.3	11.4	52.4	243.9	10.2	2.8	2.2	1.2	0.9	0.6
30	13.6	73.0	1159.0	10.2	47.7	226.7	9.2	2.8	2.2	1.2	0.9	0.6
31	79.2		881.3	9.2		210.4	2.5		1.2	0.9		

**STATUS SUMMARY REPORT
SUBSTRATE ENHANCEMENT
SEDIMENT MANAGEMENT PLAN
LAGUNITAS CREEK**

Prepared For:

**MARIN MUNICIPAL WATER
DISTRICT**

By:

Barry Hecht and Mark R. Woysner

of BALANCE HYDROLOGICS, Inc.

October 20, 1988

Table of Contents

		<u>Page</u>
1.0	Summary of sediment accumulation/depletion modeling for Lagunitas Creek, Marin County, California	5
2.0	The streamflow model	7
3.0	The sediment accumulation/depletion model	9
3.1	General approach	
3.2	Model structure and assumptions	
3.3	Runs conducted	
4.0	Sediment accumulation and streambed standards	21
5.0	Summary and sediment-management plan overview	32
6.0	References cited	35

Appendices

1. Description of computer modeling runs to date.
2. Relations of bedload-sediment transport to transport to streamflow used in a accumulation/depletion modeling.
3. Annual and cumulative discharge of water and bedload, by station.
4. Annual accumulation/depletion of bedload sediment in State Park Reach, Lagunitas Creek.
5. Relation of bed descriptions to observed sediment accumulation and depletion, Lagunitas Creek.
 - 5a. Glides
 - 5b. Pools
 - 5c. Riffles

List of Tables

	<u>Page</u>
1. Comparison of modeled and observed accumulation or depletion of sediment within the State Park Reach, Lagunitas Creek.	17
2. Cumulative accumulation/depletion in Lagunitas Creek for a thirty-year period, 1955 through 1984.	19
3. Annual results of accumulation/depletion in Lagunitas Creek for various bedload delivery regimes in San Geronimo Creek (K4).	20
4. Summary of bed descriptors monitored in Lagunitas Creek and their relation to habitat values and sediment management.	23
5. Streambed standards for salmonids in Lagunitas Creek proposed by Don Kelley.	25
6. Observed variations in mean streambed conditions, Lagunitas Creek, 1980 to 1982.	26
7. Summary of bedload sediment discharge at two sites on San Geronimo Creek, WY 1980 through WY 1982.	28

List of Figures

	<u>Page</u>
1. Map of Lagunitas Creek including stream and rain gaging locations.	8
2. Descriptive schematic of the streamflow and sediment budgeting model as applied to sediment accumulation and depletion.	12
3. Relations of daily peakedness to streamflow in Lagunitas and San Geronimo Creeks.	13
4. Bedload-transport rating curves for San Geronimo Creek at Lagunitas Road.	15
5. Bedload-transport rating curves for Lagunitas Creek at Tocaloma Bridge.	16
6. Location of bed-monitoring sites, Lagunitas Creek.	22
7. Inverse relation of embeddedness with bed-material size, Lagunitas Creek.	27

1.0 SUMMARY OF SEDIMENT ACCUMULATION-DEPLETION MODELING FOR LAGUNITAS CREEK, MARIN COUNTY

The Marin Municipal Water District has increased the capacity of Kent Lake from 16,000 to 32,000 acre feet by raising Peters Dam. MMWD plans to operate the enlarged reservoir in a manner resulting in reduced spills from winter storms. Both the number of individual events and the magnitude of the peak flows will decrease. The smaller, less-frequent spills may result in less sediment transport below the dam. Without adequate planning, sediment may accumulate in the channel of Lagunitas Creek downstream from Kent Lake. Sediment accumulation is one of two primary factors identified by biologist Don Kelley as presently constraining habitat values for steelhead and silver salmon, which use Lagunitas Creek and tributary streams for spawning and rearing.

This report summarizes the results of a sediment accumulation-depletion model developed for the reach of Lagunitas Creek extending downstream from Kent Lake to the Tocaloma Bridge. This portion of the stream, designated the "State Park Reach" by Kelley and Dettman (1980), is considered by biologists familiar with the stream to have the greatest importance for spawning, incubation, and rearing. Tributary streams, such as Devils Gulch and San Geronimo Creek, also provide habitat; however, they are not directly affected by operation of Kent Lake, and hence are not specifically assessed in the model. Reaches of Lagunitas Creek downstream from Tocaloma have more limited habitat values; in addition, those values are much less affected by bed sedimentation than by other physical and biological factors. Hence, accumulation and depletion below Tocaloma are not assessed.

The model used in this analysis develops estimates of the relative inflow and outflow of sediment for each day of a representative 30-year sequence of daily streamflows. On days when sediment inflow exceeds sediment outflow, a calculated net accumulation occurs on the bed; depletion is computed when outflows exceed inflows. The model is based on sediment-transport conditions observed during a period of intensive monitoring by our staff, beginning in November 1979 and extending through the summer of 1982. The relationships between streamflow and the rate of coarse-sediment transport observed in the course of about 40 separate storms during this three-year period serve as the bases for the computations. Contributions from erosion of the banks of Lagunitas Creek and from tributary watersheds are included.

This report also relates the findings of the model to a set of streambed indices developed by the project biologists, and which may have correlated with habitat value. In general, habitat quality is known to decrease as sediment accumulates on the bed or infiltrates into the sediments used for spawning and incubation. Embeddedness of cobbles and boulders, and sediment accumulations in pools are both of particular concern to the biologists. The model does not directly predict these values; rather, they are assumed to vary with net accumulation or depletion, based on observations made during our study, and in other Pacific Coast streams.

This study considers only bedload sediment. Bedload is the coarser fraction of the sediment load moved on or near the bed, and supported by the bed. Our work has shown that the bed of Lagunitas Creek is composed almost entirely of sediment of the sizes moved as bedload. The bed of Lagunitas Creek seldom contains more than a few percent of silts and clays, sizes usually transported as suspended sediment. While fine sediments may have specific and important effects on habitat values, the finer materials do not appreciably affect overall accumulation or depletion in Lagunitas Creek.

2.0 THE STREAMFLOW MODEL

Direct records of streamflow in Lagunitas Creek and in most West Marin watersheds are limited. The U. S. Geological Survey monitored daily discharge from 1954 through 1960 at a site just upstream from the present Nicasio Dam. The agency has also measured streamflow on Lagunitas Creek below Nicasio Creek since 1975 (site K10, Figure 1), and at the State Park gage (vicinity of K6, Figure 1) since March 1982. HEA and Kleinfelder staff have maintained a daily streamflow gage on lower San Geronimo Creek at Lagunitas Road (K4) since November 1979, and at site K6 from November 1979 through March 1983. All daily records have been developed with the direct support and close cooperation of MMWD. MMWD staff have also maintained daily records of spill rates from both Kent Lake and Nicasio Reservoir since their construction in 1955 and 1962, respectively.

Recognizing that bed conditions and streamflow vary substantially from year to year, MMWD chose to use a longer period of record for analysis of flows, bed conditions, and habitat values. A 30-year synthetic record of daily streamflows was developed by MMWD hydrologists, based on observed daily precipitation readings during the period 1955 through 1984. The model was initially calibrated using the extended record of daily runoff in the Napa River near Napa, and subsequently with data from the State Park gage on Lagunitas Creek. MMWD staff then estimated flows at selected points in the Lagunitas Creek system by correlation to the synthesized flows through the State Park. We then reviewed the preliminary mean daily discharges, and suggested changes in the correlation relations to minimize variance at the highest flows, which are disproportionately significant in transporting bed sediment.

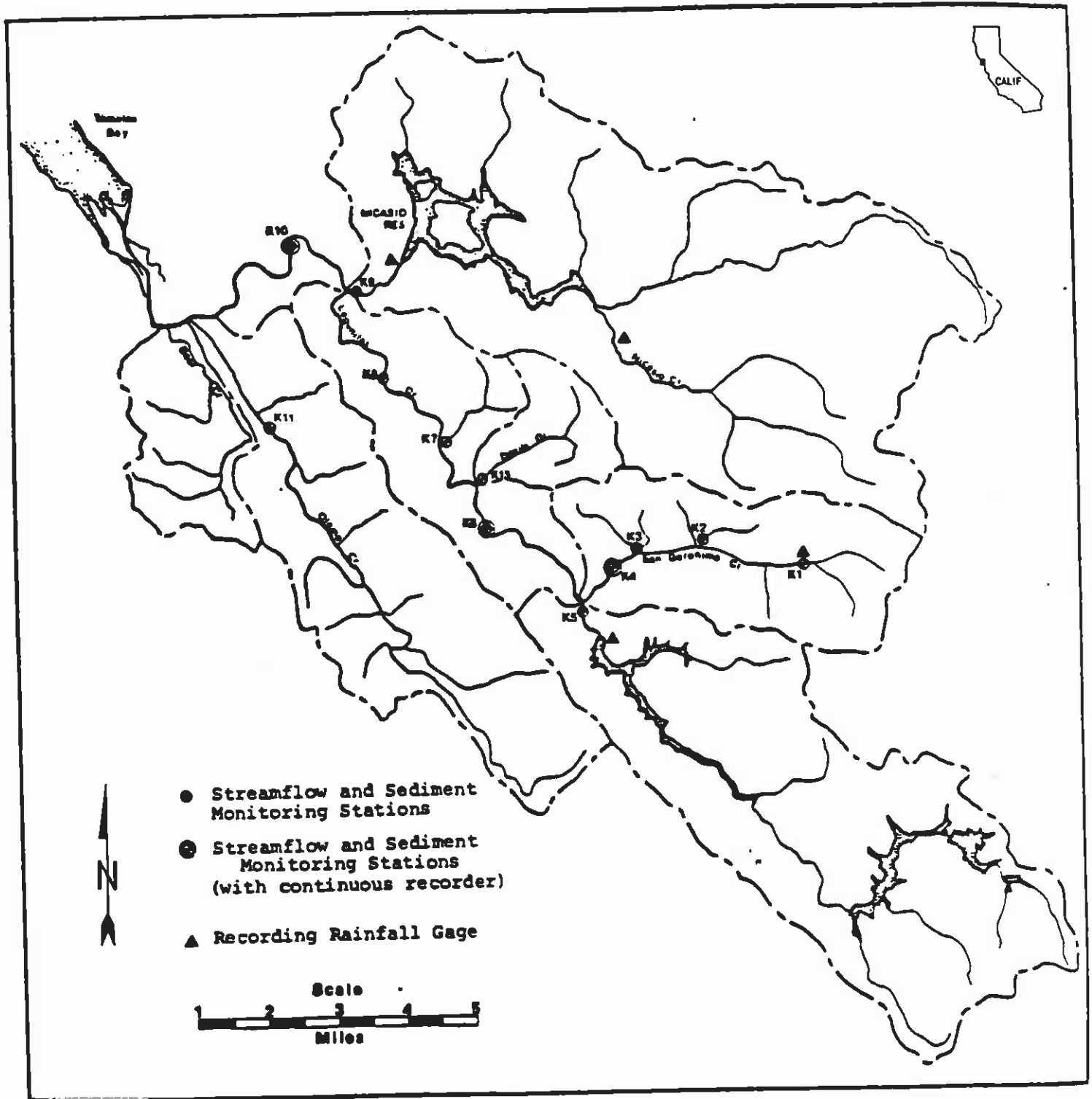


Figure 1. Location of Stream and Recording Rain Gages.

3.0 THE SEDIMENT ACCUMULATION/DEPLETION MODEL

The bed sediment accumulation/depletion model used is conceptually a numerical budget of inflows to and outflows from the State Park reach of Lagunitas Creek. Sediment enters the reach at Shafter, at the mouths of tributaries, and from bank erosion; it leaves by transport past the Tocaloma Bridge. Sediment entering and leaving the reach is computed for each day, using quantitative relations of bedload discharge to streamflow established from field measurements of sediment transport in Lagunitas Creek and its tributaries. Accumulation is computed when inflows exceed outflows; depletion occurs when outflows are larger than inflows.

3.1 GENERAL APPROACH

Accumulation or depletion of sediment in the State Park Reach was computed by comparing the amount entering the reach and the amount leaving the reach. Sediment was assumed to enter the reach from three separate sources:

1. San Geronimo Creek
2. Devils Gulch and smaller tributaries
3. Bank erosion along Lagunitas Creek

Sediment was assumed to leave the reach only by transport past Tocaloma. Results represent sediment accumulated on, or depleted from, approximately 1,300,000 square feet of bed between Shafter and Tocaloma. A uniform depth of accumulation or depletion over the entire bed was assumed for computational purposes, even though actual accumulation would not be uniform.

The change in storage (expressed in tons) was converted to net accumulation or depletion using a sediment density of 2600 lbs per cubic yard (96.3 lbs per cubic foot), a value developed by MMWD field staff from experience at Nicasio. Coarse sediment inflows and outflows were computed for each day of the thirty-year period of record. Each daily inflow and outflow of sediment was calculated based upon the simulated mean daily streamflow (computed by the MMWD model), and the most probable rate of daily bedload-sediment transport based on the observed relations for the three monitored years. Inflow from Devils Gulch and all smaller tributaries was set equal to a total of 1.01 times the sediment delivery from San Geronimo Creek, based on average observed contributions during the period of study. The contribution from erosion of the banks of Lagunitas Creek within the State Park Reach was set at a constant rate of 140 tons per year, of which 40 tons are thought to originate upstream from the State Park gage, and 100 tons downstream.

3.2 MODEL STRUCTURE AND ASSUMPTIONS

The model is functionally divided into individual programs, progressing through a series of steps to compute estimated annual sediment accumulation or depletion (figure 2). Initial model inputs of daily mean streamflow applied to empirically-derived functions, known as bedload-transport rating curves, to calculate daily mean bedload transport at each station. Within the assumptions of this study, the bedload-transport curves are generally thought to represent those prevalent during normal bed and watershed conditions. The curves upon which this routine is based are shown in Figure 3. We apply an adjustment factor (Figures 4 and 5) to the mean daily streamflow in computing bedload delivery, as using the mean daily values may result in a considerable underestimate of actual transport; the adjustment has the effect of approximating computation of sediment transport based on hourly data. The adjustment factor varies with mean daily streamflow, and is based on empirical data from approximately 100 storm days over the three-year period of intensive monitoring on Lagunitas Creek.

Once daily mean bedload sediment transport at each station is computed, a budgeting routine is applied to compute sediment accumulation and/or depletion between stations. Tributary watershed contributions are included based on observed proportions to sediment delivery from the San Geronimo Creek. The constant annual rate of bank erosion is equally divided into daily contributions. The model is capable of treating either tributary or bank contributions as adjustable parameters. The program systematically computes between-station differences in bedload transport for each day and adds the tributary and bank contributions for each subreach. Net change in storage is totaled and printed as daily, monthly, or annual summaries, expressed as ton. A conversion to mean sediment accumulation or depletion (expressed in feet) by sub-reach may also be printed.

3.3 RUNS CONDUCTED

Several computer runs have been conducted to explore various patterns of spills and releases in Lagunitas Creek (Appendix 1). Two sets of streamflow data representing hydrologic conditions of the old and enlarged dam heights at Kent Lake have been synthesized by Marin Municipal Water District staff.

Simulated streamflows at the following stations were used in the sediment modeling, for both the pre- and post-project conditions:

K1	San Geronimo Creek at San Geronimo Water Treatment Plant
K4	San Geronimo Creek at Lagunitas Road, near mouth
K6	Lagunitas Creek at the State Park gaging station
K8	Lagunitas Creek at Tocaloma Bridge

We developed synthetic streamflows for the station at Tocaloma Bridge by correlation to station K6, using 20 paired discharge measurements we performed during 1980 and 1981. The

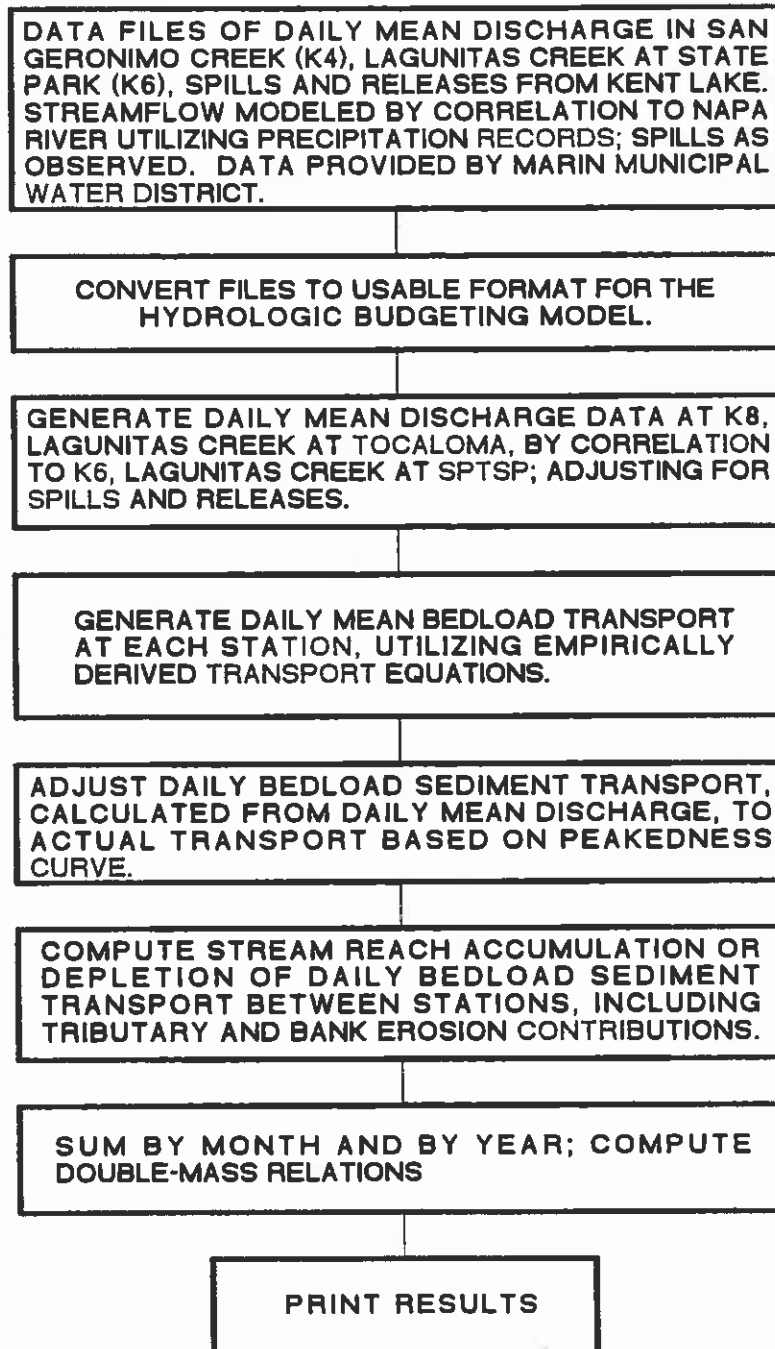


FIGURE 2. DESCRIPTIVE SCHEMATIC OF THE ACCUMULATION/DEPLETION MODEL

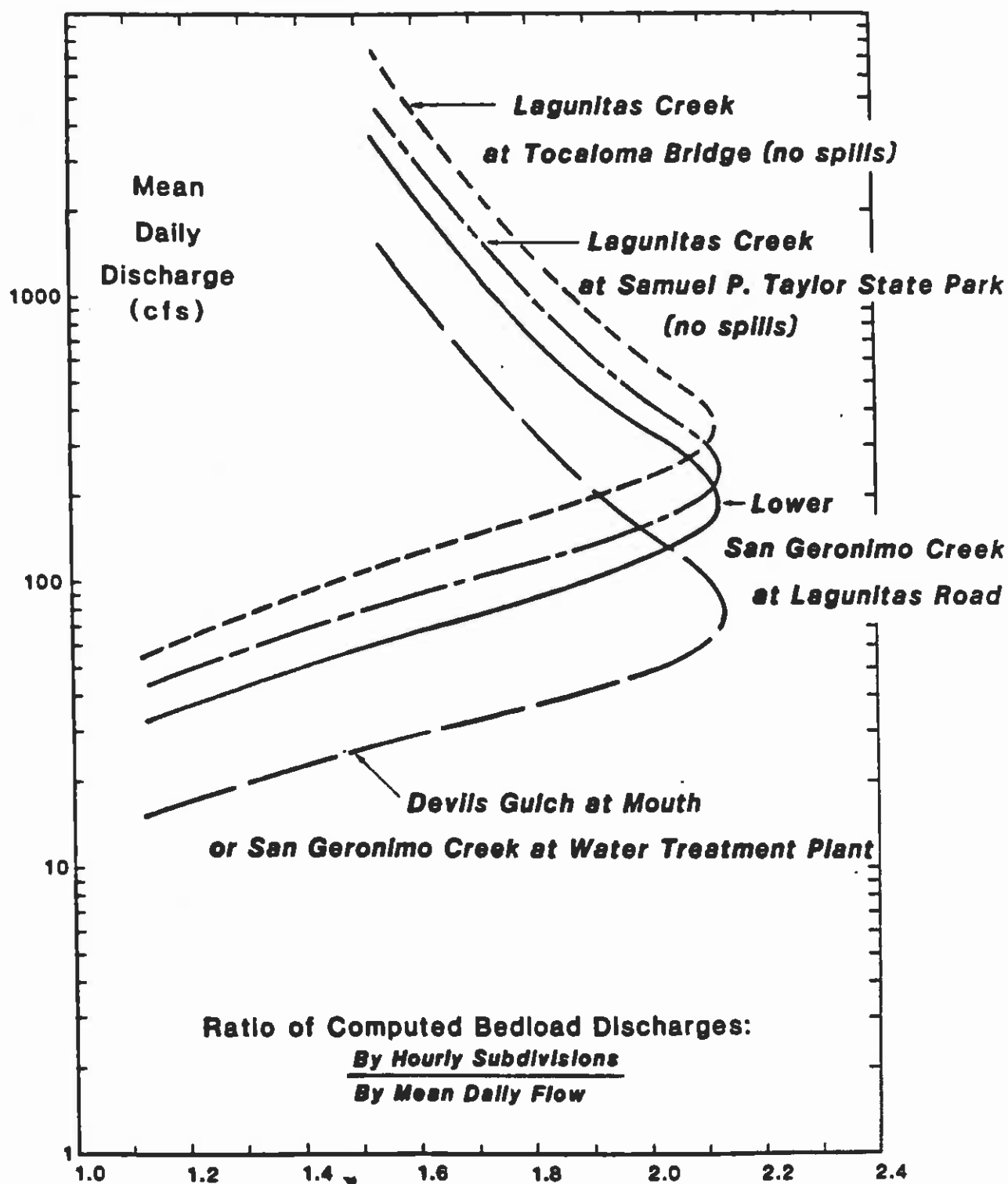


Figure 3. Ratio of Bedload Discharges Computed From Mean Hourly or Mean Daily Streamflow Data.

Computations based on hourly data, used throughout this study, are especially important for storms of intermediate size. Curves are based upon computed ratios from approximately 40 storms during the 1980-1982 seasons for which complete data sets are available.

regression equation:

$$K8 = 2.09 K6^{0.92}$$

has a computed correlation coefficient (r^2) of 0.994.

Bedload-rating curves determined from field measurements were used in the model. The relations used and the data upon which they are based are shown in Figures 4 and 5, for San Geronimo Creek (K4) and Tocaloma (K8), respectively. It should be noted that these are exponential functions, plotted on log-log paper; hence, nearly all transport occurs at the highest flows, corresponding to the 20 to 25 percent of each relation nearest the right-hand margin.

At the Tocaloma Station, K8, available data were collected exclusively during water years 1980 and 1981, generally considered representative of normal transport conditions. The relations developed from these measurements were applied uniformly throughout the modeled period. Bedload unfortunately was not collected at this station during the transient and episodic conditions following the January 1982 storm event. Upstream, at the State Park gage, (K6: figure 1) bedload-sediment transport at a given flow increased many-fold following the January 1982 event. Because sediment-rating curves appropriate to normal streambed and watershed conditions were used at K8, sediment transport is assumed to be understated.

Simulations were compared with observed variations in accumulation and depletion to afford some context by which the model's validity and precision may be assessed. Results, presented in Table 1, indicate that model useably predicts net accumulation and depletion under the conditions prevailing during the period of field observations, provided that a sufficient number of stations are monitored. Higher rates of bedload transport through the San Park reach are anticipated under severely-sedimented conditions, when sediment is finer, more available, and

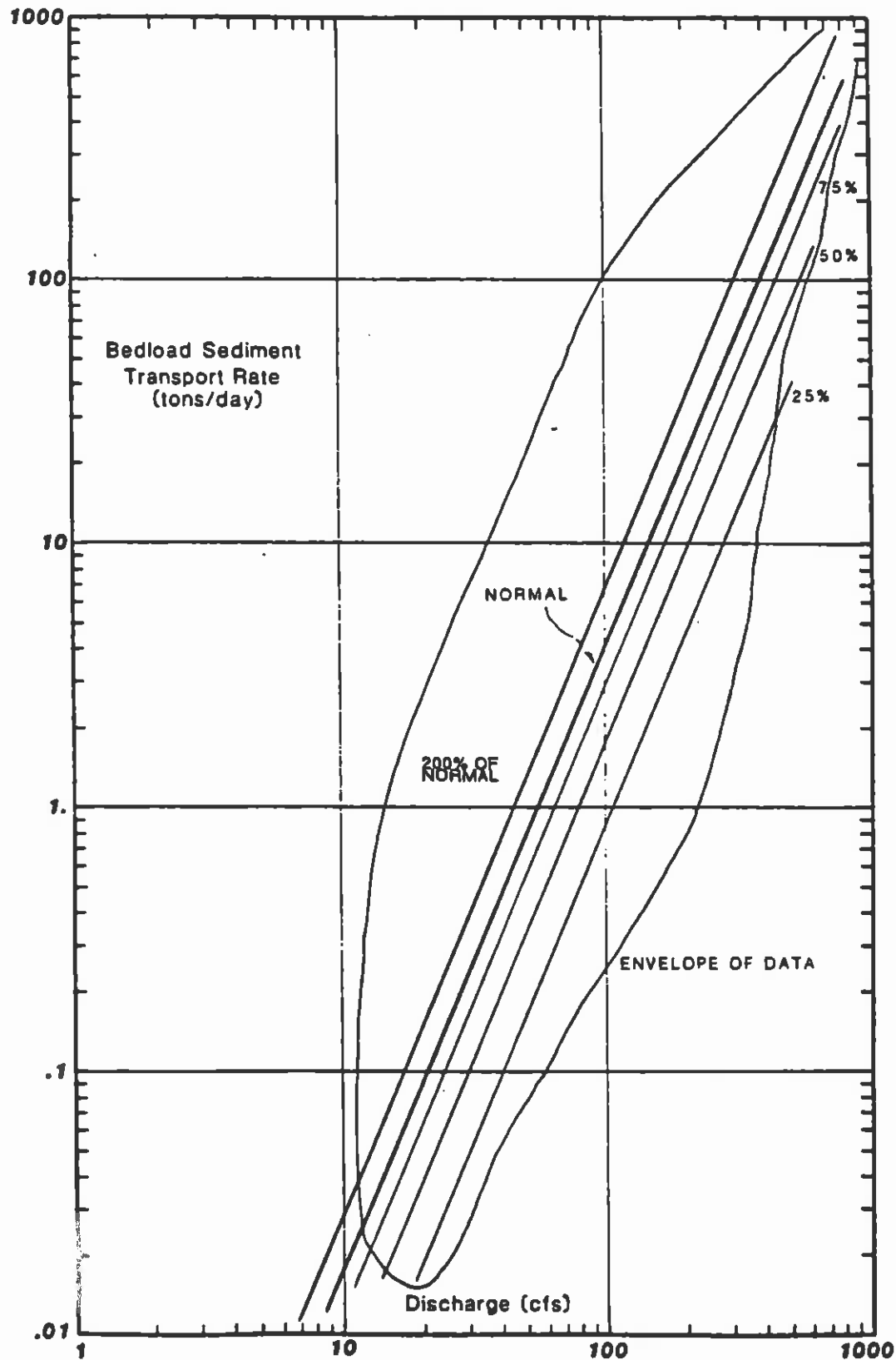


Figure 4. Bedload Sediment Transport Rating Curves for San Geronimo Creek and Lagunitas Road (K4). Sediment transport can vary with watershed practices; the proportion of "normal" transport rates assumed in sediment control scenarios are shown. Observations made in WY1980, 1981, 1982, and 1986 serve as the bases for the data envelopes.

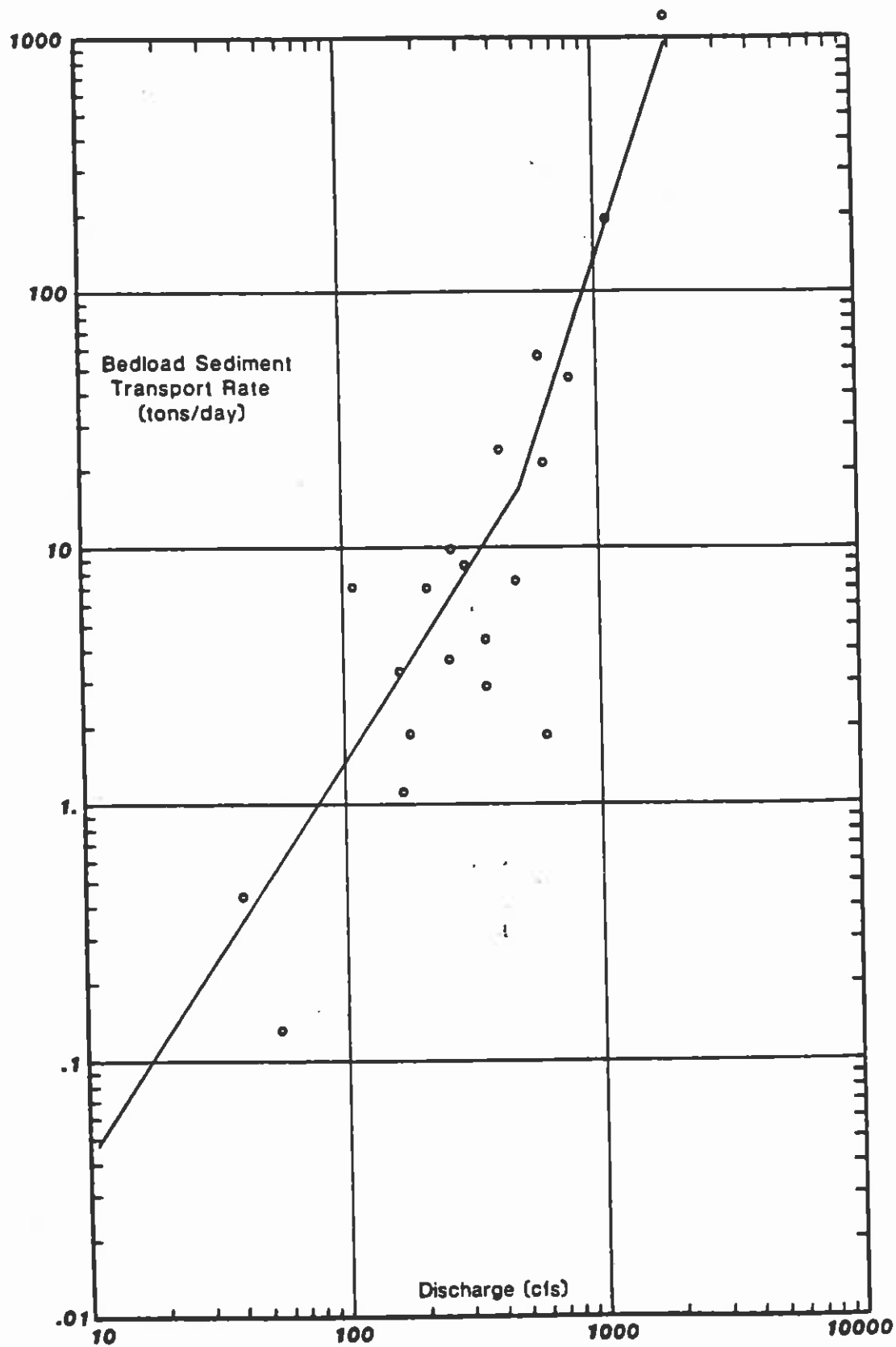


Figure 5. Bedload Sediment Transport Rating Curve for Lagunitas Creek at Tocalomas Bridge, WY1980 and WY1981 Data. Virtually all sediment is transported at the high flow for which the steeper limb of the transport curve applies.

Table 1

Comparison of Modeled and Observed
Accumulation or Depletion of Sediment
Within the State Park Reach, Lagunitas Creek

Period Bracketed by Survey		Average Sediment Accumulation or Depletion	
Initial Survey	Final Survey	Simulated ^{a/} (ft)	Observed ^{b/} (ft)
Feb. 1980	July 1980 ^{c/}	+ 0.031	- 0.083
July or Nov. 1980 ^{a/}	Feb. 1980 ^{d/}	+ 0.003	+ 0.0060
Feb. 1981 ^{d/}	Summer 1981 ^{d/}	+ 0.001	+ 0.0056
Summer 1981 ^{e/}	Summer 1982 ^{d/e/}	+ 0.18	+ 0.24

^{a/} Normal bedload sediment transport at K4 and K8 is assumed.

^{b/} From Table 12 of Phase IIIb report.

^{c/} Three bed-monitoring sites.

^{d/} Eight bed-monitoring sites.

^{e/} Includes effects of January 4, 1982 storm and 16000 acre-foot flush of January 4-19, 1982.

more mobile; the model is expected to significantly over-estimate accumulation during such periods, as no related adjustment in outflow has been incorporated.

Coarse-sediment delivery to Lagunitas Creek from San Geronimo Creek was conceptually treated as an independent variable in the model. Five bedload-transport conditions at this station were simulated -- normal, 200% normal, 75% normal, 50% normal, and 25% normal -- to best represent existing transport conditions, increased transport effects from a watershed disturbance, and the effects of watershed practices, such as bank protection or sediment retention. The effects of various rates of sediment delivery on the two subreaches of the State Park reach are shown in Table 2. Mean accumulation and depletion within the entire reach at the end of each of the 30 years of simulated record are shown in Table 3, for the five sets of bedload-delivery assumptions used in the model. A reduction of 10 to 20 percent in coarse-sediment delivery from San Geronimo Creek is expected to roughly offset the diminished flushing capacity of the proposed operating regime. Enhanced bed conditions are likely to prevail with further reductions. Monitoring of bed conditions is warranted to verify, calibrate and adjust these projections.

Table 2

**Cumulative Average Accumulation/Depletion in Lagunitas Creek
For a Thirty Year Period, 1955 Through 1984
Enlarged Kent Lake Conditions**

Percent of Normal^{a/} Sediment Delivery	State Park Reach K4 K8 (ft)	Upper Sub Reach^{c/} K4 K6 (ft)	Lower Sub Reach^{d/} K6 K8 (ft)
200% (worst case) ^{b/}	+3.7	+6.6	+1.4
Normal 100% (normal)	+0.4	-0.5	+1.1
75%	-0.4	-1.6	+1.1
50%	-1.3	-2.6	+1.1
25%	-2.1	-3.7	+1.1

^{a/} Sediment outflows at Tocaloma (K8) is constant for all five modeling runs, assumed normal transport conditions; sediment transport from San Geronimo (K4) is treated as an independent variable.

^{b/} Increased sediment transport at K6, resulting in the distribution of more sediment downstream of the State Park gage. Other runs use normal transport curves at K6.

^{c/} Upper Sub Reach is from Shafter Bridge to the S.P. Taylor State Park stream gage.

^{d/} Lower Sub Reach is from S.P. Taylor State Park stream gage to Tocaloma.

Table 3

**Annual Average Accumulation or Depletion of Bed Sediment
Within the State Park Reach, Lagunitas Creek
(feet)**

Year	Bedload Sediment Delivery From San Geronimo Creek				
	Twice Normal	Normal	75% Normal	50% Normal	25% Normal
1955	0 feet	0 feet	0 feet	0 feet	0 feet
1956	+.4	+.1	+.1	0	-.1
1957	0	0	0	0	0
1958	-.1	-.3	-.3	-.3	-.4
1959	0	0	0	0	0
1960	+.1	0	0	0	0
1961	0	0	0	0	0
1962	+.1	0	0	0	0
1963	+.2	+.1	0	0	0
1964	0	0	0	0	0
1965	+.1	0	0	0	0
1966	+.1	+.1	0	0	0
1967	+.8	+.1	0	-.2	-.4
1968	0	0	0	0	0
1969	+.1	0	0	0	0
1970	+.5	0	-.1	-.2	-.3
1971	+.1	0	0	0	0
1972	0	0	0	0	0
1973	+.6	+.1	0	-.1	-.2
1974	-.1	-.2	-.2	-.2	-.2
1975	+.1	0	0	0	0
1976	0	0	0	0	0
1977	0	0	0	0	0
1978	0	0	0	0	0
1979	0	0	0	0	0
1980	+.1	0	0	0	0
1981	0	0	0	0	0
1982	+.5	+.2	+.1	0	-.1
1983	0	-.2	-.2	-.3	-.3
1984	+.1	0	0	0	0
TOTAL	+3.7	+0.4	-0.4	-1.3	-2.1

Note: Only one significant figure presented for clarity; for quarter detail, see Appendix 4.

4.0 SEDIMENT ACCUMULATION AND STREAMBED STANDARDS

One of the tasks initially outlined in the agreement of October 1979 was to relate bed sedimentation to specific habitat value indices, preferably in a manner as quantitative as possible. It was recognized at that time that virtually no previous work along these lines had been conducted in coastal streams. While biologists and resource managers knew that sediment impaired habitat values, usable means of measuring bed sedimentation and relating these to habitat indices had yet to be developed, particularly for the rearing stage of the salmonid life cycle. Measures of this type were deemed needed to provide a baseline against which the effects of operating a larger Kent Lake might be assessed, and to provide criteria for evaluating the success of sediment-management measures.

We measured a total of ten major types of bed descriptors within four major categories:

1. Bed configuration
2. Composition of the streambed surface
3. Particle-size distribution of sediment stored beneath the surface
4. Embeddedness of cobbles

The descriptors and their relations to habitat values and sediment management are presented in Table 4. Each of the bed descriptors was monitored over a period of two or three years in a pool, glide, and riffle at one site within each of the 11 kilometers of Lagunitas Creek between Shafter and the confluence of Nicasio Creek (Table 4). Cross-sectional surveys of the bed were also taken immediately following the bed-condition measurements, so that net accumulation and depletion of sediment could be related to changes in other habitat indices. The manner in which



Figure 6. Location of Bed-Monitoring Sites, Lagunitas Creek.

Table 4. Summary of Bed Descriptors Monitored in the Lagunitas Creek Geomorphic Studies WY1981, WY1982 and Their Relation to Habitat Values and Sediment Management.

Bed Condition or Descriptor	Relation to Habitat Values	Relation to Sediment Management
I. Bed Configuration A. Pool Area, scour and fill as a function of position	Most unequivocal basic measure of sediment accumulation and depletion.	The basic unit for measuring change in amount of sediment stored in the channel (see I.C., below).
B. Bed boundary scour and fill at a position	A minimum value for maximum scour and/or fill over a given period. Large values in sections with spawning activity suggest high risk of egg loss. May also affect lampreys and other organisms.	Not significant except as an indicator of bed instability and its possible causes.
C. Material added or removed from each riffle-pool-glide sequence.	Single most important measure of which reaches are affected by sedimentation. Derived from I.A., above.	Identifies the location and amount of sediment accumulation and depletion.
D. Relative segmental relief (relative extent of development of pools, riffles, glides).	Deeper pools are preferred by juvenile salmon. Riffles probably produce most food; they are principal habitat for young steelhead. Deeper pools and glides probably preferred by <i>Syncaia pacifica</i> . This is the principal material impairing rearing habitat. It may also approximate bed composition in spawning areas, and may have bearing on any egg emergence problems.	Accumulating sediment diminishes pool depth, and the relative pool/riffle relief.
II. Particle-Size Distribution of Sediment Stored Beneath the Bed Surface		May be one of the most sensitive indicators of relative sediment accumulation and depletion.
III. Composition of the Bed Surface A. Coarse sediment size distribution	Coarse sediment provides the cover that is the basis of rearing habitat; quantified as cobble abundance. Affects many other aspects of the aquatic ecology, including food production, bottom-dweller habitat, and species diversity.	Closely related to bed mobilization thresholds. Large pebbles and small cobbles may be more densely packed. Recent research (Parker and Klingeman, 1982; Andrews, in press) suggests that the bed-surface distribution may be largely governed by sizes in storage beneath the bed, a new concept.
B. Percent of bed area covered by sand and silt.	Fine material typically covers less than 15 percent of the bed surface in Lagunitas Creek, except locally. Larger percentages may seriously alter the aquatic ecology of the stream.	An index of the amount of sand and finer material on the bed surface.
C. Bedrock percentage of bed area	Unknown. Intuitively, a small percentage of bedrock may indicate a relatively "clean" pool or riffle. In some cases (e.g. site 16) the percentage of bedrock is so large that it probably constrains habitat values.	Limits and describes the extent of scour.
D. Coarse organic elements.	Root mats, snags, limbs, seaweed clumps, and similar features provide rearing for salmonids and many other species.	Minimal, as measured for this study. Root mats and snags can strongly alter bed and channel form in coastal streams, especially when these are bedly sedimented. In this study, we quantify the relative habitat provided by coarse organic material, and not its stability value.
IV. Embryotoxicity	Ecology and bottom have shown a strong inverse relation between embryotoxicity and the populations of juvenile steelhead. Other species may be similarly affected.	One of the fundamental goals of this study is reducing mean bed embryotoxicity.

data were collected allows assessment of habitat change by segment (pool, riffle, glide) at a site over time, or of changes in a downstream direction, or in response to known storms or sediment-delivery events.

Results of the bed monitoring are presented as Tables 11 through 16 in the Phase IIIb report, of January 1983. In subsequent studies by Don Kelley and his associates, the biologists chose to focus upon three of the descriptors:

1. Proportion of the bed covered by cobble-sized material
2. Mean embeddedness of the cobbles
3. Proportion of the bed mantled by habitat-impairing sand, silt, and other fine sediments.
4. Mean percent of sediment in multiple redds that is finer than 3 mm at the end of silver salmon and steelhead incubation.

Using the first three descriptors, the biologists developed a set of proposed streambed standards for pools, riffles, and glides (Table 5). Our analysis of the field data in light of the proposed standards shows that:

1. At individual sites, the descriptors used for proposed streambed standards were quite sensitive to observable changes. For example, several tens of tons of coarse sediment were introduced into the pool at site KJ in 1981, as a result of erosion related to road and utility improvements at the State Park facilities. Most of this material was deposited in a large delta at the mouth of the tributary, and subsequently covered by vegetation. The lower portion of the pool, and the glide and riffle areas downstream, could visibly be seen to be affected by sediment washed from the delta area, but just at level of discernment by eye. The bed descriptors reflect this sedimentation event in a clearer, more quantitative manner (see Appendices 5a, 5b, 5c).

2. Large changes in bed indices at several sites reflect other localized disturbances, such as channel changes, fallen trees, or washouts of debris jams in the reach upstream of the site. Streambed standards should be applied with some analysis of what changes may have occurred at or near each site. Additionally, average values, as proposed by Kelley and his co-workers, are more appropriately used than trends over time at any one site.

3. A relatively narrow range of bed conditions was observed during the three-year monitoring period (Table 6). In all cases, the bed was probably in a condition more favorable than usual for habitat values. We had hoped that the data collected following the 1982 storm would have provided the contrast and range required to define a sound relation of bed-standard variation with sediment accumulation and depletion. The bed, however, was in a relatively "flushed" condition following the 1982 season due to:

Table 5. Streambed Standards for Salmonids Proposed by Don Kelley.

Habitat Type	Average Percent Embeddedness of Cobble (>45 mm) ¹		Average Percentage of Streambed Area Covered by Cobble (>45 mm)		Area of Spawning Habitat in Glides (% of amount measured in 1984-1985)	Average Percent of Redd Material that is Sand and Fine Sediment <3 mm at end of incubation
	Maximum Allowable	1981 Level	Minimum Allowable (1981 level)	Goal	Minimum Allowable	Maximum Allowable
RIFFLE	25	22	50 ²	80		
POOL	30	27	23 ²	40		
GLIDE	30	28	19 ²	40	80	10
Flows at which measures should be made.	4-8 cfs		4-8 cfs		10-16 cfs	January - March when flows are low enough to obtain samples.

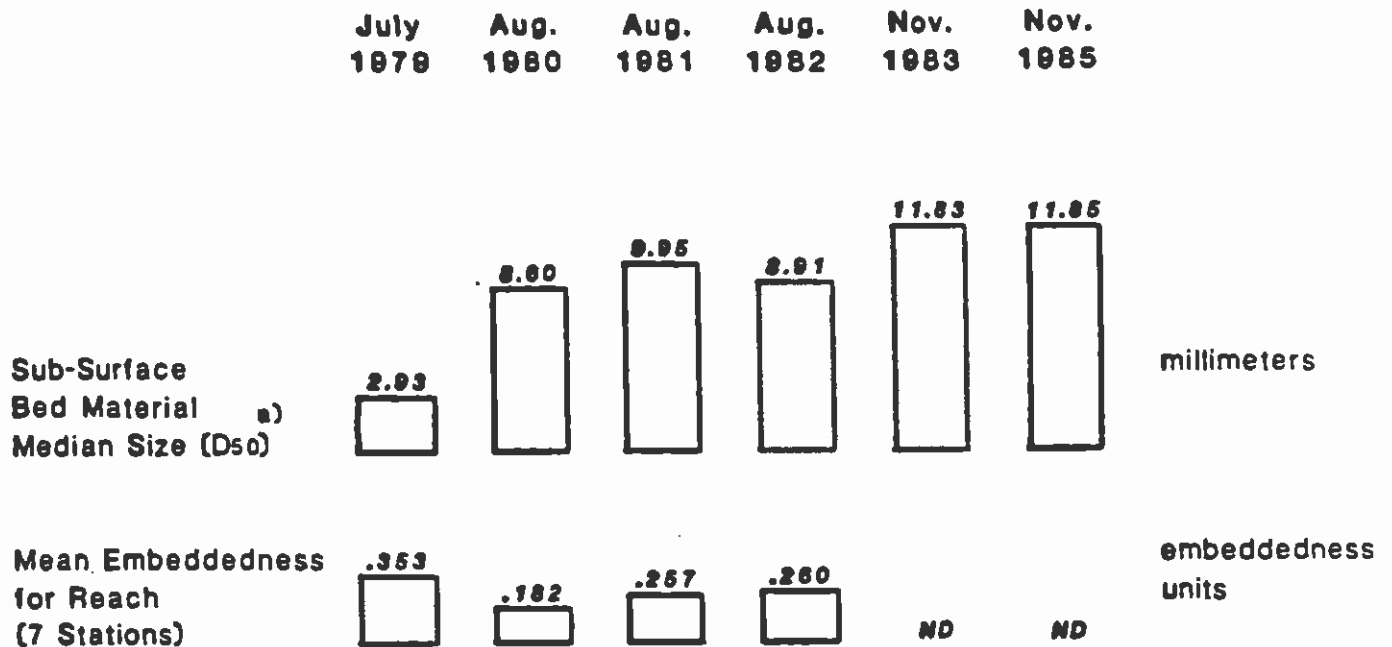
1 Percent embeddedness is the percent of the cobble's height that is embedded in sand.

2 Data from Hecht (1983) collected during 1981 to serve as baseline streambed conditions in Lagunitas Creek.

Table 6

Variation In Mean Observed Streambed Conditions,
Lagunitas Creek, 1980-1982
Upper State Park (KH) to Cheda Ranch (KL)

	Fall 1980	Feb. 1981	Summer 1981	Summer 1982
Riffles				
Mean accumulation or depletion (ft.)	-	+0.019	+0.010	+0.232
Mean embeddedness (percent)	27.4	31.1	22.3	28.9
Cobble abundance (percent of bed area)	54.4	49.1	48.4	48.4
Percent of bed area covered by fines	6	7	5	3
Pools				
Mean accumulation or depletion (ft.)	-	nil	-0.001	+0.206
Mean embeddedness (percent)	28.8	34.2	28.1	23.7
Cobble abundance (percent of bed area)	33.3	26.9	23.1	40.2
Percent of bed area covered by fines	16.0	14.7	11.3	8.2
Glides				
Mean accumulation or depletion (ft.)	-	+0.033	+0.011	+0.107
Mean embeddedness (percent)	34.0	33.3	26.7	32.1
Cobble abundance (percent of bed area)	24.0	22.3	19.4	27.6
Percent of bed area covered by fines	9.5	8.9	6.0	6.6



a) Median size of bed material of site 15.80, about 0.4 miles downstream from Shafter Bridge, near Kelley's Upper State Park Station

Figure 7. Inverse Relation of Embeddedness with Sub-Surface Bed Material
 Samples of sub-surface bed material are collected to depths of 6 to 10 inches, after removing the bed-surface or "armored" layer. Data shows the small range of bed-condition variations during the 1980-1982 monitoring period relative to those prevailing before and after. We believe that habitat values improve with increasing size of sub-surface bed material, and with decreasing embeddedness.

Table 7.

Summary of Bedload Sediment Discharge
Two Sites on San Geronimo Creek
WY 1980 through WY 1982a/

Station No. Stream Station Drainage Area	K1 San Geronimo Cr. Water Treatment Plant 3.3 sq. mi.	K4 San Geronimo Cr. Lagunitas Road 8.7 sq. mi.
<u>Bedload-Sediment Discharge</u> ^{b/}		
WY1980	1750-200 tons ^{c/}	4830 tons
WY1981	173 tons	264 tons
WY1982a ^{d/}	3910 tons	6125 tons
WY1982b (Jan 4, 1982 storm) ^{e/}	2260 tons	19800 tons
WY1982c	5830 tons	2960 tons
Subtotal, "Normal" Watershed Conditions		
(WY1980, WY1981, WY1982a)	6000 tons	11000 tons

a/ Values from Tables 8, 9, 18, Phase IIIb report.

b/ Annual values given as computed using methods described in earlier reports; actual precision is lower than implied by computations. The subtotal values are rounded, better reflecting monitoring precision.

c/ Estimated value, after detailed adjustment for two separate major bank collapses immediately upstream of station; see Phase IIIb, Table 8, footnote d.

d/ Through January 3, 1988; by Jan. 3, seasonal runoff was more than twice mean annual runoff.

e/ January 4-6, 1988. Estimates for the water treatment plant developed from intensive data collection during most of storm, as we were not able to reach other stations due to closed roads. The estimate of 19800 tons at site K4 is a most-probable value between possible high and low estimates of 56,000 and 5800 tons, respectively. See Phase IIIb report, Table 9 and associated text for details.

- a. Release of 16,000 acre feet from Kent Lake immediately following the January 4, 1982 storm event, to conform with dam-safety requirements; this release constituted 15 consecutive days of flows gradually diminishing from 650 to 400 cfs.
- b. Spills during mid-April 1982, which continued at flows capable of transporting sediment for 7 to 10 days following the end of sediment delivery from the tributaries.

We found that significant aggradation occurred during the January 1982 storm and flood. The bed, however, was smoothed by the tremendous amounts of water released following the storm, and perhaps re-groomed by the end-of-season flows.

As a result, only poorly-defined relations between the bed descriptors used as streambed standards and the actual sediment accumulation and depletion may be developed from the Lagunitas Creek data (Appendix 5, Tables A,B,C). The observations provide an invaluable quantification of baseline conditions, characterize the response of the bed to varying flows, and establish the downstream changes in bed conditions from Shafter to Tocaloma. They do not, at present, extend over a sufficiently broad range of bed conditions to provide a quantitative basis for projecting the future status of individual streambed-standard indices.

We believe at this time that the sediment-management program for Lagunitas Creek should be based on an operational criterion of non-accumulation. If the stream is managed to prevent accumulation, the streambed standards are most likely to be sustained. Other physical factors noted to be biologically important, such as relative pool depth (Kelley and Dettman 1979; Bjornn and others, 1977) or backwaters and near-bank areas with little flow velocity and suitable cover and water depth (Eng, 1981; Li, 1983), are also likely to be preserved. In this respect, observations in Lagunitas Creek are consistent with those in the literature relating accumulation and depletion to embeddedness, cobble abundance, and percent of bed covered by fine material (e.g., Bjornn and others, 1977; Hecht, 1981; Lisle, 1982; Parker and Klingeman, 1982; Nolan and others, 1983; Hecht and Woyshner, 1984).

If managing Lagunitas Creek to prevent sustained sediment accumulation is taken to be the operating criterion for sustaining the streambed standards, the simulations indicate that a reduction of 10 to 20 percent in coarse sediment contributions from San Geronimo Creek would be needed (Table 3). As the model projects for accumulation or depletion a mean value for the entire State Park reach, a somewhat larger reduction might be sought if protection of certain specific subreaches is deemed particularly critical to habitat maintenance. We believe, based on preliminary field results to be reported elsewhere, that reduced coarse-sediment delivery of this magnitude may be achieved by sediment retention and removal or by increased bank protection along San Geronimo Creek and certain of its tributaries, combined with limited sediment retention.

Potential retention basin sites at the San Geronimo Water Treatment Plant and near Shafter Bridge can be hypothetically considered as representative of upstream and downstream sites. Coarse-sediment delivery by San Geronimo Creek at these two locations can be represented by the 1980 through 1982 monitoring results from the stations at the Water Treatment Plant bridge (K1) and the Lagunitas Road Bridge (K4), shown in Table 7. While the proportion of San Geronimo Valley's bedload discharge originating upstream of the Water Treatment Plant may be expected to vary from year to year, the three years of record suggest that 50 to 60 percent of the coarse sediment load originates above the Water Treatment Plant during years of normal watershed conditions. Detailed inventory of sediment contributions from eroding bank segments of the main stem and larger tributaries conducted in October 1987 indicate that approximately 40 percent of the coarse sediment entering the channels from eroding banks is contributed upstream of the Water Treatment Plant. For planning purposes, the two independent sets of data indicate that approximately 50 percent of the total coarse-sediment load originates from the upper portion of the watershed, and would be under normal watershed conditions amenable for control by retention or by a combined bank-protection and sediment-removal program sited at or upstream

from the Water Treatment Plant. In the appended tables, values computed using 50 percent of the total coarse-sediment load for the valley may be taken to apply to a possible program of this type. Plans for a site at or near Shafter may be based on the monitoring results for the lower San Geronimo Creek station in Lagunitas (K4). Intensive site-specific studies are warranted prior to developing operating plans for a basin at either site.

5.0 SUMMARY AND SEDIMENT-MANAGEMENT PLAN OVERVIEW

1. Streambed sedimentation management is critical to overall management of flows in Lagunitas Creek because bed conditions appear to affect habitat productivity as much as flows. Release of more water will be needed to support or enhance habitat if the bed is highly sedimented; conversely, less water may be released if suitable bed conditions are maintained.
2. A bed-sedimentation model was developed which simulates the net accumulation or depletion of sediment on the bed of the critical habitat reach. The model is based on the net change in sediment storage; it compares sediment delivery from San Geronimo Creek, other tributaries, and bank erosion along subreaches of Lagunitas Creek with outflow past Tocaloma. The model was applied to each day of a continuous 11000-day (30-year) record of streamflows for Lagunitas Creek computed by MMWD staff.
3. The model was used:
 - a. To compare mean accumulation and depletion of sediment on the bed of the State Park reach under flow patterns prevailing before and after the enlargement of Kent Lake.
 - b. To assess the potential effects of various land-use practices and conservation programs in San Geronimo Valley on bed conditions in Lagunitas Creek below the confluence of San Geronimo Creek.
4. We found that the computed sediment accumulation/depletion over the 30-year period was -2.1 feet if the dam were operated as prior to its raising, and 0.4 feet if operated as

proposed by MMWD. The assumptions of the simulation perhaps overstate the extent of accumulation, in that they do not incorporate the greater rate of bedload transport which occurs under severely-sedimented conditions. The simulations do, however, serve as a common basis for comparing expected pre- and post-project conditions, provided that this overstatement is recognized.

5. A reduction of about 10 to 20 percent in the coarse-sediment delivery from San Geronimo Creek would likely offset the diminished flushing capacity of the proposed operating regime; further reductions are likely to enhance bed habitat values under most watershed conditions.
6. Either sediment retention basins or a combined bank-stabilization and sediment-retention program may be used to achieve a reduction of 20 percent, or more, in coarse-sediment delivery.
7. The model closely reconstructed the observed net accumulation and depletion observed at eight bed-monitoring sites over three separate storm periods during 1981 and 1982.
8. We were not able to establish a usable empirical relation between accumulation or depletion of bed sediment and the specific streambed standards recommended by biologist Don Kelley and his colleagues, perhaps because too narrow a range of bed conditions prevailed during the three years of field study. Experience in other coastal streams and elsewhere in the range of salmon and steelhead establishes that habitat deteriorates as sediment is allowed to accumulate on the bed. Accordingly, we recommend a criterion of no net accumulation of sediment in the State Park Reach as being a useful index under which the streambed standards recommended by the biologists are likely to be achieved. We believe that the simulated record of accumulation and

depletion provides a useful means of assessing long-term trends and shorter-term fluctuation in these streambed standards.

9. The criteria of no net accumulation of sediment is also expected to meet habitat needs identified for Syncaris pacifica, an endangered freshwater shrimp populating Lagunitas Creek.
10. Erosion-control, sediment-retention and bed-sedimentologic monitoring plans will be needed to implement the recommended management program. Related work is under way.

6.0 REFERENCES CITED

Bjornn, T.C., M.A. Brusven, M.P. Molnau, J. H. Milligan, R.A. Klamt, C. Chacho, C. Schaye, Transport of Granitic Sediment in Streams and Its Effects On Insects and Fish. College of Forestry, Wildlife and Range Sciences, University of Idaho, Bulletin Number 17. 43 p. September 1977.

Bratovich, P.M. and D. W. Kelley, Instream Flow Recommendation For Coho Salmon and Steelhead Trout In Lagunitas Creek, Marin County, California: D. W. Kelley & Associates. Report to the Marin Municipal Water District, 216 p. 1986.

Bratovich, P.M., D.H. Dettmen, and D.W. Kelley, Investigations of Salmon and Steelhead In Lagunitas Creek, Marin County, California, Volume II: Recommendations for Managing Instream Flows and Streambed Characteristics: D.W. Kelley & Associates, Report to the Marin Municipal Water District, 88 p. May 1988.

Chatham, S. Interim Report San Geronimo Creek Streambank, Erosion Control, Marin County, California. Prunuske/Chatham, Report to the Marin Municipal Water District. Var. pg. December 1987.

Eng, L.L., Distribution, Life History, and Status of the California Freshwater Shrimp, Syncaris pacifica (Holmes): California Department Fish and Game, Inland Fisheries Branch. Special Publication 81-1. 27 p. February 1981.

Hecht, B., Sequential Changes in Physical Conditions Affecting Aquatic Habitat in the Upper Carmel River, California, Following the Marble-Cone Fire of August, 1977: Proceedings of the California Riparian symposium, September 1981, pp.124-133.

Hecht, B., Substrate Enhancement/Sediment Management Study, Lagunitas Creek, Marin County -- Phase IIIa: Sediment Transport and Bed Conditions, 1980 - 1981. H. Esmaili & Associates, Inc. Report prepared for Marin Municipal Water District. 92 p. November, 1981.

Hecht, B., Substrate Enhancement/Sediment Management Study, Lagunitas Creek, Marin County -- Phase IIIb: Sediment Transport and Bed Conditions, 1979 - 1982. Report to the Marin Municipal Water District. 172 p. April 1983.

Hecht, B. Efficacy of Bank Protection Proposals for Selected Locations in the San Geronimo Valley. Memo to Dana Roxón and Don Kelley. 5 p. March 29, 1988.

Hecht, B. and R. Enkeboll, Substrate Enhancement/Sediment Management Study, Lagunitas Creek, Marin County -- Phase I: Sediment Control Alternatives, H. Esmaili & Associates, Inc., Report to the Marin Municipal Water District, 44 p. October 1979.

Hecht, B., R. Enkeboll, and G. Muehleck, Substrate Enhancement/Sediment Management Study for Lagunitas Creek, Marin County -- Phase II: Sediment Transport and Substrate Conditions, 1979 - 1980. H. Esmaili & Associates, Inc. Report to the Marin Municipal Water District, 91 p. September 1980.

Hecht, B. and M.R. Woysner, Restoration of Normal Bed Conditions following the Storm of January 4, 1982 In Corralitos and Browns Creeks, Santa Cruz County, California: Paper Presented at the 18th Annual Geomorphology "Binghampton" Symposium, Oxford, OH, 1987. In Press.

Kelley, D. W., Proposed Investigations on Lagunitas Creek Relevant to the Enlargement of Kent Reservoir: Memorandum to Marin Municipal Water District, 10 p. October 8, 1982.

Kelley, D.W. and D.H. Dettman, Relationships Between Streamflow, Rearing Habitat, Substrate Conditions and Juvenile Steelhead Populations in Lagunitas Creek, Marin County, 1979. D. W. Kelley, Aquatic Biologist. Report to the Marin Municipal Water District, 23 p. February 1980.

Li, S.K., Survey of the California Freshwater Shrimp, Syncaris pacifica, In Lagunitas Creek, Marin County, California: D.W. Kelley & Associates report to the Marin Municipal Water District, 15 p. August 1981.

Lisle, T. E., Effects of Aggradation and Degradation On Riffle-Pool Morphology In Natural Gravel Channels, Northwestern California: Water Resources Research, v. 18, no. 6, pp. 1643 - 1651. December 1982.

Nolan, K.M., D.C. Marron, and L.M. Collins, Stream-Channel Response to the January 3-5, 1982, Storm In the Santa Cruz Mountains, West Central California: U.S. Geological Survey Open-File Report, October 1983 draft, 54 p.

Parker, G. and P.C. Klingeman, On Why Gravel Stream Beds Are Paved: Water Resources Research, v. 18, no. 5, pp. 1409-1423. October 1982.

Ritter, J.R. and W. M. Brown, II., Turbidity and Suspended Sediment Transport in the Russian River Basin, California: U.S. Geological Survey Open-File Report, October 1, 1971, 100 p.

Wolman, M.G., A Method For Sampling Coarse River-Bed Material. Trans. Am. Geophys. Union v. 35, no. 6. pp. 951-956. 1954.

Appendices

- 1. Description of computer modeling runs to date.**
- 2. Relations of bedload-sediment transport to streamflow used in accumulation/depletion modeling.**
- 3. Annual and cumulative discharge of water and bedload, by station.**
- 4. Annual accumulation/depletion of bedload sediment in State Park Reach, Lagunitas Creek**
- 5. Relation of bed descriptors to observed sediment accumulation and depletion, Lagunitas Creek**
 - 5a. Glides**
 - 5b. Pools**
 - 5c. Riffles**

Appendix 1

Computer Modeling Runs to Date

Computer Modeling Runs To Date**Run Number Hydrologic and Bedload Sediment Transport Regime**

- | | |
|---|--|
| 1 | Enlarged Dam Hydrology, Normal Transport Rates. |
| 2 | Corrected Enlarged Dam Hydrology,
Normal Transport Rates. |
| 3 | Recorrected Enlarged Dam Hydrology,
Normal Transport Rates. |
| 4 | Enlarged Dam Hydrology (from Run 3),

Normal and Worst Case (disturbed) Transport Rates. |
| 5 | Enlarged Dam and Old Dam Hydrology,
Normal and Worst Case Transport Rates,
Episodic Adjustment Program Used. |
| 6 | Corrected Enlarged Dam and Old Dam Hydrology,
Normal and Worst Case Transport Rules. |
| 7 | Enlarged Dam Hydrology 75, 50, and 25 percent
Transport from San Geronimo Creek (K4).
Normal Transport Rates at K8 |

Appendix 2

Relations of Bedload-Sediment Transport to Streamflow Used In Accumulation/Depletion Modeling

Appendix 2. Relation of Bedload Sediment to Water Discharge

Stream & Station	Bedload Transport Conditions	Relation ^{a/}	Range	N ^{b/}	R ^{2c/}	Remarks
San Geronimo Creek at Lagunitas Rd. (K4)	current transport rate assumed normal	$Tb = 8.0 \times 10^{-5} Q^{2.33}$	-	43	.83	best fit, least squares method
	twice normal transport rate	$Tb = 1.6 \times 10^{-4} Q^{2.33}$	-	-	-	based on normal transport curve
	75% normal transport rate	$Tb = 6.0 \times 10^{-5} Q^{2.33}$	-	-	-	based on normal transport curve
	50% normal transport rate	$Tb = 4.0 \times 10^{-5} Q^{2.33}$	-	-	-	based on normal transport curve
	25% normal transport rate	$Tb = 2.0 \times 10^{-5} Q^{2.33}$	-	-	-	based on normal transport curve
Lagunitas Creek at Samuel P. Taylor State Park (K6)	current transport rate, assumed normal	$Tb = 8.0 \times 10^{-4} Q^{1.54}$	Q < 500 cfs	22	-	eye fit
		$Tb = 1.9 \times 10^{-7} Q^{2.942}$	Q > 500 cfs	18	.69	best fit, least squares method
Lagunitas Creek at Tocaloma (K8)	current transport rate, assumed normal	$Tb = 1.25 \times 10^{-3} Q^{1.54}$	Q < 88 cfs	22	-	eye fit
		$Tb = 1.80 \times 10^{-7} Q^{2.96}$	Q > 88 cfs	22	-	eye fit

Footnotes:

a/ Whole-channel instantaneous bedload transport rate in tons/day (Tb) expressed as a function of instantaneous streamflow (Q) in cfs

b/ Number of paired observations used to establish relationship

c/ Correlation coefficient, expressed as R²

Appendix 3

Annual and Cumulative Discharge of Water and Bedload by Station and Year

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
IN LAGUNITAS CREEK AT TOLALOMA (K8)
NORMAL BEDLOAD TRANSPORT RATES
(LARGE DAM)**

STATION	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
KB.55	14412.	14412.	.00	.00	117.02	117.02
KB.56	80587.	94998.	.00	.00	11447.03	11564.05
KB.57	19838.	114836.	.00	.00	237.47	11801.52
KB.58	134332.	249168.	.00	.00	30077.29	41878.81
KB.59	12347.	261516.	.00	.00	139.87	42018.68
KB.60	21165.	282681.	.00	.00	1024.45	43043.13
KB.61	13676.	296357.	.00	.00	125.68	43168.80
KB.62	20607.	316964.	.00	.00	828.11	43996.91
KB.63	40472.	357435.	.00	.00	2353.82	46350.73
KB.64	11929.	369364.	.00	.00	86.79	46437.53
KB.65	31111.	400475.	.00	.00	936.56	47374.09
KB.66	21529.	422004.	.00	.00	2012.70	49386.79
KB.67	107486.	529490.	.00	.00	39886.95	89273.73
KB.68	16910.	546400.	.00	.00	159.04	89432.77
KB.69	62352.	608752.	.00	.00	2707.01	92139.79
KB.70	74819.	683570.	.00	.00	34254.23	126394.00
KB.71	29667.	713238.	.00	.00	1582.87	127976.90
KB.72	10743.	723980.	.00	.00	82.83	128059.70
KB.73	98781.	822761.	.00	.00	22797.88	150857.60
KB.74	141233.	963994.	.00	.00	18028.45	168886.10
KB.75	27870.	991864.	.00	.00	949.57	169835.60
KB.76	7816.	999680.	.00	.00	27.10	169862.70
KB.77	3612.	1003292.	.00	.00	12.85	169875.60
KB.78	40409.	1043701.	.00	.00	734.29	170609.90
KB.79	17975.	1061676.	.00	.00	313.95	170923.80
KB.80	37783.	1099459.	.00	.00	1158.50	172082.30
KB.81	12256.	1111715.	.00	.00	139.77	172222.10
KB.82	92825.	1204540.	.00	.00	10534.29	182756.40
KB.83	115983.	1320523.	.00	.00	27040.92	209797.30
KB.84	44975.	1365498.	.00	.00	1999.05	211796.40

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
FROM SAN GERONIMO CREEK (K4).
NORMAL BEDLOAD TRANSPORT RATES**

STATION AND YEAR	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
K4.55	4040.	4040.	.00	.00	68.69	68.69
K4.56	26893.	30933.	.00	.00	9991.11	10059.80
K4.57	6959.	37892.	.00	.00	181.01	10240.81
K4.58	28331.	66223.	.00	.00	5524.25	15765.05
K4.59	3492.	69715.	.00	.00	147.54	15912.60
K4.60	8742.	78456.	.00	.00	1461.86	17374.46
K4.61	4378.	82834.	.00	.00	67.27	17441.73
K4.62	8317.	91152.	.00	.00	1260.30	18702.04
K4.63	15499.	106650.	.00	.00	3327.05	22029.09
K4.64	2987.	109638.	.00	.00	38.85	22067.93
K4.65	12571.	122209.	.00	.00	1340.51	23408.45
K4.66	8581.	130789.	.00	.00	2922.67	26331.11
K4.67	29178.	159968.	.00	.00	24404.62	50735.73
K4.68	5234.	165201.	.00	.00	89.74	50825.47
K4.69	20951.	186152.	.00	.00	2878.01	53703.48
K4.70	27606.	213759.	.00	.00	18181.89	71885.38
K4.71	11760.	225519.	.00	.00	1904.52	73789.89
K4.72	2929.	228448.	.00	.00	56.97	73846.86
K4.73	31657.	260104.	.00	.00	15485.00	89331.86
K4.74	28891.	288995.	.00	.00	3323.88	92655.73
K4.75	10943.	299939.	.00	.00	1467.81	94123.55
K4.76	1398.	301337.	.00	.00	3.39	94126.94
K4.77	656.	301993.	.00	.00	3.41	94130.35
K4.78	17032.	319025.	.00	.00	795.28	94925.63
K4.79	6258.	325284.	.00	.00	380.33	95305.96
K4.80	14360.	339644.	.00	.00	1601.21	96907.17
K4.81	3664.	343308.	.00	.00	160.88	97068.05
K4.82	28566.	371874.	.00	.00	11534.70	108602.80
K4.83	32889.	404764.	.00	.00	7114.48	115717.20
K4.84	14846.	419610.	.00	.00	1611.80	117329.00

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
FROM SAN GERONIMO CREEK (K4).
75% OF NORMAL BEDLOAD TRANSPORT RATES**

STATION AND YEAR	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
K4.55	4040.	4040.	.00	.00	51.52	51.52
K4.56	26893.	30933.	.00	.00	7493.32	7544.84
K4.57	6959.	37892.	.00	.00	135.76	7680.59
K4.58	28331.	66223.	.00	.00	4143.19	11823.78
K4.59	3492.	69715.	.00	.00	110.66	11934.44
K4.60	8742.	78456.	.00	.00	1096.39	13030.83
K4.61	4378.	82834.	.00	.00	50.46	13081.29
K4.62	8317.	91152.	.00	.00	945.23	14026.52
K4.63	15499.	106650.	.00	.00	2495.29	16521.81
K4.64	2987.	109638.	.00	.00	29.13	16550.94
K4.65	12571.	122209.	.00	.00	1005.38	17556.33
K4.66	8581.	130789.	.00	.00	2192.00	19748.33
K4.67	29178.	159968.	.00	.00	18303.44	38051.77
K4.68	5234.	165201.	.00	.00	67.30	38119.07
K4.69	20951.	186152.	.00	.00	2158.51	40277.57
K4.70	27606.	213759.	.00	.00	13636.42	53913.99
K4.71	11760.	225519.	.00	.00	1428.39	55342.38
K4.72	2929.	228448.	.00	.00	42.73	55385.11
K4.73	31657.	260104.	.00	.00	11613.76	66998.87
K4.74	28891.	288995.	.00	.00	2492.91	69491.77
K4.75	10943.	299939.	.00	.00	1100.86	70592.63
K4.76	1398.	301337.	.00	.00	2.54	70595.17
K4.77	656.	301993.	.00	.00	2.56	70597.73
K4.78	17032.	319025.	.00	.00	596.46	71194.19
K4.79	6258.	325284.	.00	.00	285.24	71479.43
K4.80	14360.	339644.	.00	.00	1200.91	72680.34
K4.81	3664.	343308.	.00	.00	120.66	72800.99
K4.82	28566.	371874.	.00	.00	8651.02	81452.02
K4.83	32889.	404764.	.00	.00	5335.87	86787.88
K4.84	14846.	419610.	.00	.00	1208.85	87996.73

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
FROM SAN GERONIMO CREEK (K4).
50% OF NORMAL BEDLOAD TRANSPORT RATES**

STATION AND YEAR	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
K4.55	4040.	4040.	.00	.00	34.34	34.34
K4.56	26893.	30933.	.00	.00	4995.57	5029.91
K4.57	6959.	37892.	.00	.00	90.51	5120.42
K4.58	28331.	66223.	.00	.00	2762.12	7882.54
K4.59	3492.	69715.	.00	.00	73.77	7956.31
K4.60	8742.	78456.	.00	.00	730.93	8687.24
K4.61	4378.	82834.	.00	.00	33.64	8720.88
K4.62	8317.	91152.	.00	.00	630.15	9351.03
K4.63	15499.	106650.	.00	.00	1663.53	11014.55
K4.64	2987.	109638.	.00	.00	19.42	11033.98
K4.65	12571.	122209.	.00	.00	670.26	11704.23
K4.66	8581.	130789.	.00	.00	1461.33	13165.57
K4.67	29178.	159968.	.00	.00	12202.29	25367.86
K4.68	5234.	165201.	.00	.00	44.87	25412.73
K4.69	20951.	186152.	.00	.00	1439.01	26851.73
K4.70	27606.	213759.	.00	.00	9090.92	35942.66
K4.71	11760.	225519.	.00	.00	952.26	36894.91
K4.72	2929.	228448.	.00	.00	28.48	36923.40
K4.73	31657.	260104.	.00	.00	7742.51	44665.91
K4.74	28891.	288995.	.00	.00	1661.94	46327.84
K4.75	10943.	299939.	.00	.00	733.91	47061.75
K4.76	1398.	301337.	.00	.00	1.69	47063.45
K4.77	656.	301993.	.00	.00	1.71	47065.15
K4.78	17032.	319025.	.00	.00	397.64	47462.79
K4.79	6258.	325284.	.00	.00	190.16	47652.95
K4.80	14360.	339644.	.00	.00	800.61	48453.56
K4.81	3664.	343308.	.00	.00	80.44	48534.00
K4.82	28566.	371874.	.00	.00	5767.34	54301.34
K4.83	32889.	404764.	.00	.00	3557.25	57858.59
K4.84	14646.	419610.	.00	.00	805.90	58664.49

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
FROM SAN GERONIMO CREEK (K4).
25% OF NORMAL BEDLOAD TRANSPORT RATES**

STATION AND YEAR	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
K4.55	4040.	4040.	.00	.00	17.17	17.17
K4.56	26893.	30933.	.00	.00	2497.76	2514.93
K4.57	6959.	37892.	.00	.00	45.27	2560.21
K4.58	28331.	66223.	.00	.00	1381.07	3941.28
K4.59	3492.	69715.	.00	.00	36.87	3978.15
K4.60	8742.	78456.	.00	.00	365.48	4343.63
K4.61	4378.	82834.	.00	.00	16.81	4360.44
K4.62	8317.	91152.	.00	.00	315.07	4675.51
K4.63	15499.	106650.	.00	.00	831.75	5507.26
K4.64	2987.	109638.	.00	.00	9.71	5516.97
K4.65	12571.	122209.	.00	.00	335.09	5852.06
K4.66	8581.	130789.	.00	.00	730.67	6582.73
K4.67	29178.	159968.	.00	.00	6101.13	12683.86
K4.68	5234.	165201.	.00	.00	22.43	12706.28
K4.69	20951.	186152.	.00	.00	719.46	13425.74
K4.70	27606.	213759.	.00	.00	4545.46	17971.21
K4.71	11760.	225519.	.00	.00	476.12	18447.32
K4.72	2929.	228448.	.00	.00	14.24	18461.56
K4.73	31657.	260104.	.00	.00	3871.28	22332.84
K4.74	28891.	288995.	.00	.00	830.96	23163.80
K4.75	10943.	299939.	.00	.00	366.95	23530.74
K4.76	1398.	301337.	.00	.00	.85	23531.59
K4.77	656.	301993.	.00	.00	.86	23532.45
K4.78	17032.	319025.	.00	.00	198.84	23731.29
K4.79	6258.	325284.	.00	.00	95.10	23826.39
K4.80	14360.	339644.	.00	.00	400.31	24226.71
K4.81	3664.	343308.	.00	.00	40.21	24266.91
K4.82	28566.	371874.	.00	.00	2883.70	27150.61
K4.83	32889.	404764.	.00	.00	1778.60	28929.22
K4.84	14846.	419610.	.00	.00	402.94	29332.16

**ANNUAL DISCHARGE OF WATER AND SEDIMENT
FROM SAN GERONIMO CREEK (K4).
200% OF NORMAL BEDLOAD TRANSPORT RATES**

STATION AND YEAR	STREAMFLOW (ac. ft.)	CUMULATIVE STREAMFLOW (ac. ft.)	SUSPENDED SEDIMENT (tons)	CUMULATIVE SUSPENDED SEDIMENT (tons)	BEDLOAD SEDIMENT (tons)	CUMULATIVE BEDLOAD SEDIMENT (tons)
K1.55	4040.	4040.	.00	.00	137.38	137.38
K4.56	26893.	30933.	.00	.00	19982.21	20119.59
K4.57	6959.	37892.	.00	.00	362.02	20481.61
K4.58	28331.	66223.	.00	.00	11048.50	31530.11
K4.59	3492.	69715.	.00	.00	295.09	31825.20
K4.60	8742.	78456.	.00	.00	2923.71	34748.91
K4.61	4378.	82834.	.00	.00	134.55	34883.46
K4.62	8317.	91152.	.00	.00	2520.61	37404.06
K4.63	15499.	106650.	.00	.00	6654.11	44058.18
K4.64	2987.	109638.	.00	.00	77.69	44135.87
K4.65	12571.	122209.	.00	.00	2681.03	46816.90
K4.66	8581.	130789.	.00	.00	5845.32	52662.22
K4.67	29178.	159968.	.00	.00	48809.09	101471.30
K4.68	5234.	165201.	.00	.00	179.47	101650.80
K4.69	20951.	186152.	.00	.00	5756.02	107406.80
K4.70	27606.	213759.	.00	.00	36363.79	143770.60
K4.71	11760.	225519.	.00	.00	3809.03	147579.60
K4.72	2929.	228448.	.00	.00	113.94	147693.60
K4.73	31657.	260104.	.00	.00	30970.01	178663.60
K4.74	28891.	288995.	.00	.00	6647.75	185311.30
K4.75	10943.	299939.	.00	.00	2935.63	188246.90
K4.76	1398.	301337.	.00	.00	6.77	188253.70
K4.77	656.	301993.	.00	.00	6.82	188260.50
K4.78	17032.	319025.	.00	.00	1590.56	189851.10
K4.79	6258.	325284.	.00	.00	760.65	190611.80
K4.80	14360.	339644.	.00	.00	3202.43	193814.20
K4.81	3664.	343308.	.00	.00	321.76	194135.90
K4.82	28566.	371874.	.00	.00	23069.39	217205.30
K4.83	32889.	404764.	.00	.00	14228.97	231434.30
K4.84	14846.	419610.	.00	.00	3223.60	234657.90

**ANNUAL SPILLS AND RELEASES
FROM ENLARGED KENT LAKE**

YEAR	ANNUAL DISCHARGE (ac. ft.)	CUMULATIVE DISCHARGE (ac. ft)
K5.55	3907.64	3907.64
K5.56	29119.14	33026.78
K5.57	2877.42	35904.20
K5.58	77372.02	113276.20
K5.59	3778.11	117054.30
K5.60	2110.61	119164.90
K5.61	2497.00	121661.90
K5.62	2532.49	124194.40
K5.63	8066.38	132260.80
K5.64	3994.51	136255.30
K5.65	3378.45	139633.80
K5.66	3218.98	142852.80
K5.67	53970.84	196823.60
K5.68	3805.49	200629.10
K5.69	19547.52	220176.60
K5.70	26363.89	246540.50
K5.71	4389.42	250929.90
K5.72	2846.68	253776.60
K5.73	39040.32	292816.90
K5.74	81783.58	374600.50
K5.75	4249.39	378849.90
K5.76	3478.81	382328.70
K5.77	1474.72	383803.40
K5.78	2619.57	386423.00
K5.79	3129.13	389552.10
K5.80	6660.08	396212.20
K5.81	3206.87	399419.10
K5.82	36795.52	436214.60
K5.83	50954.20	487168.80
K5.84	13133.71	500302.50

Appendix 4

**Annual Accumulation/Depletion of Bedload Sediment
Within the State Park Reach of Lagunitas Creek**

ANNUAL ACCUMULATION AND DEPLETION
OF BED SEDIMENT IN LAGUNITAS CREEK
FROM SAN GERONIMO ROAD BRIDGE (K4) TO TOLALOMA BRIDGE (K8)
(LARGE DAM)

200% BEDLOAD CONTRIBUTION FROM SAN GERONIMO CREEK				NORMAL BEDLOAD CONTRIBUTION FROM SAN GERONIMO CREEK				75% BEDLOAD CONTRIBUTION FROM SAN GERONIMO CREEK				50% BEDLOAD CONTRIBUTION FROM SAN GERONIMO CREEK				25% BEDLOAD CONTRIBUTION FROM SAN GERONIMO CREEK			
YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)	OR FILL (feet)	YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)	OR FILL (feet)	YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)	OR FILL (feet)	YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)	OR FILL (feet)	YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)	OR FILL (feet)
55	.0042	.0042	.0023	55	.0018	.0018	.0018	55	.0013	.0013	.0013	55	.0013	.0013	.0013	55	.0008	.0008	.0008
56	.4036	.4077	.1227	56	.0525	.0543	.0543	56	.0525	.0543	.0543	56	.0525	.0543	.0543	56	.0879	.0879	.0879
57	.0088	.4166	.0037	57	.0037	.1260	.0567	57	.0025	.0567	.0567	57	.0012	.0152	.0152	57	.0001	.0872	.0872
58	.1081	.3085	.2634	58	.0041	.1347	.2455	58	.0031	.2455	.2455	58	.0021	.3563	.3563	58	.3798	.4670	.4670
59	.0083	.3168	.0041	59	.0041	.1388	.2496	59	.0031	.2496	.2496	59	.0021	.3584	.3584	59	.0010	.4680	.4680
60	.0698	.3866	.0287	60	.0287	.1675	.2783	60	.0185	.2681	.2681	60	.0082	.3666	.3666	60	.0021	.4681	.4681
61	.0040	.3906	.0021	61	.0021	.1696	.2804	61	.0016	.2697	.2697	61	.0014	.3680	.3680	61	.0007	.4674	.4674
62	.0612	.4518	.0258	62	.0258	.1954	.3062	62	.0169	.2866	.2866	62	.0081	.3761	.3761	62	.0008	.4682	.4682
63	.1561	.6079	.0626	63	.0626	.2580	.3688	63	.0392	.3272	.3272	63	.0158	.3919	.3919	63	.0076	.4758	.4758
64	.0029	.6108	.0018	64	.0018	.2598	.3706	64	.0016	.3288	.3288	64	.0013	.3932	.3932	64	.0010	.4747	.4747
65	.0642	.6750	.0265	65	.0265	.2863	.3971	65	.0171	.3459	.3459	65	.0077	.4009	.4009	65	.0017	.4765	.4765
66	.1381	.8131	.0560	66	.0560	.3423	.4583	66	.0354	.3813	.3813	66	.0149	.4158	.4158	66	.0057	.4821	.4821
67	.8161	1.6293	.1301	67	.1301	.4724	.6025	67	.0414	.4227	.4227	67	.0219	.4377	.4377	67	.3843	.8665	.8665
68	.0048	1.6341	.0023	68	.0023	.4747	.6048	68	.0016	.4243	.4243	68	.0010	.4387	.4387	68	.0004	.8661	.8661
69	.1259	1.7600	.0450	69	.0450	.5197	.6647	69	.0248	.4491	.4491	69	.0046	.4433	.4433	69	.0157	.8818	.8818
70	.5451	2.3051	.0340	70	.0340	.5537	.6887	70	.0938	.5430	.5430	70	.0215	.4648	.4648	70	.3493	1.2311	1.2311
71	.0869	2.3919	.0334	71	.0334	.5871	.7211	71	.0200	.5630	.5630	71	.0066	.4714	.4714	71	.0068	1.2379	1.2379
72	.0040	2.3960	.0024	72	.0024	.5895	.7235	72	.0020	.5650	.5650	72	.0016	.4730	.4730	72	.0012	1.2367	1.2367
73	.5537	2.9496	.1184	73	.1184	.7079	.8263	73	.0096	.5746	.5746	73	.0092	.4822	.4822	73	.2080	1.4447	1.4447
74	.0633	2.8863	.1567	74	.1567	.8646	.9810	74	.1801	.7627	.7627	74	.2034	.6856	.6856	74	.2268	1.6715	1.6715
75	.0712	2.9575	.0299	75	.0299	.8945	.9810	75	.0196	.7823	.7823	75	.0093	.6949	.6949	75	.0010	1.6725	1.6725
76	.0018	2.9593	.0017	76	.0017	.8962	.9827	76	.0017	.7840	.7840	76	.0016	.6965	.6965	76	.0016	1.6709	1.6709
77	.0020	2.9613	.0019	77	.0019	.8981	.9846	77	.0018	.7858	.7858	77	.0018	.6983	.6983	77	.0018	1.6691	1.6691
78	.0364	3.0164	.0140	78	.0140	.9121	.9986	78	.0085	.7943	.7943	78	.0029	.7012	.7012	78	.0027	1.6718	1.6718
79	.0189	3.0164	.0083	79	.0083	.9204	.9994	79	.0056	.8000	.8000	79	.0029	.7041	.7041	79	.0002	1.6716	1.6716
80	.0758	3.0924	.0308	80	.0308	.9512	.9994	80	.0195	.8195	.8195	80	.0083	.7128	.7128	80	.0030	1.6746	1.6746
81	.0090	3.1014	.0045	81	.0045	.9557	.9999	81	.0034	.8229	.8229	81	.0023	.7151	.7151	81	.0011	1.6724	1.6724
82	.5031	3.6045	.1789	82	.1789	.9736	.9999	82	.0978	.9207	.9207	82	.0168	.7319	.7319	82	.0643	1.7377	1.7377
83	.0238	3.6283	.1762	83	.1762	.9914	.9999	83	.2262	.9476	.9476	83	.2762	1.2508	1.2508	83	.3262	2.0639	2.0639
84	.0646	3.6929	.0193	84	.0193	.9933	.9999	84	.0080	.9556	.9556	84	.0033	1.2541	1.2541	84	.0147	2.0786	2.0786

**ANNUAL ACCUMULATION AND DEPLETION
OF BED SEDIMENT IN LAGUNITAS CREEK
FROM SHAFTER BRIDGE TO TOLALOMA BRIDGE (K8)**

Comparison of Old and New Dam
Normal Bedload Delivery, San Geronimo Creek

**BEST FIT
OLD DAM**

YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)
55	.0024	.0024
56	.0329	.0354
57	.0039	.0392
58	-.4151	-.3758
59	.0043	-.3716
60	.0222	-.3494
61	.0022	-.3472
62	.0259	-.3212
63	.0379	-.2833
64	.0020	-.2813
65	.0022	-.2791
66	.0523	-.2268
67	-.7183	-.9451
68	.0011	-.9441
69	-.0506	-.9946
70	-.3443	-1.3390
71	.0289	-1.3100
72	.0025	-1.3075
73	-.2943	-1.6019
74	-.1826	-1.7844
75	-.0299	-1.8143
76	.0018	-1.8125
77	.0019	-1.8106
78	.0096	-1.8010
79	.0084	-1.7926
80	.0101	-1.7825
81	.0046	-1.7779
82	-.1560	-1.9338
83	-.1972	-2.1310
84	-.0269	-2.1580

**BEST FIT
ENLARGED DAM**

YEAR	SCOUR OR FILL (feet)	CUMULATIVE SCOUR OR FILL (feet)
55	.0023	.0023
56	.1227	.1250
57	.0037	.1287
58	-.2634	-.1347
59	.0041	-.1305
60	.0287	-.1018
61	.0021	-.0997
62	.0258	-.0739
63	.0626	-.0113
64	.0018	-.0095
65	.0265	.0170
66	.0560	.0730
67	.1301	.2031
68	.0023	.2054
69	.0450	.2504
70	.0340	.2844
71	.0334	.3178
72	.0024	.3202
73	.1184	.4386
74	-.1567	.2818
75	.0299	.3118
76	.0017	.3135
77	.0019	.3153
78	.0140	.3294
79	.0083	.3376
80	.0308	.3684
81	.0045	.3729
82	.1789	.5518
83	-.1762	.3756
84	.0193	.3949

Appendix 5

**Relation of Bed Descriptors to Observed
Accumulation and Depletion, Lagunitas Creek**

- A. Glides**
- B. Pools**
- C. Riffles**

Figure 5a. Relation of Bed Descriptors to Observed Sediment Accumulation and Depletion in Glides of Lagunitas Creek.

Code ^{a/}	Location ^{b/}	Date ^{c/}	Accumulation Depletion ^{d/}	Mean Embeddedness ^{e/}	Cobble Abundance ^{f/}	Fines Abundance ^{g/}	Median Particle Size of Bed Material	
							Bulk Sediment In Pools ^{h/} (mm)	Bed-Surface Material ^{i/} (mm)
KG	At Shafter ^{j/}	801201		0.40	0.40	0.08	12.98	47.1
		810223	+ 0.430	0.36	0.13	0.45	1.84	18.3
		810727	+ 0.015	0.30	0.05	0.25	3.36	16.0
		821005	+ 0.110	0.40	0.03	0.16	6.38	18.4
KB	Below Shafter	Feb '80		-	-	-	-	-
		810223	- 0.042	0.42	0.42	0.04	6.26	37.5
		810724	- 0.012	0.39	0.29	0.13	4.20	32.0
		820730	+ 0.512	0.25	0.48	0.10	23.14	43.8
KH	Kellery's Upper State Park Site	801201		0.51	0.40	0.07	15.95	23.8
		810223	+ 0.010	0.36	0.28	0.09	23.23	29.1
		810728	+ 0.014	0.32	0.22	0.03	25.41	23.3
		820723	+ 0.086	0.31	0.35	0.03	11.73	33.7
KC	Campground Bridge	801216		0.35	0.36	0.04	-	35.1
		810227	+ 0.03	0.21	0.35	0.03	23.32	32.0
		810724	- 0.01	0.18	0.40	0.01	10.83	36.1
		820709	+ 0.273	0.30	0.48	0.06	14.96	41.3
KJ	Big Rock	801212		0.33	0.15	0.04	21.37	23.0
		810223	+ 0.006	0.41	0.06	0.11	13.65	17.4
		810729	+ 0.021	0.30	0.08	0.01	15.75	20.4
		820805	+ 0.219	0.16	0.16	0.01	9.11	24.2
KD	Big Bend	801216		0.30	0.43	0.01	12.38	101.8
		810223	+ 0.037	0.43	0.33	0.11	16.34	78.4
		810729	+ 0.037	0.19	0.27	0.17	15.08	62.6
		820915		0.28	0.38	0.07	14.05	97.6
KL	Chico Ranch Cr.	790830		0.49				
		801212		0.50	0.01	0.35	5.59	16.0
		810224	+ 0.132	0.30	0.02	0.23	8.89	17.2
		810803	+ 0.026	0.30	0.02	0.04	8.45	17.4
		820730	- 0.380 ^{k/}	0.33	0.04	0.16	5.12	16.3
KF	Kellery's Toolcans	801216		0.05	0.09	0.06	15.33	18.1
		810224 ^{l/}	+ 0.053	0.30	0.10	0.01	5.64	18.4
		810812	0.0	0.29	0.10	0.02	14.56	17
		820721	- 0.047	0.70	0.05	0.03	10.67	24.3

a/ Location shown on Figure 4

b/ Informal designations used throughout sediment study and by Bretovich and Kellery (1987)

c/ Year-month-day notation

d/ Observed net accumulation (+) and depletion (-) for a glide at the bed-measuring site used in 1979 to 1982

e/ Proportion of a substrate's depth to which it is embedded in stream floor material

f/ Proportion of bed covered by cobbles, as measured from sampling a grid of interlocking tapes, covering all areas of the stream bed within a given glide

g/ Proportion of bed covered by material finer than 4 mm. (sand, silt, clay) within a given glide measured as described in previous footnote

h/ Median particle size of bed material sampled with a 15-mm sorting device, device approximately 15 cm into the bed, next the surface layer of the bed has been removed. sample taken at the lower end of glide, near the upper end of glide

i/ Median particle size of the bed-surface sediments (or "surface layer"), within the glide sampled as described in footnote f

j/ Site KG is at Shafter, where the stream rapidly deposits and accumulates sediment discharged by San Geronimo Creek. It is considered a special case, not comparable to other bed-measuring sites

k/ Major logjam formed in pool above during storm of January 4, 1982

l/ Major logjam failure at site upstream during last preceding storm period



Table 5b. Relation of Bed Descriptors to Observed Sediment Accumulation and Depletion in Pools of Lagunitas Creek.

Code ^{a/}	Location ^{b/}	Date ^{c/}	Accumulation Depletion ^{d/}	Mean Embeddedness ^{e/}	Cobble Abundance ^{f/}	Fines Abundance ^{g/}	Median Particle Sizes of Bed Material	
							Bulk Sediment In Pools ^{h/} (mm)	Bed-Surface Material ^{i/} (mm)
KG	At Shafter ^{j/}	801201		0.30	0.41	0.07	12.98	62.0
		810223	+ 0.254	0.32	0.08	0.63	1.84	25.2
		810727	+0.264	0.30	0.05	0.25	3.26	47.0
		821005	- 0.304	0.37	0.21	0.18	6.38	99.4
KB	Below Shafter	Feb '80						
		810223	- 0.033	0.42	0.42	0.04	6.26	30.4
		810724	+ 0.050	0.39	0.29	0.15	4.20	52.9
		820730	+0.441	0.25	0.48	0.10	23.14	31.1
KH	Kellie's Upper State Park Site	801201		0.39	0.42	0.12	15.95	49.8
		810223	- 0.046	0.42	0.34	0.21	23.23	37.0
		810728	+ 0.003	0.40	0.22	0.07	25.41	25.3
		820723	0.301	0.22	0.28	0.01	11.73	20.6
KC	Compywood Bridge	801216		0.33	0.56	0.07	-	37.2
		810227	+ 0.085	0.32	0.35	0.02	23.32	32.3
		810724	- 0.046	0.21	0.39	0.03	10.83	37.7
		820709	+ 0.337	0.24	0.53	0.08	14.96	49.0
KJ	Big Rock	801212		0.30	0.05	0.12	21.37	16.5
		810225	+ 0.004	0.27	0.02	0.32	13.65	18.2
		810729	- 0.076	0.11	0.05	0.30	15.75	16.3
		820805	+ 0.526	0.19	0.14	0.03	9.11	17.2
KD	Big Bend	801216		0.22	0.62	0.01	12.38	63.0
		810223	- 0.004	0.35	0.45	0.11	16.34	47.8
		810729	+ 0.057	0.26	0.38	0.04	15.08	36.6
		820915	n.d.	0.19	0.56	0.14	14.05	59.3
KL	Chico Ranch Cr	801212		0.19	.08	0.36	5.59	23.1
		810224	- 0.135	0.22	.07	0.26	8.99	17.4
		810803	+0.034	0.35	.09	0.19	8.45	20.4
		820730	- 0.279	-	-	-	5.12	-
KF	Kellie's Tunnies	801216		0.30	0.28	0.31	15.33	30.7
		810224	+ 0.130	0.30	0.32	0.07	5.84	23.7
		810812	- 0.040	0.25	0.30	0.04	14.56	24.9
		820721	-0.090	0.46	0.42	0.15	10.67	35.2

a/ Location shown on Figure 4

b/ Informal designations used throughout sediment study and by Brauer and Kellie (1987)

c/ Year/month/day notation

d/ Observed net accumulation (+) and depletion (-) for a pool at the bed-measuring site used in 1979 to 1982

e/ Proportion of a cobble's depth to which it is embedded in stream floor material

f/ Proportion of bed covered by cobbles, as measured from sampling a grid of intersecting tapes, covering all areas of the active bed within a given pool

g/ Proportion of bed covered by material finer than 4 mm. (sand, silt, clay) within a given pool measured as described in previous footnote

h/ Median particle size of bed material sampled with a 15-cm sump device, driven approximately 15 cm into the bed, once the surface layer of the bed has been removed, samples taken at the lower end of pools, near the upper end of glides

i/ Median particle size of the bed-surface sediments (or "surface layer"), within the pool sampled as described in footnote h

j/ Site KG is at Shafter, where the stream emptying depletion and nonseasonal sediments discharged by San Geronimo Creek. It is considered a special case, not comparable to other bed-measuring sites



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Table 5c. Relation of Bed Descriptors To Observed Sediment Accumulation and Depletion in Riffles of Lagunitas Creek.

Code ^{a/}	Location ^{b/}	Date ^{c/}	Accumulation Depletion ^{d/}	Mean Embeddness ^{e/}	Cobble Abundance ^{f/}	Pines Abundance ^{g/}	Median Particle Sizes of Bed Material	
							Bulk Sediment In Pools ^{h/} (mm)	Bed-Surface Material ^{i/} (mm)
EG	At Shafter	8D1201		0.34	0.57	0.05	12.98	42.0
		810223	+0.132	0.43	0.42	0.13	1.84	32.2
		810727	+0.036	0.27	0.40	0.14	2.36	47.0
		821028	+0.726	0.23	0.39	0.05	6.25	95.4
EG	Below Shafter	Feb '80						
		810223	-0.102	0.41	0.52	0.10	6.26	49.3
		810724	-0.017	0.25	0.47	0.20	4.20	89.1
		820720	+0.427	0.31	0.39	0.10	23.14	30.1
EG	Kellry's Upper Run Pool Site	790830		0.31				
		8D1201		0.35	0.61	0.04	15.95	60.3
		810223	-0.001	0.36	0.44	0.02	23.23	73.8
		810728	+0.001	0.31	0.59	0.05	25.41	72.5
EG	Campground Bridge	820720	+0.043	0.32	0.65	0.01	11.73	72.1
		820725		0.23	0.76	-	-	47.9
		820725	-0.011	0.21	0.53	-	-	37.1
		820726	-	0.31	0.57	0.02	-	38.1
EG	Campground Bridge	810227	-0.0301	0.34	0.54	0.02	23.32	49.2
		810724	+0.027	0.20	0.62	0	10.83	39.5
		820720	+0.241	0.32	0.47	0.01	14.96	41.5
EG	Big Rock	8D1212		0.33	0.50	0.02	21.37	45.0
		810223	+0.080	0.34	0.56	0.07	13.65	54.5
		810729	-0.020	0.11	0.30	0.05	13.75	53.8
		820802	+0.113	0.23	0.31	0.03	9.11	46.1
EG	Big Rock	8D1216		0.14	0.45	0.05	12.38	67.0
		810223	0.00	0.34	0.35	0.07	16.34	39.4
		810729	-0.220	0.16	0.57	0.03	15.08	58.5
		820915	W	0.19	0.58	0.07	14.05	61.3
EG	Chico Ranch Cr	Feb 80					2.59	-
		810224	+0.050	0.41	0.17	0.13	0.89	25.1
		810803	-0.846	0.33	0.23	0.04	0.43	28.9
EG	Kellry's Trench	820720		0.37	0.34	0.01	3.12	33.3
		8D1214		0.26	0.39	0.17	15.33	43.3
		810224	+0.12, 90W	0.28	0.47	0.06	5.84	46.4
		810722	+0.579	0.20	0.40	0.03	14.56	38.9
EG	Kellry's Trench	820721	+0.779	0.38	0.45	0.01	10.67	42.3

a/ Location shown on Figure 4

b/ Informal designations used throughout sediment study and by Benbow and Kellry (1987)

c/ Year/month/day notation

d/ Observed net accumulation (+) and depletion (-) for a riffle in the last-minimizing area used in 1979 to 1982

e/ Proportion of a riffle's depth to which it is embedded in reach flow material

f/ Proportion of bed covered by cobbles, as measured from sampling a grid of sedimentary tops, covering all areas of the entire bed within a given riffle

g/ Proportion of bed covered by pines from 4 mm. (round, ell. oval) within a given riffle measured as described in previous footnote

h/ Median particle size of bed material sampled with a 15-mm screen down, down approximately 15 cm from the bed, over the entire length of the bed has been measured, samples taken at the lower end of pool, near the upper end of gully

i/ Median particle size of the bed-surface sediments (or "surface layer"), within the riffle sampled as described in footnote f

j/ Note EG is at Shafter, where the stream rapidly deposits and accumulates discharged by San Geronimo Creek. It is considered a special case, not comparable sediment to other last-minimizing area

k/ Riffle is defined by only one cross-section; measurements derived by debris from during January 1982 event

l/ Left bank just below mouth laguna; runways sediment

m/ Laguna just upstream from during January 1981



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