WATERMASTERS
HOWARD H. HAILE
RICHARD A. RHONE
THOMAS M. STETSON

MAILING ADDRESS:
225 W. BROADWAY
SUITE 400
GLENDALE, CA 91204-1331

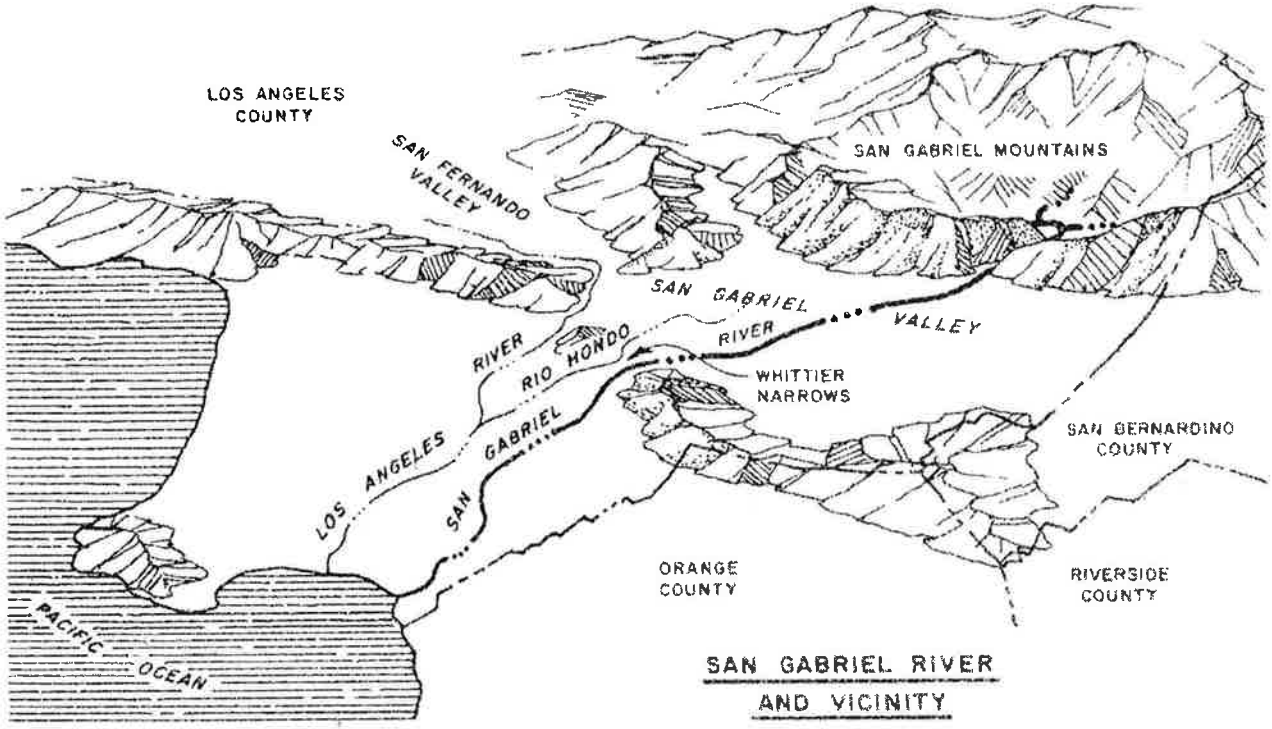
THIRTY-THIRD ANNUAL REPORT

OF THE

SAN GABRIEL RIVER WATERMASTER

FOR

1995-96



City of Long Beach, et al., vs. San Gabriel Valley Water Co., et al.
Case No. 722647 — Los Angeles County

February 28, 1997

SAN GABRIEL RIVER WATERMASTER

FOR
CITY OF LONG BEACH ET AL VS SAN GABRIEL VALLEY WATER CO. ET AL
CASE NO. 722647–LOS ANGELES COUNTY

WATERMASTERS
HOWARD H. HAILE
RICHARD A. RHONE
THOMAS M. STETSON

February 28, 1997

MAILING ADDRESS:
225 WEST BROADWAY
SUITE 400
GLENDALE, CA 91204-1331
TELEPHONE: (818) 244-0117
FAX: (818) 242-0480

To: Clerk of Superior Court of Los Angeles County and All Parties

Re: Watermaster Report for 1995-96 Water Year

Gentlemen:

We have the honor of submitting the Thirty-Third Annual Report of the San Gabriel River Watermaster for water year 1995-96, in accordance with the Judgment in Case No. 722647 entered September 24, 1965. A complete summary of Watermaster Findings is contained in this report.

The 1995-96 water year is the second year in the Third Long-term Accounting Period. The average precipitation at the four stations used to represent San Gabriel Valley rainfall for 1995-96 was 15.6 inches or 84 percent of the long-term average annual rainfall of 18.52 inches as defined in the Judgment. The ten-year average rainfall from 1986-87 through 1995-96 amounted to 17.9 inches, which, according to Table A of the Judgment, established the Lower Area Annual Entitlement at 94,000 acre-feet for 1995-99.

The principal findings of the Watermaster under annual accounting for the year 1995-96 are as follows:

		Acre-Feet
1.	Lower Area Annual Entitlement	94,000
2.	Usable water received by Lower Area	108,201
3.	Upper Area Credit for Water Year 1995-96	14,201
4.	Accrued Credit of Upper Area as of September 30, 1995	167,241

5.	Amount of Make-up Water received by Lower Area in 1995-96	0
6.	Accrued Credit of Upper Area as of September 30, 1996	181,442
7.	Amount of Make-up Water required to be delivered prior to October 1, 1997	0

A complete summary of Watermaster findings is contained in Chapter IV of this report.

The majority of the data required by the Watermaster is furnished by the Los Angeles County Department of Public Works. The cooperation and assistance furnished by the County and other agencies are gratefully acknowledged.

Sincerely,

SAN GABRIEL RIVER WATERMASTER

By: Thomas M. Stetson
Thomas M. Stetson

Howard H. Haile
Howard H. Haile

Richard A. Rhone
Richard A. Rhone

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CHAPTER I. ACTIVITIES OF WATERMASTER

This report is for the thirty-third year of operations under the Judgment in Case No. 722647 (the Long Beach case). Parties to the Judgment are listed on page A-1 of the Appendix. The Judgment declared that the Lower Area of the San Gabriel River System, the area downstream of Whittier Narrows, is entitled to receive an annual average of 98,415 acre-feet of Usable Water from the Upper Area, the area upstream of Whittier Narrows. The history of the litigation, the Judgment and related activities were described in the first twelve annual reports and in the thirty-first annual report on the occasion of the Second Long-term Accounting. Therefore, they will not be restated in this report.

The activities of the Watermaster include administration of operations under the Judgment, performance of field inspections, collection of data and maintenance of records, analyses of data, preparation of the annual report presenting the required determinations and findings, and maintenance of records of transfers of defendants' water rights. All operations and reports are based on the "Water Year," which is from October 1 through September 30.

Administration

The official office and depository of records of the Watermaster is 225 W. Broadway, Suite 400, Glendale, California. Such records are available for inspection during regular office hours at that office upon the request of any Party.

An audit of income and expenditures of the Watermaster for the water year 1995-96 was performed by the firm of Blazey & Company, CPA. Table 1 is the Statement of Income and Expenditures for the water year 1995-96 based on the Blazey Company's letter of November 27, 1996, which is in the Appendix of this Report.

TABLE 1

STATEMENT OF INCOME AND EXPENDITURES FOR THE WATER YEAR 1995-96

Carried forward from year 1994-95		$ 20,646.50
Income from 1995-96 assessments		72,000
Interest Income		1,226.41
		$ 93,872.91
Expenditures:		
1. Administrative fees and general operating expenses	$ 16,757.34	
2. Collection of data, field inspections and maintenance of records	15,635.44	
3. Calculations and preparation of Watermaster Report for water year 1994-95	35,492.51	
4. Printing and reproduction costs	1,464.99	
Total expenditures		69,350.28
Balance		$ 24,522.63

The tentative budget for the current water year (1996-97) was mailed to all Parties on July 3, 1996. Following a period of 15 days after service of the tentative budget, there being no objections received, the tentative budget became the final budget. The 1996-97 annual budget and proration of costs for payment thereof are shown in Table 2.

Watermaster Personnel

The Judgment provided for the appointment of a three-member Watermaster, one to represent the Upper Area, one to represent the Lower Area, and the third to represent both areas. On November 12, 1965, the three-member Watermaster was appointed and certified by the Court, namely Thomas M. Stetson representing the Upper Area, Max Bookman representing the Lower Area, and M. E. Salsbury representing both areas. Mr. Salsbury elected to conclude his years of service in 1985 and upon nomination from Upper San Gabriel Valley Municipal Water District (Upper District) and Central Basin Municipal Water District (Central Municipal), the Court appointed Howard H. Haile as his replacement effective February 7, 1985. Mr. Bookman elected to conclude his years of service in 1986 and upon nomination by the Lower Area Parties, the Court on January 14, 1986, appointed Richard A. Rhone to replace Mr. Bookman. This appointment was effective in February 1986.

The staff work for this report was by Richard Anderson for Bookman-Edmonston Engineering, Inc. and Stephen B. Johnson and Kevin Smead for Stetson Engineers Inc.

TABLE 2

WATERMASTER BUDGET FOR WATER YEAR 1996-97

1.	Administrative costs and general operating expenses	$15,000.00
2.	Hydrologic analyses, collection of data and field inspection	23,000.00
3.	Calculations and preparation of Watermaster Report for Water Year 1995-96	45,000.00
4.	Printing and reproduction costs	2,000.00
5.	Contingencies	6,000.00
	Total	$91,000.00
	Surplus carried forward from 1995-96	19,000.00
	To be financed for 1996-97	$72,000.00

Proration for Payment Purposes

Upper San Gabriel Valley Municipal Water District	50.0%	$36,000.00
Central Basin Municipal Water District	41.2%	29,664.00
City of Long Beach	7.125%	5,130.00
City of Compton	1.675%	1,206.00
Total		$72,000.00

Data Collection

The Watermaster collects data on streamflow, rainfall, water quality, ground water levels, export of ground water through Whittier Narrows, reclaimed water, imported replenishment water and other information as required. The principal source of data is the Los Angeles County Department of Public Works (hereinafter County). Copies of appropriate records were obtained from the County and many conferences were held between County personnel and Watermaster personnel in order that the Watermaster would be fully informed on the facts necessary to make the determinations required by the Judgment. Other data were obtained from the Metropolitan Water District of Southern California, the County Sanitation Districts of Los Angeles County, the Water Replenishment District of Southern California, the Upper San Gabriel Valley Municipal Water District, the San Gabriel Valley Municipal Water District, the Central Basin Municipal Water District, the San Gabriel Valley Water Company, Main San Gabriel Basin Watermaster, the U. S. Army Corps of Engineers, and the U. S. Geological Survey (USGS).

The collected data are summarized in a daily operation computer model. This model, developed by Watermaster personnel, aids in the efficiency and accuracy of the analyses.

Field Inspections

On March 17, 1996, the Watermaster and staff toured the Whittier Narrows area accompanied by County personnel. Particular points of interest were the key gaging stations in the area.

During the 1995-96 water year, Watermaster staff made several other field inspections of gaging stations and other facilities. Facilities inspected included some of the spreading grounds, stream gaging stations, imported water delivery points and river channels in the San Gabriel River system.

Preparation of Report

One of the required functions of the Watermaster is the preparation of the annual report presenting the findings required by the Judgment. The Judgment provides that a report be prepared and submitted within five months after the end of each water year, and copies of the report are to be filed with the Court and furnished to each of the Parties. Copies are also furnished to others upon request.

Stream Gaging Stations

The County and the U. S. Geological Survey operate the stream gaging stations on the San Gabriel River System, data from which are essential for determinations required of the Watermaster.

Plate 1, entitled "Stream Gaging Stations, Rio Hondo - San Gabriel River System," shows the general vicinity of the Whittier Narrows area. Plate 2, entitled "Map of Whittier Narrows," shows in greater detail certain features in Whittier Narrows including wells used for calculating subsurface flow.

The accuracy of measuring some of the higher surface water flows is at times questionable. Also, physical changes occur in the channel sections at several of the stream gaging stations. These problems and their resolutions are discussed in Chapter III.

Memorandum of Understanding (1982)

On May 13, 1982, a Memorandum of Understanding was executed by representatives of Upper and Lower Area Parties. That document recognizes the need for a continuing cooperative working relationship between the Upper and Lower Area Parties. The purpose of the agreement was to institute under present conditions certain practical accommodations which are not intended to constitute interpretations of or additions to the Judgment. That Memorandum of Understanding is still in effect and is included as an Appendix to the Thirty-first Annual Watermaster Report.

Transfer of Water Rights, Change of Address and Change of Name of Parties

During the 1995-96 water year there were no transfers of water rights reported to the Watermaster. There were four parties who reported changes of address to the Watermaster. The Watermaster notified all parties and the Court of these changes. The four parties' mailing address changes and their new addresses are:

City of Azusa, Azusa Valley Water Company
and
Azusa Agricultural Water Company
729 North Azusa Avenue
P.O. Box 9500
Azusa, CA 91702

Southern California Water Company
401 South San Dimas Canyon Road
San Dimas, CA 91773

CHAPTER II. LOWER AREA ENTITLEMENT

The Lower Area Annual Entitlement for the water year 1995-96 is based on the average annual rainfall which occurred in the 10-year period ending September 30, 1996, and the corresponding entitlement shown in Table A of the Judgment. Four precipitation stations are utilized to determine the annual precipitation for San Gabriel Valley. The four stations are located at San Dimas, Walnut, El Monte and Pasadena.

Rainfall during the 1995-96 water year at the four stations was as follows:

Station Number	Location	Depth of Rainfall in Inches
95	114 East First Street, San Dimas	17.46
102D	700 Fairway Drive, Walnut	13.29
108D	3615 North Santa Anita Avenue, El Monte	15.07
610B	City Hall, Pasadena	16.59
	Four Station Average Rainfall	15.60

Table 3 presents the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 1986-87 through 1995-96.

TABLE 3

AVERAGE ANNUAL RAINFALL IN SAN GABRIEL VALLEY 1986-87 THROUGH 1995-96

Water Year	Annual Precipitation Rainfall
1986-87	9.1
1987-88	14.9
1988-89	11.2
1989-90	12.4
1990-91	15.1
1991-92	22.8
1992-93	35.9
1993-94	11.6
1994-95	30.4
1995-96	15.6
Total	179.0
10-Year Average	17.9

Based on the 10-year average rainfall of 17.9 inches, the Lower Area Annual Entitlement for the 1995-96 water year is 94,000 acre-feet, determined from Table A of the Judgment.

CHAPTER III. USABLE WATER RECEIVED BY LOWER AREA

Presented in this Chapter is the determination of the quantity of Usable Water received by the Lower Area during the water year 1995-96. Also included is a discussion of the quality of water received by the Lower Area.

Surface Flow

The items to be included in Surface Flow through Whittier Narrows are set forth in Section III.A of Exhibit B of the Judgment. The measured flows and estimated flows are described below. The Judgment provides for adjustments to the measured flows where applicable. Some measurements during water year 1995-96 were found to be unreliable, questionable, or in error and appropriate adjustments were made by Watermaster. These adjustments are discussed later in this chapter.

Rio Hondo Above Mission Bridge, Station F64-R

In August of 1978, the flow recorder at this station was removed due to high maintenance costs and very poor control caused by a shifting sand bottom at the station. Also, the use of Whittier Narrows Reservoir for storage of storm waters for conservation purposes causes frequent backwater at the station during storm operations. The County removed the recorder at this station in 1995. The County Hydrographer schedules periodic current meter measurements at this station. Using these measurements and upstream measurements, a record of flow has been developed over the years which is considered to be more accurate than the recorder. This is due to the poor conditions of the channel section at the station and back water from Whittier Narrows Dam.

During water year 1995-96, a total of 25 current meter measurements were performed by the County. The Watermaster has determined that a synthesized flow at Station F64-R should be used for the entire year. Using data provided by the County and by the USGS, the Watermaster synthesized flow at the station as being equal to the sum of the flow at Garvey Avenue (E326-R), Alhambra Wash (F81D-R), imported water releases through CenB-36, plus an estimate of rising water. For some limited periods in 1995-96, the record at Garvey Avenue (E326-R) was inconsistent with measurements at other stations and County records. This occurred at times when large releases from storage were made past the County station at Lower Azusa Road on the Rio Hondo during non-storm periods. For periods when flow at Garvey was inconsistent and questionable, flow at Lower Azusa Road (F192B-R), about 2 miles upstream of E326-R, was used for the synthesized flow calculations. This was done for the entire month of October 1995, and for the period from August 23 through September 30. The synthesized flow at F64-R was utilized for the entire water year and it is considered that the record produced is reasonably accurate. This resulted in a total flow at Station F64-R for the 1995-96 water year of 63,300 acre-feet.

Additional analyses balancing all inflow stations with the outflow stations and the amount of water spread indicated some inconsistencies during days of very high flow. In those cases, appropriate adjustments were made, which are described later under the heading "Adjustments to Surface Flow."

Mission Creek at San Gabriel Boulevard, Station F83

The recorder was removed from this station during water year 1977-78 because of construction work by the Los Angeles County Road Department and the designation of the station was changed from "F83-R" to "F83", a non-recording station. The channel has also been realigned making reestablishment of the station less reliable. Historically, the majority of the water carried in Mission Creek was rising water.

In the past, weekly visits to this station were made by a County hydrographer and if there was surface water flow, a measurement was made. There was no record of Station F83 being measured or visited by a hydrographer during 1995-96. An observation was made by the Watermaster in March 1996 showing that Mission Creek was dry. As the spring is the time of maximum rising water and the Creek was dry in March, it is presumed to have been dry for the entire year.

Rio Hondo By-Pass Channel (Zone I Ditch), Station F313B-R

The measured flow at Station F313B-R for the 1995-96 water year was recorded by the County to be 21,870 acre-feet.

Whittier Narrows Flood Channel, Station G44B-R (formerly F337-R)

Station F337-R was located on the Rosemead Boulevard Bridge. Construction work in 1978-79 removed a levee which directed flow past this station and made the rating curve at this station questionable. Poor communication existed between the channel and the stilling well. In addition, the station was subject to backwater from the Rio Hondo side of Whittier Narrows Reservoir. However, water entering the Flood Channel crosses over a stabilizer weir. By using the Corps of Engineers' record of water surface elevations on the San Gabriel River side of Whittier Narrows Reservoir, the flow in the

Flood Channel was estimated by Watermaster staff. Historically, these estimates were prepared by applying an appropriate weir formula. During 1981-82 a flow measurement was made at the weir by County personnel. This measurement confirmed the calculations of flow by the weir formula. When appropriate flow balances were made, the Watermaster considered the use of the stabilizer weir a better means of determining flow than the old station.

The County in 1993 established a gaging station utilizing the stabilizing weir and a recorder and has designated the station G44B-R, Whittier Narrows Flood Channel. The Watermaster is utilizing records developed by the County and has spot-checked them utilizing a weir formula and records of reservoir stage obtained from the Corps of Engineers, operators of Whittier Narrows Reservoir. In general, these comparisons provided reasonably accurate data. For water year 1995-96, the mean daily discharge measurements at station G44B-R are consistent with the flow estimates using the weir flow calculations and, thus, confirms the method used. The flow through the Flood Channel for 1995-96 water year was determined to be 24,640 acre-feet.

Sycamore Canyon

The determination of runoff from Sycamore Canyon, which flows through Whittier Narrows, is based on a correlation with rainfall at Potrero Heights (Station 170F). Sycamore Canyon is located in the La Merced Hills northwesterly of Whittier Narrows and enters the Rio Hondo below Station F64-R, Rio Hondo above Mission Bridge. During the 1995-96 water year, rainfall at Station 170F was 14.83 inches. Referring to Table 6 of Exhibit B of the Judgment, the runoff from Sycamore Canyon was determined to be 105 acre-feet

San Gabriel River Below Parkway Bridge, Station F263C-R

The flow in the San Gabriel River below Parkway Bridge for the 1995-96 water year was recorded by the County to be 34,720 acre-feet. However, based on data from other stations and estimates of channel infiltration, adjustment to the above quantity was made for the period of April 9 to April 24, 1996. The value determined by the Watermaster as flow at Station F263C-R for the 1995-96 water year is 34,400 acre-feet.

San Gabriel River at Florence Avenue, Station F262C-R

This recording station replaced F262B-R beginning with water year 1988-89. The former station was discontinued during the summer of 1988 because the County constructed a rubber dam in the channel. The recording gage is now located about 5,100 feet further downstream at the beginning of the lined portion of the San Gabriel River. The County, with Watermaster concurrence, relocated this station to provide a more accurate measurement of flow to the ocean.

Flow in San Gabriel River at Florence Avenue for the 1995-96 water year was recorded by the County to be 2,727 acre-feet.

Rio Hondo Spreading Grounds Intake (Headworks)

The County constructed a low level intake to the Rio Hondo East Side Spreading Grounds in 1987. This intake supplements the original higher level intake and allows water to be diverted into the spreading grounds when the radial gates are raised. The spreading grounds inflow data were historically used to verify other records of inflow and to make adjustments.

Metering of the new low level intake was to be provided by means of an acoustical meter. When the low level installation was made a number of years ago, the

County specified an Accusonic meter located in the 102-inch diameter pipe downstream from the undershot slide gate assembly. Because of turbulence and air entrainment, the meter did not work properly and was moved to the intake channel located between the Rio Hondo channel and the diversion structures. Metering of the low level intake has not yet been done successfully. There were periods of time during which the records of Spreading Grounds inflow did not exist or were not accurate. The County assured the Watermaster that it would take whatever steps were necessary to provide accurate measurements at this station.

Several letters were sent to the County during 1994-95 which resulted in some facilitation of measures to improve quality of data at this station and other stations of concern to the Watermaster. For the low level intake, the project consisted of the replacement of the control console in the Headworks building with a new signal processor. The County installed a new control console, on loan from the manufacturer, in the middle of December 1995. The new console was tested for a period of several months through the storm period to determine if it will alleviate past operational problems with the system. This year's record appears to be more consistent than for previous years. Other intakes to the Spreading Grounds are equipped with parshall flumes and recorders.

Reclaimed Water Delivered to Rio Hondo Below Station F64-R

Water from the Whittier Narrows Water Reclamation Plant can be delivered to the San Gabriel River, Rio Hondo below Station F64-R, or to the Rio Hondo Bypass Channel (Zone I Ditch). The total water production from this plant was 10,335 acre-feet during the 1995-96 water year, of which 49 acre-feet was used by a commercial nursery near the plant site resulting in net release for groundwater recharge of 10,286 acre-feet. Of this

quantity, 9,870 acre-feet was delivered directly to Rio Hondo below the F64-R gage and must, therefore, be added as Surface Flow.

The balance of the Reclaimed Water from the Whittier Narrows Plant, in the amount of 416 acre-feet, was delivered to the San Gabriel River and accounted for in the recorded flows at the Parkway Bridge Station, F263C-R.

As mentioned above, reclaimed water from the Whittier Narrows Plant can also be delivered to the Zone I Ditch. In 1984, the location of the gaging station on the Zone I Ditch was moved from upstream of the point of delivery to downstream of the point of delivery. Thus, reclaimed water now delivered to the Zone I Ditch is included with the water measured at Station F313B-R. During the 1995-96 water year, no flow was delivered to the Zone I Ditch.

Reclaimed Water Delivered to San Gabriel River Below Station F263C-R

The San Jose Creek Water Reclamation Plant is located near the intersection of San Gabriel River and San Jose Diversion Channel, as shown on Plate 1. Reclaimed Water from this plant is carried in an outfall pipeline which generally parallels the San Gabriel River to a point south of Florence Avenue, where the flow can be released to the lined channel of the San Gabriel River. At the San Gabriel River Spreading Grounds Headworks, there is a turnout from this outfall pipeline so that Reclaimed Water can be delivered to the San Gabriel River Spreading Grounds or the unlined portion of the San Gabriel River for ground water recharge. This outlet is located immediately downstream of Station F263C-R.

During the 1995-96 water year, 12,095 acre-feet of reclaimed water from the San Jose Creek Water Reclamation Plant was delivered via this outfall pipeline to the San Gabriel River Spreading Grounds Headworks for replenishment purposes. This water was metered by a propeller meter in the turnout facility.

The flow in the San Jose Creek outfall pipeline not diverted for replenishment use is delivered to the lined portion of the San Gabriel River. During the 1995-96 water year, such flow amounted to approximately 42,920 acre-feet, and is not included as Surface Flow under the Judgment.

A second turnout for replenishment purposes from the San Jose Plant was first used in December 1986 to provide the option of releasing reclaimed water directly to the San Jose Diversion Channel. For the 1995-96 water year, 25,533 acre-feet of reclaimed water was released through the San Jose Creek Reclamation Plant Stages I and II for replenishment by the Lower Area. San Jose Plant reclaimed water released through this second turnout may be diverted to the Rio Hondo via the Zone I Ditch or to the San Gabriel River. A third turnout for replenishment purposes from the San Jose Plant was installed with expansion of Stage III of the San Jose Creek Plant. Effluent from Stage III can be delivered to the aforementioned outfall pipeline or delivered directly to the San Gabriel River at the Plant. Phase III construction was completed during the 1992-93 water year and this connection was first used on January 18, 1993. Water released to the San Gabriel River at this location totaled 3,867 acre-feet for the 1995-96 water year. This flow will commingle with that delivered from Stages I and II delivered to the San Jose Wash and can be diverted to the Rio Hondo via the Zone I Ditch or to the San Gabriel River where it would be measured at Parkway Bridge. For the 1995-96

water year, a total of 41,495 acre-feet of reclaimed water was released from the San Jose Creek Reclamation Plant for groundwater recharge. A part of this flow was subsequently lost to the ocean and was accounted for as described in a later section.

Adjustments to Surface Flow

The quantity of Surface Flow is, for the most part, based upon stream flow measurements made by the County. In essence, the method set forth in the Judgment is to measure the surface inflow to the Lower Area through Whittier Narrows and deduct that portion which leaves the Montebello Forebay at its lower end. The difference in these measurements represents a determination of the quantity of Surface Flow which infiltrates to the Montebello Forebay.

High runoff conditions occur during and following certain storms. The frequency of hydrographic measurements at stream gaging stations during 1995-96 was less than in past years. Certain inconsistencies can result from the inflow minus outflow calculations. While the stream gaging measurements may be within the accuracy of normal stream gaging measurements during periods of high flow, the amount of Usable Surface Flow is only a small portion of the total flow. Inaccuracies in the gaging of total flow will affect the determination of Usable Surface Flow. It also should be noted that storm runoff through Whittier Narrows has increased as a result of urbanization which tends to produce higher peak flows of a shorter duration, making the measuring program less reliable.

Accordingly, the Watermaster, after evaluating the available data, determined that for certain periods of time adjustments should be made in the quantities of Surface Flow as derived from the measurements. An alternative method of determining Surface Flow

for the Rio Hondo was outlined in the Fifth Annual Watermaster Report. In this method, an adjustment is made by first determining the amount delivered to Rio Hondo Spreading Grounds and adding thereto the estimated amount of water infiltrated in the Rio Hondo portion of the Whittier Narrows Reservoir. This is compared to the measured inflow minus the outflow and a determination is made as to the most reliable quantities.

Changes in the method of determining Surface Flow can be made under the terms of the Judgment. Reference is made to Exhibit B of the Judgment, Article III, Section A entitled, "Surface Water Measurements and Calculations," which reads in part:

> "In the event that any of the aforementioned gaging stations are inoperative for any reason and for any period of time the Watermaster shall estimate the quantity that would have been measured at the station had it been operative. The estimate shall be based on correlation to nearby operative measuring stations or on other reasonable engineering methods."

The Watermaster considers that stations are inoperative for the purposes of the Judgment when the measurements obtained are not of sufficient accuracy to produce reasonable results. For the 1995-96 water year, it was decided to apply the alternative method during certain periods of time to the Rio Hondo side of Whittier Narrows.

Presented in Table 4 is an adjustment to Rio Hondo inflow. This table presents a summary of the calculations utilizing the alternative method. Analysis of the daily inflow and outflow data indicated that the alternative method should be applied during 15 non-consecutive days of the 1995-96 water year. These days were January 19-22, 31; February 19-23; and March 4-5, 12-14. The unadjusted inflow to the Lower Area in the Rio Hondo as set forth in Table 4 was 51,773 acre-feet during those 15 days. The

outflow to the ocean during the same 15 days (calculated on a daily basis from stream gaging measurements as provided in the Judgment) was 23,194 acre-feet. (This latter value is unusable surface flow from the Upper Area.) In making the adjustment, the unusable outflow as measured at Stewart and Gray Road was accepted.

TABLE 4

LOWER AREA INFLOW AND OUTFLOW

ADJUSTMENT TO RIO HONDO INFLOW

Item	Amounts in Acre-Feet for 15 days [a] of the Water Year 1995-96	
A. UNADJUSTED INFLOW		
Rio Hondo Above Mission Bridge, F64-R	26,479	
Mission Creek at San Gabriel Boulevard, F83	0	
Rio Hondo By-Pass Channel (Zone 1 Ditch)	894	
Whittier Narrows Flood Channel	23,799	
Sycamore Canyon	68	
Ungaged Reclaimed Water	533	
Total Unadjusted Inflow		51,773
B. ADJUSTED INFLOW		
Infiltration		
Spreading grounds infiltration	11,186	
Reservoir area infiltration	853	
Total infiltration		12,039
Change in Reservoir Storage		+ 4,829
Outflow at Stewart and Gray Road		23,194
Total Adjusted Inflow		40,062
C. ADJUSTMENT		
Adjustment to Rio Hondo Inflow		11,711

(a) Days adjusted were January 19-22, 31; February 19-23; and March 4-5, 12-14.

The infiltration during the 15 days was calculated to be 12,039 acre-feet. This included the amount delivered to the spreading grounds and the water infiltrated in the Whittier Narrows Reservoir westerly of Rosemead Boulevard. In addition, the amount of water stored on the Rio Hondo side of the Reservoir increased by 4,829 acre-feet during those 15 days. The inflow is therefore adjusted by adding the quantity of infiltration (12,039 acre-feet) to the outflow (23,194 acre-feet) and adding the increase in storage (4,829 acre-feet) to determine the adjusted inflow in the amount of 40,062 acre-feet.

As shown on Table 4, the adjustment to the Rio Hondo inflow is minus 11,711 acre-feet. This adjustment relies on the spreading grounds inflow and estimated infiltration in Whittier Narrows Reservoir. These latter values provide a more accurate determination of Usable Water during high flows as opposed to taking the difference between inflows and outflows from stream gaging stations during periods of storm flows.

Summary of Surface Flow

A total of 154,569 acre-feet of surface water flowed through Whittier Narrows during the 1995-96 water year. Table 5 shows the components and the total Surface Flow.

TABLE 5

SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS FOR WATER YEAR 1995-96

	Amount in Acre-Feet
Rio Hondo above Mission Bridge, Station F64-R	63,300
Mission Creek at San Gabriel Boulevard, Station F83	0
Rio Hondo By-Pass Channel, Station F313B-R	21,870
Whittier Narrows Flood Channel	24,640
Sycamore Canyon	105
San Gabriel River below Parkway Bridge, Station F263C-R	34,400
Reclaimed Water From Whittier Narrows Plant Delivered to Rio Hondo below Station F64-R	9,870
Reclaimed Water from San Jose Plant Delivered to San Gabriel River below Station F263C-R	12,095
Adjustment to Rio Hondo Inflow (Table 4)	- 11,711
Total Surface Flow	154,569

Subsurface Flow

The method utilized to determine Subsurface Flow through Whittier Narrows is set forth in Exhibit B of the Judgment. The data used for computing Subsurface Flow are the spring and fall ground water elevations in Whittier Narrows. The measurement well locations are shown on Plate 2.

The Subsurface Flow for any year is the average of the six spring and fall computations of Subsurface Flow for the three years ending with the year of calculation. Shown in the following tabulation is the result of the calculation of Subsurface Flow for the 1995-96 water year which amounted to 27,400 acre-feet.

Time	Subsurface Flow in Acre-Feet
Spring 1994	27,800
Fall 1994	24,000
Spring 1995	23,000
Fall 1995	26,500
Spring 1996	29,200
Fall 1996	33,700
Subsurface Flow 1995-96	27,400

Export to Lower Area

The Watermaster is required to determine the amount of water which is pumped from ground water or diverted from surface streams in the Upper Area and transported in conduits through Whittier Narrows.

During the 1995-96 water year, there were four entities which transported water by pipeline through Whittier Narrows. All of the water exported through the Narrows

was ground water produced in the San Gabriel Valley. The annual export for each of the four exporters is shown below:

Exporter	Acre-feet
California Domestic Water Company	19,034
San Gabriel Valley Water Company	266
Suburban Water Systems	12,175
City of Whittier	8,090
Total	39,565

The Judgment provides that the maximum annual credit for export in the determination of Usable Water shall not exceed 23,395 acre-feet.

Lower Area Replenishment Water

The Lower Area purchases imported replenishment water from The Metropolitan Water District of Southern California. This imported water may be delivered at four Metropolitan connections: (1) Alhambra Wash (CenB-36); (2) San Gabriel River below Ramona Boulevard (CenB-37); (3) Foothill Feeder at San Dimas Wash (CenB-48); and (4) Upper Feeder at Thompson Creek (CenB-28). All connections are metered and delivered amounts are recorded by the Metropolitan Water District. These amounts are verified by personnel of the County.

During water year 1995-96 the total amount of imported water purchased from Metropolitan for replenishment was 18,012 acre-feet all of which was on behalf of the Lower Area.

MWD Connection	Imported Water (Acre-Feet)
Alhambra Wash (CenB-36)	12,370
San Gabriel River: Ramona Blvd. (CenB-37)	0
San Dimas Wash (CenB-48)	0
Thompson Creek (CenB-28)	5,642
Total	18,012

Provision is made in the Judgment for the deduction of evaporation losses upstream of Whittier Narrows occurring during conveyance of Lower Area Replenishment Water through San Gabriel Valley to Whittier Narrows. The total calculated amount of evaporation during the 1995-96 water year was 175 acre-feet.

Because of use of connection Cen B-36 during storm periods there were potential losses to the ocean of imported water during limited periods of time. Analysis of daily flows indicated that there was no imported water loss for water year 1995-96. After losses, the net amount of Lower Area Replenishment Water amounted to 17,837 acre-feet.

Reclaimed Water

Reclaimed Water used for replenishment of the Montebello Forebay came from three separate plants, each of which is operated by the County Sanitation Districts.

Whittier Narrows Water Reclamation Plant

The total amount of Reclaimed Water produced at the Whittier Narrows Water Reclamation Plant during the 1995-96 water year, and delivered to stream channels, was 10,286 acre-feet. During 1995-96, Whittier Narrows effluent was bypassed during storm operations. The amount of water bypassed that was included as Surface Outflow totaled 315 acre-feet for water year 1995-96. Therefore, a total of 9,971 acre-feet of Reclaimed

Water from the Whittier Narrows WRP was purchased by the Water Replenishment District of Southern California and spread in the Montebello Forebay.

Pomona Water Reclamation Plant

County Sanitation District No. 21 owns and operates a water reclamation plant near the City of Pomona. A portion of the reclaimed water is sold for industrial, agricultural, landscaping and other uses. During the 1995-96 water year a substantial quantity of reclaimed water from this plant reached Whittier Narrows. The plant facilities, discharge of effluent from the plant, and the method of determining the amount of discharge generated within the San Gabriel River system and reaching Whittier Narrows were described in the Fifth Annual Watermaster Report. Reclaimed Water is defined in the Judgment as water reclaimed from sewage generated in the watershed of the San Gabriel River System above Whittier Narrows. The area served by the Pomona Plant includes areas inside and outside of the San Gabriel River System. A study was conducted in 1995 to review the factors utilized in apportioning Pomona Plant effluent generated in the San Gabriel River System. As a result of the study, it was concluded that 76 percent of the effluent of the Pomona Plant originates from sewage generated within the San Gabriel River System. This reevaluation by the Watermaster staff is an increase from the 70 percent concluded by a similar study conducted in 1985. This apportionment will be reviewed periodically in the future.

The total production at the Pomona Water Reclamation Plant during the 1995-96 water year was 13,577 acre-feet. The majority of the effluent was delivered to the City of Pomona for resale. The undelivered portion, amounting to 2,974 acre-feet was delivered to San Jose Creek. It was determined that 287 acre-feet was wasted to the

ocean, 595 acre-feet percolated in the San Gabriel Valley, and 2,092 acre-feet percolated in the Montebello Forebay. The portion of this Reclaimed Water which was generated within the watershed of the San Gabriel River System was calculated to be 1,590 acre-feet.

San Jose Creek Water Reclamation Plant

The Water Replenishment District of Southern California purchases Reclaimed Water from the San Jose Creek Water Reclamation Plant. During the 1995-96 water year, 41,495acre-feet of Reclaimed Water from the San Jose Creek Water Reclamation Plant was delivered to the Lower Area for replenishment. Reclaimed water was bypassed for several days during the 1995-96 water year. The amount of water bypassed that was included as surface outflow during 1995-96 totaled 573 acre-feet. Therefore, a total of 40,922 acre-feet of such Reclaimed Water was spread in the Montebello Forebay. Total plant effluent for the 1995-96 water year was about 90,000 acre-feet.

Summary of Reclaimed Water

The total amount of reclaimed water which should be deducted from the inflow is 52,483 acre-feet for the 1995-96 water year. This is comprised of 9,971 acre-feet from the Whittier Narrows Water Reclamation Plant, 1,590 acre-feet from the Pomona Water Reclamation Plant which originated within the San Gabriel River watershed, and 40,922 acre-feet from the San Jose Creek Water Reclamation Plant.

Make-Up Water by Surface Flow Delivery

During 1995-96, the Upper Area did not supply any Make-Up Water by surface flow delivery or otherwise since there was no Make-up Water requirement to be delivered for that year.

Recirculation of Measured Water

There was no recirculation of measured water as defined in Paragraph 3(1) (6) of the Judgment during the 1995-96 water year.

Unusable Surface Flow

The water from the San Gabriel Valley which leaves Montebello Forebay as surface flow is called Unusable Surface Flow and is determined in accordance with Exhibit B of the Judgment. Surface outflow from the Montebello Forebay is accounted for in the Rio Hondo at Stewart and Gray Road, Station F45B-R, and in the San Gabriel River at Florence Avenue, Station F262C-R. This surface outflow may be comprised of water from the San Gabriel Valley and local storm water which enters the channels downstream of Whittier Narrows.

During the 1995-96 water year, measured surface outflow from the Montebello Forebay in the Rio Hondo at Station F45B-R was 29,240 acre-feet. This included water from the San Gabriel Valley, Local Storm Inflow originating downstream of Whittier Narrows and in some cases Lower Area replenishment water. The Local Storm Outflow on days when the radial gates at the Rio Hondo headworks were open was estimated by correlating the drainage areas of the unmeasured storm drains with the Montebello Storm Drain, which is equipped with a stream flow recorder. By analysis of flows on days

when the radial gates were open, it was possible to segregate the flow at Stewart and Gray Road into Local Storm Outflow, Unusable Surface Flow and replenishment water. The total loss to the ocean on such days was determined to be 27,785 acre-feet. It was determined that the Local Storm Outflow was 3,155 acre-feet and the Unusable Surface Flow in the Rio Hondo was 24,630 acre-feet. Unusable Surface Flow includes 825 acre-feet of reclaimed water which was previously deducted from Lower Area Replenishment Water. The total amount of Local Storm Inflow was calculated to be 5,254 acre-feet.

The total flow of the San Gabriel River at Florence Ave., Station F262C-R was measured to be 2,727 acre-feet. This flow consisted of Local Storm Inflow through storm drains located in the Montebello Forebay and surface inflow from the San Gabriel Valley. Most of the storm water in the San Gabriel River entering the Whittier Narrows Reservoir in excess of the spreading capacity in the San Gabriel River below Whittier Narrows Dam was conveyed by the Flood Channel to the Rio Hondo. The Local Storm Inflow was calculated to be 3,328 acre-feet based on correlation with the Montebello Storm Drain. The Local Storm Outflow on the San Gabriel River was determined to be514 acre-feet. Analyses of daily flows indicated a total Unusable Surface Flow from the Montebello Forebay in the San Gabriel River of 2,213 acre-feet during the 1995-96 water year. Unusable Surface Flow included 350 acre-feet of reclaimed water which was previously deducted from Lower Area Replenishment Water.

The total Unusable Surface Flow passing through the Montebello Forebay in the Rio Hondo and San Gabriel River in the 1995-96 water year was 26,843 acre-feet.

Determination of Usable Water

Usable Water under the terms of the Judgment is defined as the sum of Surface Flow, Subsurface Flow and Credited Export to Lower Area less the sum of Lower Area Replenishment Water, Reclaimed Water, Make-up Water by Surface Flow Delivery and Unusable Surface Flow. Table 6 presents the determination of Usable Water for the 1995-96 water year.

TABLE 6

USABLE WATER FOR WATER YEAR 1995-96

	Amount in Acre-Feet	
Surface Flow	154,569	
Subsurface Flow	27,400	
Credit for Export to Lower Area	23,395	
Subtotal		205,364
Less:		
Lower Area Replenishment Water	17,837	
Reclaimed Water	52,483	
Make-Up Water by Surface Flow Delivery	0	
Recirculation of Measured Water	0	
Unusable Surface Flow	26,843	
Subtotal		97,163
Usable Water		108,201

Quality of Water

The Judgment (Exhibit B, Section IV.E) provides that the Watermaster gather readily available data from public and private agencies relating to the quality of water. During the water year, quality data were obtained from the State Department of Water Resources, the County Sanitation Districts, Los Angeles County Department of Public Works, and the Metropolitan Water District of Southern California. Ground water quality data were also obtained from programs of the Main San Gabriel Basin Watermaster, Central Basin Municipal Water District, Water Replenishment District of Southern California and the U.S. Environmental Protection Agency (EPA). Reference was also made to the Annual Report on Results of Water Quality Monitoring prepared by the Water Replenishment District of Southern California. In the last few years increasing concern has developed over the trace constituents found in drinking water. Table 7 includes these constituents for illustrating both the quality of different sources of water supply and the increasing number of regulated constituents. Shown in Figures 1, 2 and 3 are graphical trends of salinity, hardness and nitrogen of the sources of imported and reclaimed water for recharge in the San Gabriel River System.

TABLE 7

WATER QUALITY ANALYSES REPRESENTATIVE OF SOURCES OF WATER PASSING THROUGH WHITTIER NARROWS WATER YEAR 1995-96(a)

		IMPORTED WATER		RECLAIMED WATER				RUNOFF WATER	
CATEGORY	DRINKING WATER STANDARDS	UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT (d)	SAN JOSE CREEK PLANT	SAN JOSE CREEK PLANT STAGE III	POMONA PLANT (d)	STORM FLOW (e)	SUBSURFACE FLOW (f)
DATE		4/1/96	4/1/96	4/17/96	4/7/96	4/17/96	4/18/96	2/19/96	7/17/96
pH	6.5-8.5	8.8	8.3	7.3	6.8	7.2	6.9	7.75	7.8
EC x 10^6 (mmho/cm)		373	1085					414	705
CATIONS									
Calcium		31	79	50	71	63	59	38	92
Magnesium		10	31	15	23	21	12	10	16
Sodium		36	99	101	137	128	96	28	45
Potassium		4	5	11	13	13	11	4	3.4
ANIONS									
Carbonate		4	0	0	0	0	0	0	0.8
Bicarbonate		82	165	282	267	264	253	82	201
Sulfate	250	37	281	85	132	84	61	69	91
Chloride	250	44	97	96	130	107	102	35	55
Nitrate as NO3	45	2.51	1.03						
Floride	1.8	0.11	0.31	0.68	0.52	0.80	0.36	0.16	0.27
Total Dissolved Solids (g)	500-1500	209	684	519	668	604	468	274	440
Total Hardness as CaCO3		94	325	188	273	243	196	135	295
Boron		0.19	0.12	0.53	0.43	0.55	0.51	ND	0.12
INORGANIC TRACE CONSTITUENTS									
Arsenic	0.05	ND	0.002	0.001	0.001	0.001	0.002	ND	0.002
Barium	1	0.037	0.169	0.04	0.04	0.04	0.03	ND	0.11
Cadmium	0.005	ND	0.002	ND	ND	ND	ND	ND	ND
Chromium, Total	0.05	ND	ND	ND	ND	ND	ND	ND	0.014
Lead	0.05	ND	ND	ND	ND	0.004	ND	ND	ND
Mercury	0.002	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	0.01	ND	ND	0.002	0.001	0.001	ND	ND	ND
Silver	0.05	ND	ND	ND	ND	ND	ND	ND	ND
NUTRIENTS as N									
Ammonia				14.5	8.2	12.1	10.2	ND	1.5
Nitrate				0.4	5.4	2.45	2.65	2.92	ND
Nitrite				0.49	1.07	1.46	0.96	0.07	ND
Organic Nitrogen				1.9	0.9	3.0	1.82		ND

(a) All constituents in mg/l unless noted. ND = None Detected.

(b) Sampled at Lake Silverwood. Purgeable organics in 1/96; trace inorganics in 5/96.

(c) Sampled at Lake Mathews. Purgeable organics in 1/96; trace inorganics in 5/96.

(d) Trace inorganic samples taken in May 1996.

(e) At San Gabriel Spreading Grounds.

(f) From Well 2947LM.

(g) By evaporation at 180° C.

TABLE 7 (CONT'D)

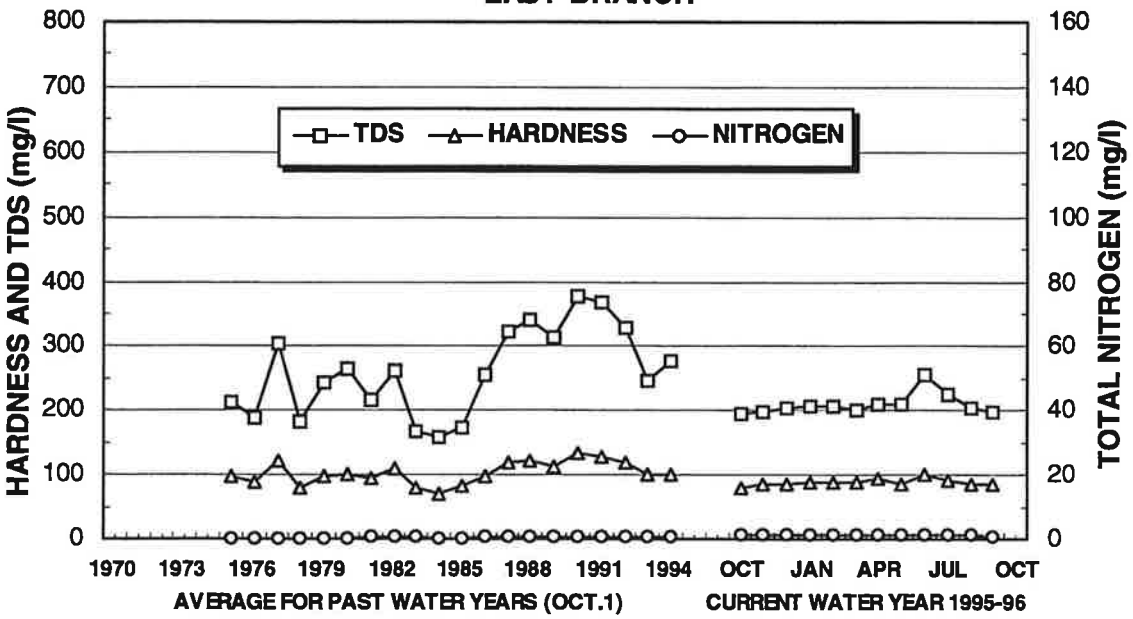
WATER QUALITY ANALYSES REPRESENTATIVE OF SOURCES OF WATER PASSING THROUGH WHITTIER NARROWS WATER YEAR 1995-96(a)

		IMPORTED WATER		RECLAIMED WATER				RUNOFF WATER	
CATEGORY	DRINKING WATER STANDARDS	UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT	SAN JOSE CREEK PLANT	SAN JOSE CREEK PLANT STAGE III	POMONA PLANT (d)	STORM FLOW (e)	SUBSURFACE FLOW (f)
DATE		4/15/96	4/15/96	4/9/96	4/3/96	4/2/96	4/9/96	2/19/96	7/17/96
PURGEABLE ORGANICS, ug/l									
Methylene Chloride	5	ND	ND	1.0	6.1	2.3	ND	ND	ND
Chloroform	100 (h)			11	4.5	8.7	8.4	ND	ND
Bromodichloromethane	100 (h)			0.5	0.8	1.0	1.1	ND	ND
Dibromochloromethane	100 (h)			ND	0.5	ND	ND	ND	ND
Bromoform	100 (h)			ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	200	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	6	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	5	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	5	ND	ND	0.3	0.3	0.3	ND	ND	0.6
Benzene	1	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	100	ND	ND	0.3	ND	ND	ND	ND	ND
Chlorobenzene	30	ND	ND	ND	ND	ND	ND	ND	ND
O-Dichlorobenzene	130 (i)	ND	ND	ND	ND	ND	ND	ND	ND
M-Dichlorobenzene	130 (i)	ND	ND	ND	ND	ND	ND	ND	ND
P-Dichlorobenzene	5	ND	ND	0.8	ND	0.5	ND	ND	ND
Cis-1,2-Dichloroethylene	6	ND	ND						1.4
Trans-1,2-Dichloroethylene	10	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane		ND	ND	ND	ND	ND	ND		ND
Chloroethane		ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether				ND	ND	ND	ND	ND	ND
Chloromethane		ND	ND	ND	ND	ND	ND		ND
1,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	0.5(j)	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	0.5(j)	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Techrachloroethane	1	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	ND	ND	ND
NON-PURGEABLE ORGANICS, ug/l									
Bis(2-ehtylhexyl)phthalate	4	ND	ND	ND	ND	3.0	ND	ND	ND
1,2,4-Trichlorobenzene		ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol				ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol				ND	ND	ND	ND	ND	ND
2,3,4-Trichlorophenol				ND	ND	ND	ND		ND
2,3,6-Trichlorophenol				ND	ND	ND	ND		ND
3,4,5-Trichlorophenol				ND	ND	ND	ND		ND
Pentachlorophenol	30	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene		ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene				ND	ND	ND	ND	ND	ND
Atrazine	3	ND	ND	ND	ND	ND	ND	ND	ND
Simazine	10	ND	ND	ND	ND	ND	ND	ND	0.1
Phenylacetic Acid				ND	ND	ND	ND		ND
Phenol	1			ND	ND	ND	ND	ND	ND
CHLORINATED HYDROCARBONS, ug/l									
DDT		ND	ND	ND	ND	ND	ND	ND	ND
BHC	0.3-0.7	ND	ND	ND	ND	ND	ND	ND	ND
Lindane	4	ND	ND	0.03	0.03	0.03	0.03	ND	ND
Heptachlor	0.01	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	0.01	ND	ND	ND	ND	ND	ND	ND	ND
Aldrin	0.05	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	0.05	ND	ND	ND	ND	ND	ND	ND	ND

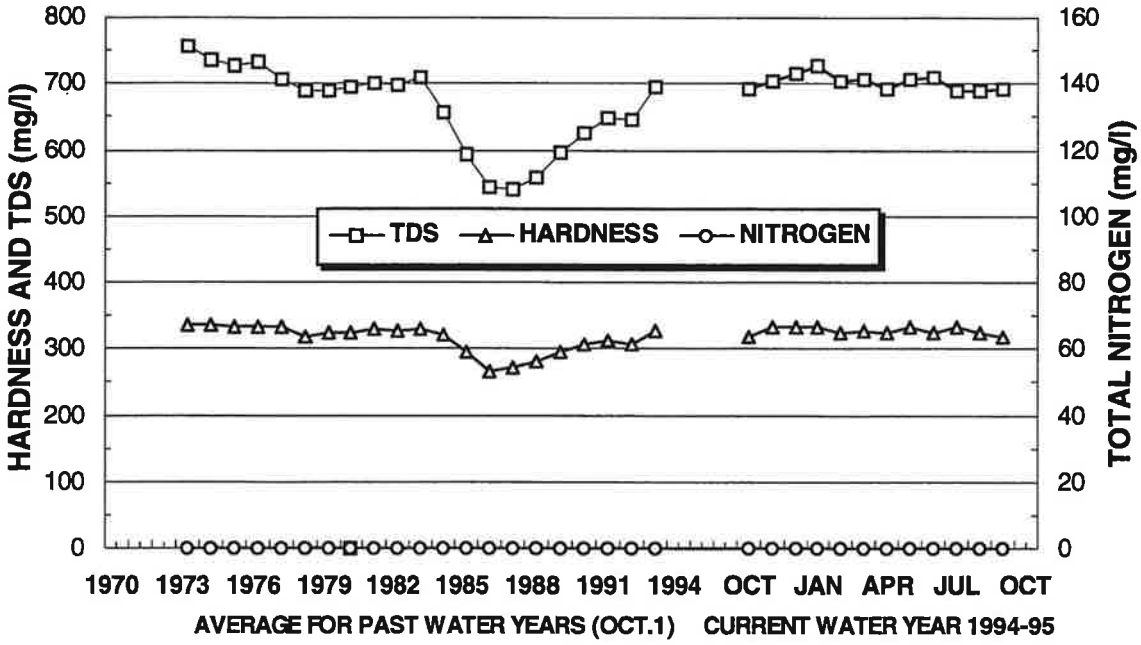
(a) All constituents in mg/l unless noted. ND = None Detected.
(b) Sampled at Lake Silverwood. Purgeable organics in 1/96; trace inorganics in 5/96.
(c) Sampled at Lake Mathews. Purgeable organics in 1/96; trace inorganics in 5/96.
(d) Trace inorganic samples taken in May 1996.
(e) At San Gabriel Spreading Grounds.
(f) From Well 2947LM.
(h) Total Trihalomethanes is not to exceed 100 ug/l.
(i) Sum not to exceed 130.0 ug/l.
(j) Sum not to exceed 0.5ug/l.

UNTREATED STATE PROJECT WATER

EAST BRANCH

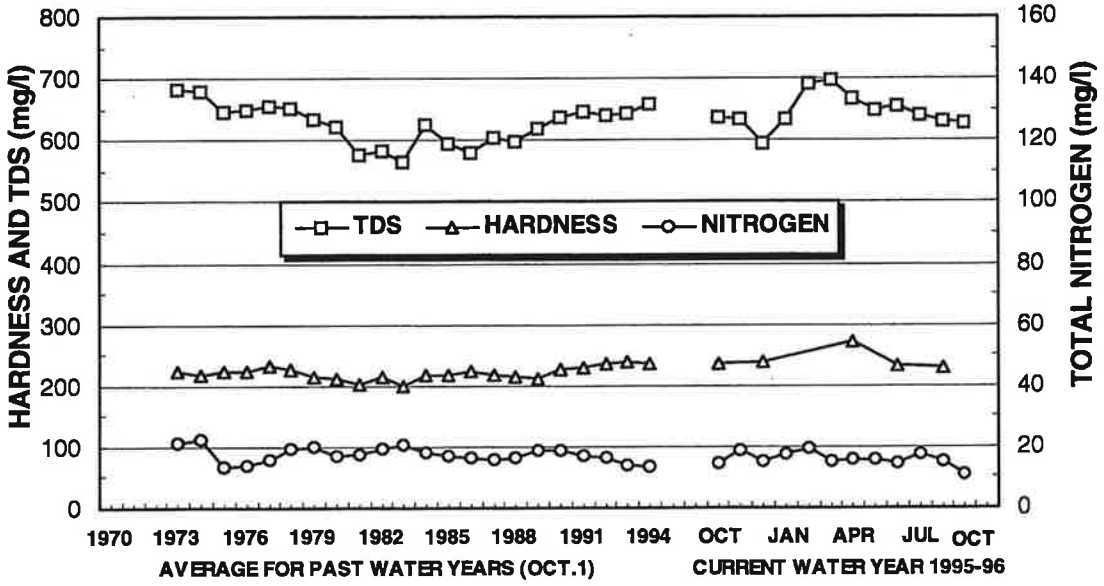


UNTREATED COLORADO RIVER WATER

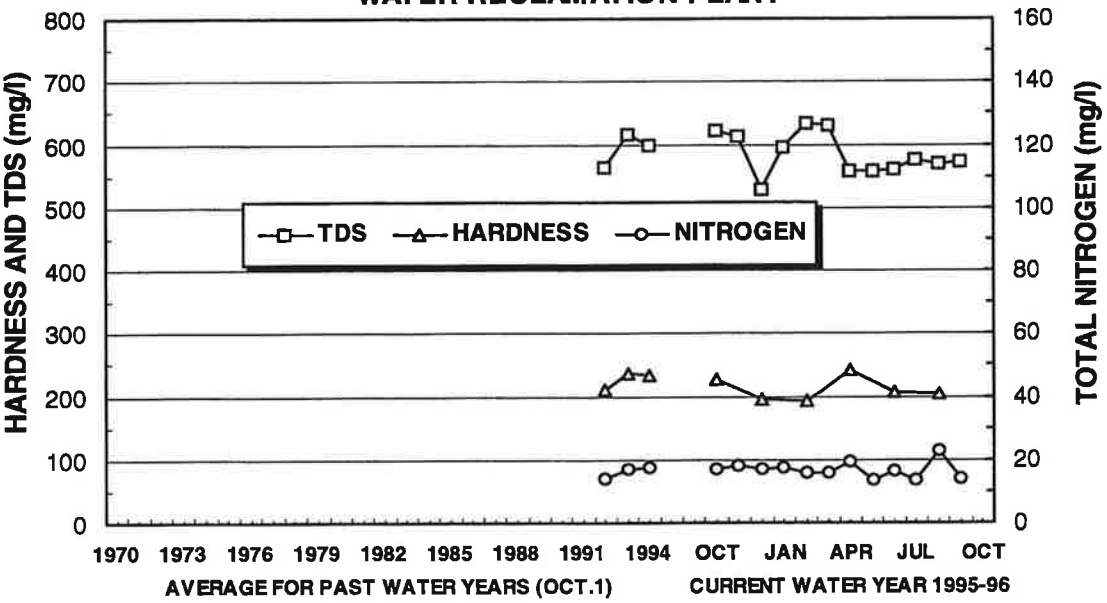


SELECTED WATER QUALITY PARAMETERS OF IMPORTED WATER

SAN JOSE CREEK
WATER RECLAMATION PLANT

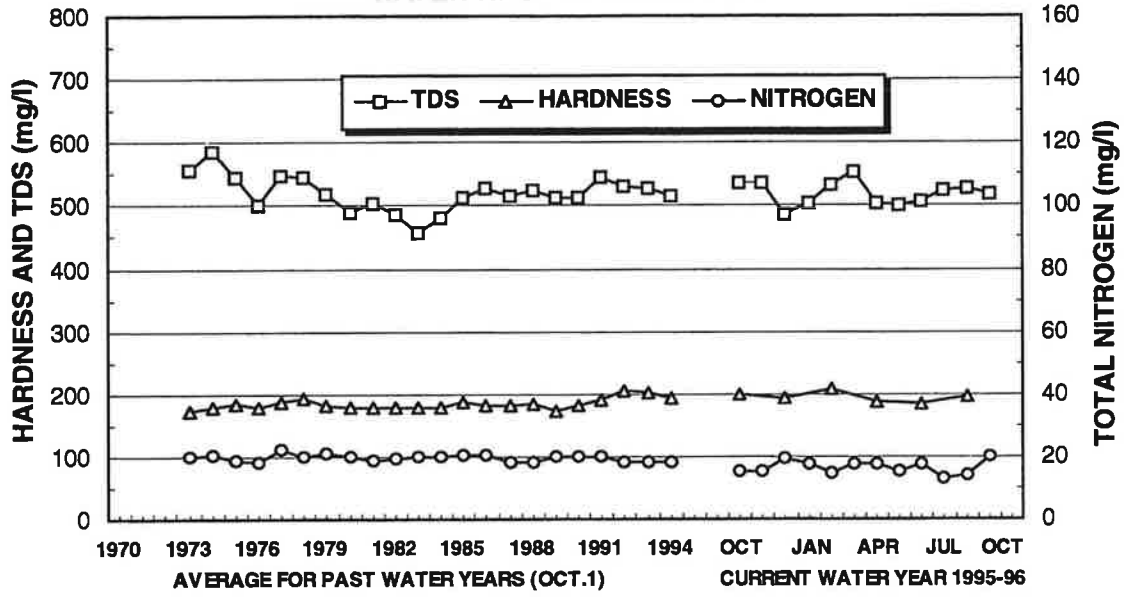


SAN JOSE CREEK III
WATER RECLAMATION PLANT

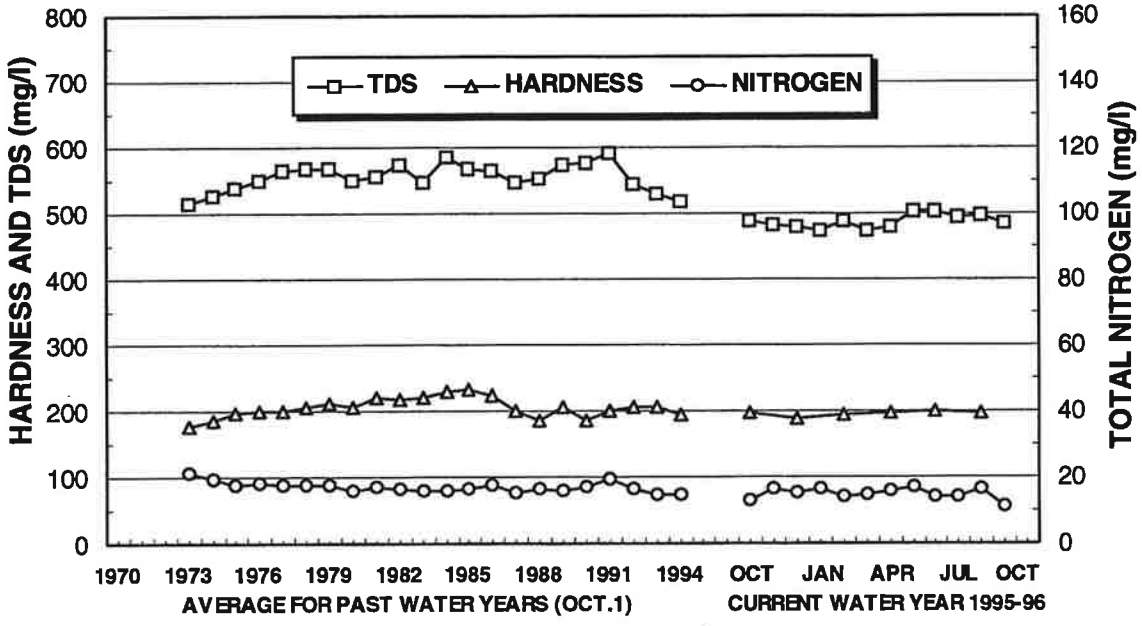


SELECTED WATER QUALITY PARAMETERS OF RECLAIMED WATER

WHITTIER NARROWS
WATER RECLAMATION PLANT



POMONA
WATER RECLAMATION PLANT



SELECTED WATER QUALITY PARAMETERS OF RECLAIMED WATER

CHAPTER IV. ANNUAL ACCOUNTING AND MAKE-UP WATER REQUIREMENTS

Under the terms of the Judgment, the Watermaster is required to annually determine the Accrued Debit or Credit of the Upper Area and the obligations, if any, of the Upper Area to deliver Make-up Water during the ensuing water year.

Delivery of Make-up Water During 1995-96

Because of the existence of an Accrued Credit at the end of 1994-95, the Upper Area made no Make-up Water delivery to the Lower Area during the 1995-96 water year.

Accrued Credit as of September 30, 1996

The Lower Area Annual Entitlement as heretofore determined for the 1995-96 water year was 94,000 acre-feet. The Usable Water received was 108,201 acre-feet, which resulted in a credit to the Upper Area for the water year of 14,201 acre-feet. The Upper Area had an Accrued Credit as of September 30, 1995, of 167,241 acre-feet. Thus the total Accrued Credit of the Upper Area as of September 30, 1996 is 181,442 acre-feet.

Requirement for Make-up Water Delivery in 1996-97

Because of the existence of an Accrued Credit on September 30, 1996, the Upper Area is under no obligation to deliver Make-up Water to the Lower Area during 1996-97.

Summary

Table 8 presents a summary of the findings of the Watermaster for the 1995-96 water year.

TABLE 8

SUMMARY OF FINDINGS FOR WATER YEAR 1995-96

		Quantities In Acre-Feet
1.	Rainfall 1995-96, 15.6 inches	
2.	Ten-year average rainfall, 17.9 inches	
3.	Lower Area Annual Entitlement	94,000
4.	Surface flow through Whittier Narrows	154,569
5.	Subsurface Flow through Whittier Narrows	27,400
6.	Water exported through Whittier Narrows	23,395
7.	Total Flow through Whittier Narrows	205,364
8.	Lower Area Replenishment Water	17,837
9.	Reclaimed Water	52,483
10.	Make-up Water (Surface Flow Delivery)	0
11.	Recirculation of Measured Water	0
12.	Unusable Surface Flow	26,843
13.	Usable Water Received by Lower Area	108,201
14.	Credit for Water Year 1995-96	14,201
15.	Accrued Credit of Upper Area as of September 30, 1995	167,241
16.	Amount of Make-up Water delivered during Water Year 1995-96	
	a. Payment for Reclaimed Water	0
	b. Surface Flow Delivery	0
	Total	0
17.	Adjusted Accrued Credit of Upper Area as of September 30, 1995	167,241
18.	Accrued Credit of Upper Area as of September 30, 1996	181,442
19.	Required Make-up Water to be delivered during Water Year 1996-97	0

CHAPTER V. LONG-TERM ACCOUNTING

Long-term Accounting is required by paragraph 5(h) of the Judgment. The first Long-term Accounting period under the Judgment included the 16 water years from 1963-64 through 1978-79. The second Long-term Accounting period included the 15 water years 1979-80 through 1993-94. The Third Long-term Accounting Period starts with the 1994-95 water year. The Long-term Accounting periods are discussed in this Chapter.

The Watermaster is required from time to time, but not sooner than 15 years nor more than 25 years after September 30, 1963 and after the close of each Long-term Accounting period, to make a Long-term Accounting of the aggregate amount of Usable Water and Make-up Water received by the Lower Area. A Long-term Accounting is to be made sooner than 25 years if the average annual rainfall for a period of 15 or more years is at least 18 inches but not more than 19 inches.

The quantity of Usable Water and Make-up Water received during a Long-term Accounting period is compared to a quantity based upon the annual entitlement (98,415 acre-feet) multiplied by the number of years in the period and then adjusted by the ratio of the average annual rainfall for that period to the long-term average annual rainfall (18.52 inches). The difference in the amount of water received and the total annual entitlements is carried forward as either a credit or debit of the Upper Area.

First Long-term Accounting Period

As reported in the Sixteenth Annual Report, the First Long-term Accounting under the Judgment occurred as of September 30, 1979 for the period of 16 water years 1963-64

through 1978-79. The rainfall for the period averaged 18.16 inches resulting in a total entitlement of 1,544,031 acre-feet for the 16-year period. The amount of Usable Water and Make-up Water received was 1,376,090 acre-feet resulting in a Long-term Accounting Debit of 167,941 acre-feet.

Make-up Water Deliveries

The Judgment provides that the debit under Long-term Accounting be made up over a three-year period. Representatives of the Upper Area and Lower Area agreed that Make-up Water for the first Long-term Accounting Period could be delivered over a five-year period, requiring not less than one-fifth be delivered each year. Use of credit for Reclaimed Water, however, was limited to the first three years of the repayment period.

During the five years 1979-80 through 1983-84, the Upper Area delivered 167,941 acre-feet of Make-up Water to the Lower Area to satisfy the First Long-term Accounting. Thus, the Make-up Water delivery for the First Long-term Accounting Period was fully satisfied. A detailed description of the deliveries is contained in the Twenty-Second Annual Report.

Second Long-term Accounting Period

Table 9 is a summary of operations under the Judgment showing Lower Area Annual Entitlement, Usable Water and Make-up Water received by the Lower Area and the Accrued Debit or Credit of Upper Area for each year of operation during the Second Long-term Accounting period from 1979-80 through 1993-94.

As previously mentioned, Long-term Accounting is to be made sooner than the 25th year if the average annual rainfall for a period of 15 or more years is at least 18

inches but not more than 19 inches. Shown in Table 10 are the data used for the Second Long-term Accounting period. As shown on Table 10, the annual rainfall for the first fifteen years of operation under the Second Long-term Accounting period averaged 18.89 inches. Because at least 15 years elapsed since the First Long-term Accounting Period and because the average annual rainfall was between 18 and 19 inches, the Second Long-term Accounting was made. The rainfall for the period averaged 18.89 inches resulting in a long-term entitlement of 1,505,718 acre-feet. The amount of Usable Water received by the Lower Area was 1,631,156 acre-feet resulting in a credit of 125,438 acre-feet to be carried into the Third Long-term Accounting Period.

TABLE 9

SUMMARY OF ANNUAL OPERATIONS UNDER JUDGMENT DURING SECOND LONG-TERM ACCOUNTING PERIOD

(In Acre-Feet)

Water Year	Entitlement	Water Received by Lower Area			Accrued Credit (+) or Debit (-)
		Usable	Make-Up[a]	Total	
1979-80	107,600	137,175	0	137,175	+29,575
1980-81	105,700	85,917	0	85,917	+ 9,792
1981-82	111,900	94,823	0	94,823	- 7,285
1982-83	122,200	185,014	7,285	192,299	+62,814
1983-84	118,600	99,725	0	99,725	+43,939
1984-85	118,100	90,965	0	90,965	+16,804
1985-86	123,900	119,457	0	119,457	+12,361
1986-87	121,000	63,192	0	63,192	- 45,447
1987-88	106,300	85,251	20,447	105,698	- 46,049
1988-89	98,800	70,280	21,190	91,470	- 53,379
1989-90	81,800	67,709	28,279	95,988	- 39,191
1990-91	85,600	75,572	14,835	90,407	- 34,384
1991-92	88,700	105,990	14,735	120,725	- 2,359
1992-93	86,400	156,594	2,359	158,953	+70,194
1993-94	---	84,362	0	84,362	---
Totals	1,505,718[b]	1,522,026	109,130	1,631,156	125,438

(a) Does not include deliveries of Make-up Water for First Long-term Accounting

(b) The figures shown for the first 14 years are for information purposes only. The Second Long-term Accounting was determined in accordance with paragraph 5(h) of the Judgment.

TABLE 10

DATA FOR SECOND LONG-TERM ACCOUNTING PERIOD

Number of Years	Water Year	Rainfall in Inches		Water Received by Lower Area in Acre-Feet				Long-Term Accounting Formula[b] in Acre-Feet
		Amount	Accumulated Average Annual Amount	Usable	Make-Up[a]	Total	Accumulated Total	
1	1979-80	34.85	34.85	137,175	0	137,175	137,175	185,192
2	1980-81	10.31	22.58	85,917	0	85,917	223,092	239,980
3	1981-82	18.88	21.35	94,823	0	94,823	317,915	340,361
4	1982-83	39.26	25.82	185,014	7,285	192,299	510,214	548,828
5	1983-84	10.56	22.77	99,725	0	99,725	609,939	604,997
6	1984-85	14.58	21.41	90,965	0	90,965	700,904	682,635
7	1985-86	21.96	21.48	119,457	0	119,457	820,361	799,011
8	1986-87	9.06	19.93	63,192	0	63,192	883,553	847,262
9	1987-88	14.88	19.37	85,251	20,447	105,698	989,251	926,387
10	1988-89	11.15	18.55	70,280	21,190	91,470	1,080,721	985,744
11	1989-90	12.35	17.99	67,709	28,279	95,988	1,176,709	1,051,585
12	1990-91	15.12	17.75	75,572	14,835	90,407	1,267,116	1,131,879
13	1991-92	22.80	18.14	105,990	14,735	120,725	1,387,841	1,253,144
14	1992-93	35.94	19.41	156,594	2,359	158,953	1,546,794	1,444,022
15	1993-94	11.64	18.89	84,362	0	84,362	1,631,156	1,505,718

(a) Excludes water delivered to Make-up for deficit in First Long-term Accounting Period.

(b) The figures shown for first 14 years are for informational purposes only. The Second Long-term Accounting was determined in accordance with paragraph 5(h) of the Judgment.

Third Long-term Accounting Period

Table 11 is a summary of operations under the Judgment showing Lower Area Annual Entitlement, Usable Water and Make-up Water received by the Lower Area and the Accrued Debit or Credit of Upper Area for each year of operation during the Third Long-term Accounting Period beginning with 1994-95. Included in the Accrued Credit of the Upper Area at the start of the period is the carryover from the Second Long-term Accounting Period of 125,438 acre-feet.

Water Year 1995-96 is the second year in the third Long-term Accounting Period which as explained above can occur between the 15th and 25th year. Table 12 is a summary of operations under the Judgment showing data to be used for the Third Long-term Accounting.

TABLE 11

SUMMARY OF ANNUAL OPERATIONS UNDER JUDGMENT DURING THIRD LONG-TERM ACCOUNTING PERIOD

(In Acre-Feet)

Water Year	Entitlement	Water Received by Lower Area			Annual Credit (+) or Debit (-)	Accrued Credit (+) or Debit (-)
		Usable	Make-Up[a]	Total		
1993-94	---					125,438[a]
1994-95	98,300	140,103	0	140,103	+41,803	167,241
1995-96	94,000	108,201	0	108,201	+14,201	181,442
Totals	192,300	248,304	0	248,304		---

[a] Carryover of credit from Second Long-term Accounting Period.

TABLE 12

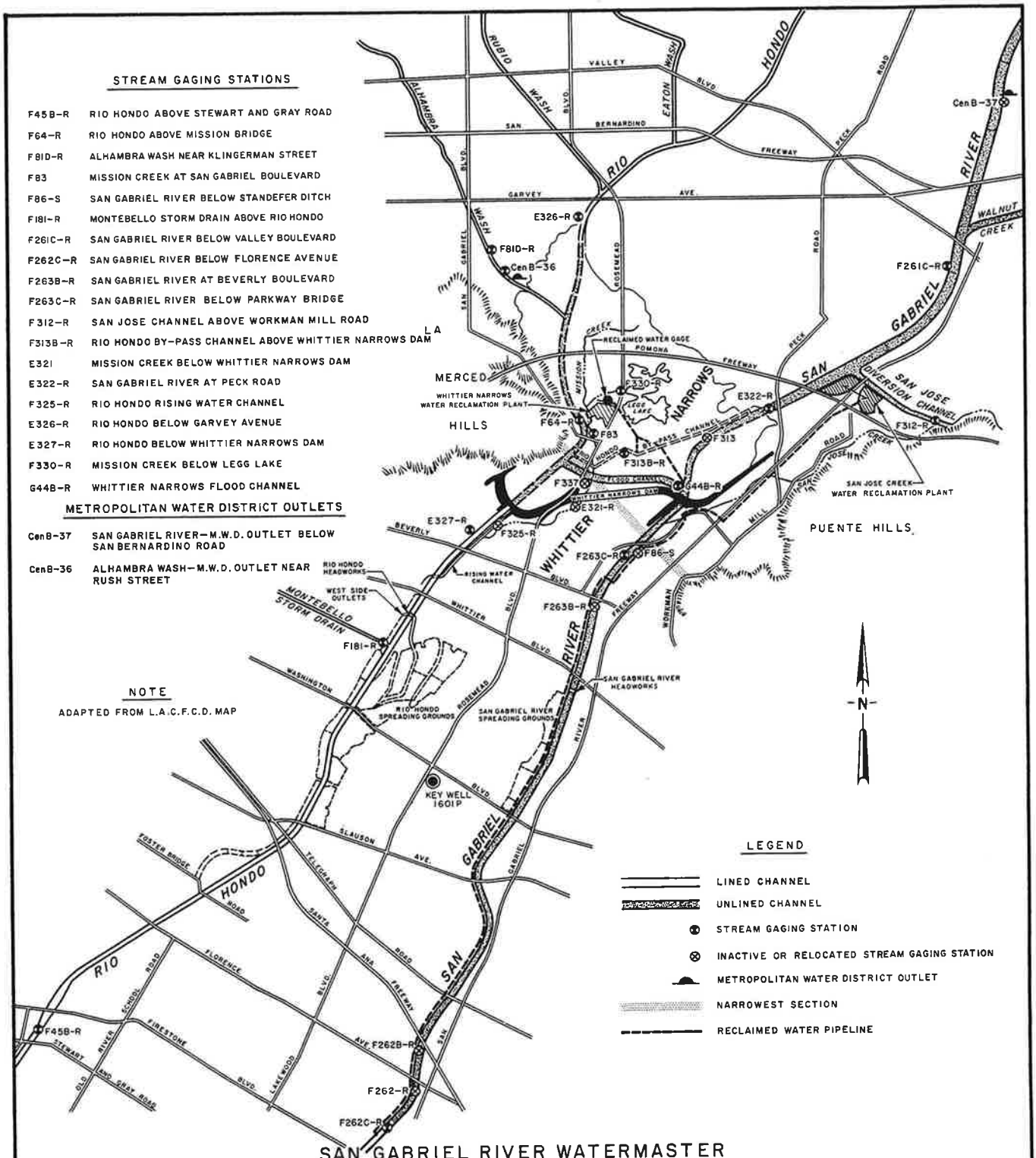
DATA FOR THIRD LONG-TERM ACCOUNTING PERIOD

Number of Years	Water Year	Rainfall in Inches		Water Received by Lower Area in Acre-Feet				Long-Term Accounting Formula[b] in Acre-Feet
		Amount	Accumulated Average Annual Amount	Usable	Make-Up	Total	Accumulated Total	
0[a]	1993-94	---	---	---	---		125,438[a]	---
1	1994-95	30.44	30.44	140,103	0	140,103	265,541	161,758
2	1995-96	15.60	23.02	108,201	0	108,201	373,742	244,656

(a) Credit carried forward from Second Long-term Accounting.

(b) The figures shown are for informational purposes only. The Third Long-term Accounting will be determined in accordance with paragraph 5(h) of the Judgment.

PLATE I



SAN GABRIEL RIVER WATERMASTER

CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647

STREAM GAGING STATIONS
RIO HONDO — SAN GABRIEL RIVER SYSTEM

WATERMASTERS
HOWARD H. HAILE—RICHARD A. RHONE—THOMAS M. STETSON

SCALE OF FEET
4000 0 4000 8000

REVISED 2/94

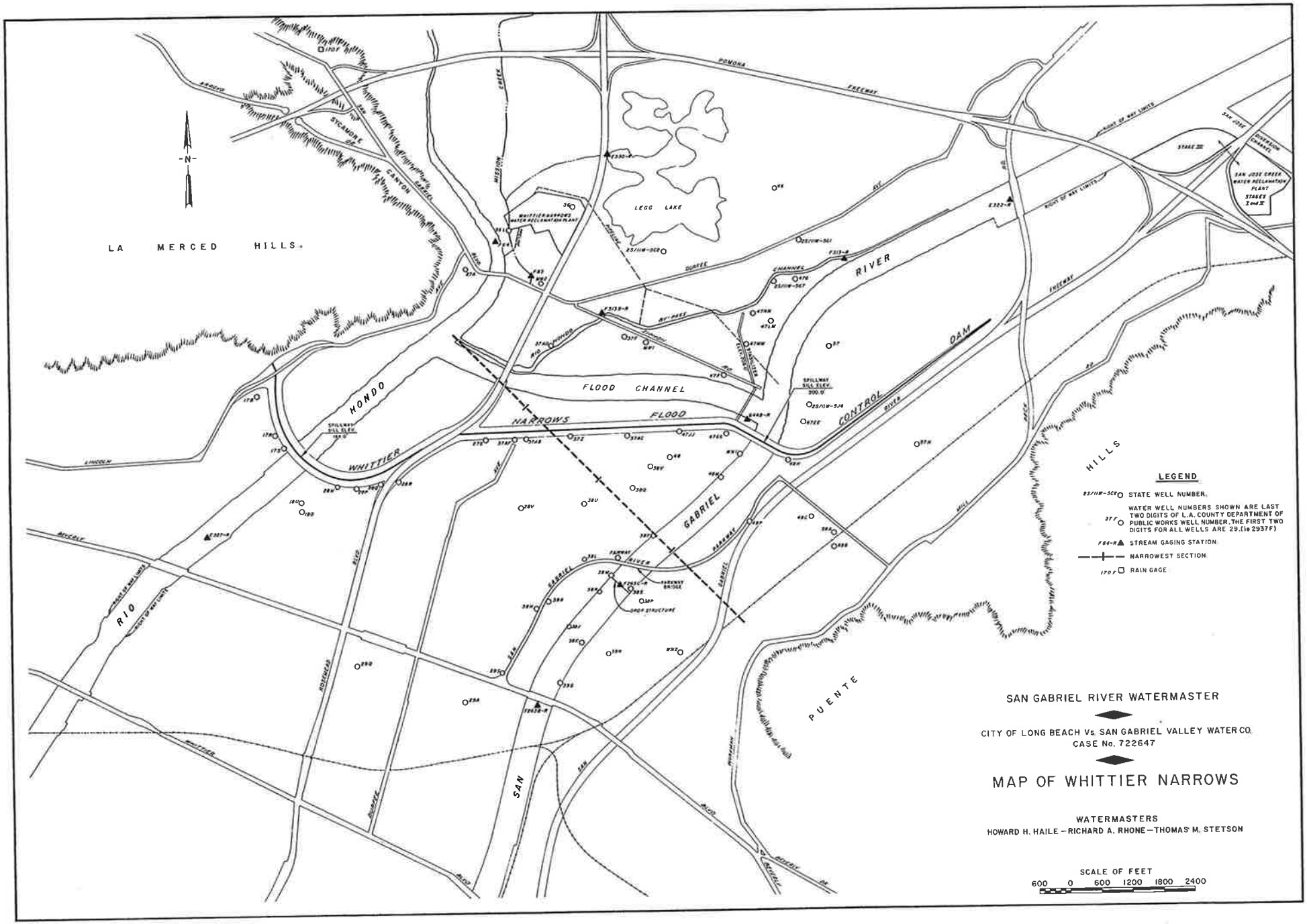

LA MERCED HILLS
HONDO CANYON
SYCAMORE CANYON
WHITTIER NARROWS FLOOD CONTROL DAM
FLOOD CHANNEL
LEGG LAKE
WHITTIER NARROWS WATER RECLAMATION PLANT
SAN JOSE CREEK WATER RECLAMATION PLANT STAGES I and II
SAN JOSE CREEK
POMONA FREEWAY
RIVER
HILLS
PUENTE
RIO HONDO
SAN GABRIEL RIVER
LEGEND
STATE WELL NUMBER
WATER WELL NUMBERS SHOWN ARE LAST TWO DIGITS OF L.A. COUNTY DEPARTMENT OF PUBLIC WORKS WELL NUMBER. THE FIRST TWO DIGITS FOR ALL WELLS ARE 29.(ie 2937F)
STREAM GAGING STATION
NARROWEST SECTION
RAIN GAGE
SAN GABRIEL RIVER WATERMASTER
CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647
MAP OF WHITTIER NARROWS
WATERMASTERS
HOWARD H. HAILE – RICHARD A. RHONE – THOMAS M. STETSON
SCALE OF FEET
600 0 600 1200 1800 2400

PLATE 2

APPENDIX

PARTIES TO JUDGMENT
CITY OF LONG BEACH, ET AL, VS.
SAN GABRIEL VALLEY WATER CO., ET AL,
CASE NO. 722647 - LOS ANGELES COUNTY

Court - Clerk of Superior Court (Case No. 722647)

Plaintiffs

Board of Water Commissioners of the City of Long Beach
Central Basin Municipal Water District
City of Compton

Defendants

San Gabriel Valley Water Company
(includes, by merger, Vallecito Water Company)
Azusa Agricultural Water Company
Azusa Valley Water Company
California-American Water Company
(successor to California Water and Telephone Company)
Covina Irrigating Company
East Pasadena Water Company, Ltd.
Glendora Irrigating Company (now City of Glendora)
Southern California Water Company
Suburban Water Systems
Sunny Slope Water Company
City of Alhambra
City of Arcadia
City of Azusa
City of Covina
City of El Monte
City of Glendora
City of Industry (successor to Cross Water Company)
City of Monrovia
City of Monterey Park
City of South Pasadena
San Gabriel County Water District
Valley County Water District
(formerly known as Baldwin Park County Water District)

Intervenors

Upper San Gabriel Valley Municipal Water District
California Domestic Water Company

BLAZEY & COMPANY
Certified Public Accountant

November 27, 1996

San Gabriel River Watermaster
225 W. Broadway, Suite 400
Glendale, California 91203

In our opinion, the accompanying statement of Income and Expenditures for the San Gabriel River Watermaster for the water year 1995-1996 presents fairly the results of its operations for the year in conformity with generally accepted accounting principles. Our examination was made in accordance with generally accepted auditing standards, and accordingly included tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Blazey & Company

Blazey & Company
Certified Public Accountant

206 North Jackson, Suite 200 - Glendale, CA 91206
~(818) 246-2331 -- (818) 246-0313~

SAN GABRIEL RIVER WATERMASTER
Statement of Income and Expenditures
For the Water Year 1995-1996

Carried forward from year 1994-1995		$ 20,646.50
Income		72,000.00
Interest Income		1,226.41
		$ 93,872.91
Expenditures:		
Administrative fees and general operating expenses	$16,757.34	
Collection of data, field inspections and maintenance of records	15,635.44	
Calculations and preparation of Watermaster Reports for water years 1993-1994	35,492.51	
Printing and reproduction costs	1,464.99	
Total Expenditures		$ 69,350.28
Balance		$ 24,522.63