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60th ANNUAL REPORT

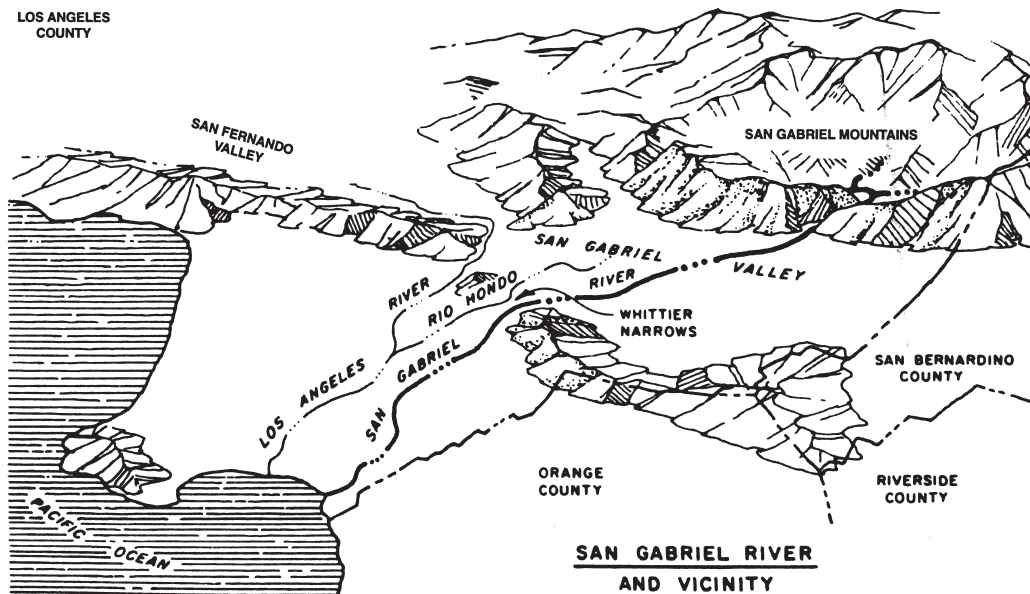
OF THE

SAN GABRIEL RIVER WATERMASTER

FOR

WATER YEAR 2022 - 23

60th ANNUAL REPORT - SAN GABRIEL RIVER WATERMASTER WATER YEAR 2022-23



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

February 29, 2024

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

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February 29, 2024

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

Re: Watermaster Report for Water Year 2022-23
Case No. 722647 entered September 24, 1965

Ladies and Gentlemen:

We have the honor of submitting the Sixtieth Annual Report of the San Gabriel River Watermaster for the water year ending September 30, 2023, 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 average precipitation at the four stations used to represent the San Gabriel Valley rainfall for 2022-23 was 37.5 inches or 203 percent of the long-term average annual rainfall of 18.52 inches as defined in the Judgment. The ten-year average rainfall from 2013-14 through 2022-23 amounted to 15.5 inches, which, according to Table A of the Judgment, established the Lower Area Annual Entitlement at 75,600 acre-feet for 2022-23.

The principal findings of the Watermaster under annual accounting for the water year 2022-23 are as follows:

	<u>Acre-Feet</u>
1. Lower Area Entitlement	75,600
2. Usable Water received by Lower Area in 2022-23	<u>231,895</u>
3. Upper Area Credit for Water Year 2022-23	156,295

4.	Accrued Credit of Upper Area as of September 30, 2022	240,277
5.	Amount of Make-up Water received by Lower Area in 2022-23	0
6.	Accrued Credit of Upper Area as of September 30, 2023	396,572
7.	Amount of Make-up Water required to be delivered prior to October 1, 2024	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 is gratefully acknowledged.

Sincerely,

SAN GABRIEL RIVER WATERMASTER

By:



Robert P. Ghirelli



Stephen B. Johnson



Richard A. Rhone

Enclosures

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CHAPTER I. ACTIVITIES OF WATERMASTER

This Report is for the sixtieth 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 of this Report. The Judgment declared that the Lower Area of the San Gabriel River System, the area downstream of Whittier Narrows, is entitled to receive a long-term 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 forty-sixth annual report on the occasion of the Third 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 Report presenting the required determinations and findings, evaluation and maintenance of monitoring locations, 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.

During the water year 2018-19, the Water Replenishment District of Southern California (WRD), who manages the Central Basin Groundwater Basin, intervened in the case and upon approval of the three plaintiff parties and the Court, took over the plaintiff's responsibilities for the Lower Area.

Administration

The official office and depository of records of the Watermaster is 861 S. Village Oaks Drive, Suite 100, California 91724.

An audit of income and expenditures of the Watermaster for water year 2022-23 was performed by the firm of Egan & Egan, Certified Public Accountants (Egan). Table 1 is the Statement of Income and Expenditures for water year 2022-23 based on the Egan letter of January 18, 2024, which is included commencing on page A-2 of the Appendix of this Report.

TABLE 1
STATEMENT OF INCOME AND EXPENDITURES
FOR THE WATER YEAR 2022-23

Carried forward from water year 2021-22	\$74,735.09
Income from 2022-23 assessments	\$197,000.00
Interest Income	<u>\$16.89</u>
Total Income	\$271,751.98
Expenditures:	
1. Administrative fees and general operating expenses	\$19,811.27
2. Collection of data, field inspections and maintenance of records	\$119,906.50
3. Calculations and preparation of Watermaster Report for water year 2021-22	\$42,979.72
4. Printing and reproduction costs	\$6,063.62
5. Conservancy and Master Planning	<u>\$5,539.00</u>
Total expenditures	\$194,300.11
Balance	\$77,451.87*

*The balance will be used next water year to reflect the budgeted newly drilled monitoring well.

The tentative budget for the current water year 2023-24 was mailed to all Parties on July 13, 2023. 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 annual budget for water year 2023-24 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.

Upper Area Watermaster

Mr. Stetson passed away on April 14, 2011. Mr. Stephen B. Johnson (Stetson Engineers Inc.) was nominated by the Upper Area Parties. On September 15, 2011, Mr. Johnson was appointed by the Court to replace Mr. Stetson as a member of Watermaster.

Lower Area Watermaster

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 (GEI Consultants, Inc.) to replace Mr. Bookman. This appointment was effective in February 1986.

Upper Area/Lower Area Watermaster

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

TABLE 2
WATERMASTER BUDGET
FOR
WATER YEAR 2023-24

1.	Administrative costs and general operating expenses	\$25,000.00
2.	Hydrologic analyses, collection of data and field inspection	\$100,000.00
3.	Additionally needed facilities	\$40,000.00
4.	Calculations and preparation of Watermaster Report for Water Year 2022-23	\$65,000.00
5.	San Gabriel River Conservancy and Master Planning	\$4,000.00
6.	Printing and reproduction costs	\$5,000.00
7.	Contingencies	<u>\$2,000.00</u>
	Total	\$241,000.00
	Surplus carried forward from 2022-23	\$44,000.00
	Less estimated interest income	<u>\$0.00</u>
	Amount to be financed for 2023-24	\$197,000.00

Proration to Parties for Payment

Upper San Gabriel Valley Municipal Water District	50.0%	\$98,500.00
Water Replenishment District of Southern California	50.0%	<u>\$98,500.00</u>
Total	100%	\$197,000.00

replacement effective February 7, 1985.

Mr. Haile passed away on December 9, 2001. Pursuant to the Judgment, Mr. Glenn A. Brown was jointly nominated by Central Municipal and Upper District as the third member of Watermaster. On July 26, 2002, Mr. Glenn A. Brown was appointed by the Court as the third member of Watermaster.

Mr. Brown passed away on February 22, 2015. Pursuant to the Judgment, Mr. Robert P. Ghirelli was jointly nominated by Central Municipal and Upper District as the third member of the Watermaster. On March 4, 2016, Mr. Robert P. Ghirelli was appointed by the Court as the third member of Watermaster.

The staff work for this Report was conducted by Erika Gomez for GEI Consultants, Inc. and Jenny Savron and Mayra Lopez for Stetson Engineers Inc.

Data Collection

The Watermaster collects data on streamflow, rainfall, water quality, ground water levels, export of ground water through Whittier Narrows, recycled 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 records were obtained from the County and 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. The Watermaster acknowledges the County personnel for its emphasis on the quality of the records it produces.

Other data were obtained from the Metropolitan Water District of Southern California (Metropolitan), the County Sanitation Districts of Los Angeles County (County Sanitation District), the Water Replenishment District of Southern California (Water Replenishment

District), the Upper District, the San Gabriel Valley Municipal Water District, the San Gabriel Valley Water Company, the Main San Gabriel Basin Watermaster, the U. S. Army Corps of Engineers, California Department of Toxic Substances Control (DTSC) and the U. S. Geological Survey (USGS). The Watermaster makes use of water level measurements in wells collected by University of Southern California staff on behalf of the San Gabriel Valley Protective Association.

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

Quarterly Field Inspections

During water year 2022-23, Watermaster staff made quarterly field inspections of gaging stations and other facilities. Facilities inspected included the spreading grounds, stream gaging stations, imported water delivery points and river channels in the San Gabriel River system. Watermaster staff also measured the depth to water in a number of wells in the Whittier Narrows area to obtain data for the calculation of annual subsurface flow through Whittier Narrows. The quarterly inspections are coordinated with the water level measuring program conducted on behalf of San Gabriel Valley Protective Association. Watermaster staff began taking stream flow measurements in July 2008 to supplement stream flow records collected by the County through the Whittier Narrows.

Preparation of Annual Report

One of the required responsibilities 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.

Terminology

The Judgment defines numerous terms and those defined terms used in this Report are capitalized. The Judgment defines the term “Reclaimed Water” and this Report uses that defined term when referring to accounting provisions of the Judgment. Otherwise, this Report uses the term “recycled water” (based on current terminology, but synonymous with reclaimed water) when referring to the product water from a water reclamation plant.

Planning Activities of the San Gabriel River Watermaster

Increasing interest in the environment of the San Gabriel River system has resulted in several efforts to study, change and improve the area of the San Gabriel River system. Some of these efforts have resulted in the involvement of the San Gabriel River Watermaster.

San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy

The California State Legislature in 1999 (SB 216) formed the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy. The Conservancy is empowered to acquire and manage specified lands within the Main San Gabriel Basin, the watershed of the San Gabriel River and its tributaries, the Lower Los Angeles River and its tributaries, and the San Gabriel Mountains, to carryout the management, powers, and duties of the Conservancy, as specified by the legislation. The enabling legislation establishing the Conservancy created a Board of Directors of 13 voting members and seven ex officio non-voting members. The legislation specified that a member of the San Gabriel River Watermaster be appointed as one of the non-voting members. Mr. Stephen Johnson was appointed by the Watermaster as its representative on the Conservancy. Mr. Stan Chen was appointed as alternate.

Stream Gaging Stations

The County and the USGS operate the stream gaging stations on the San Gabriel River System. Data from these operations are essential for determinations required of the Watermaster.

The accuracy of these gaging station measurements, at 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.

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.

Memorandum of Understanding (1982)

On May 13, 1982, a Memorandum of Understanding (MOU) 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 MOU was to institute, under then-present conditions, certain practical accommodations which are not intended to constitute interpretations of or additions to the Judgment. The MOU is still in effect and is included in the Appendix to the Forty-sixth Annual Watermaster Report.

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

During water year 2022-23, there were no changes of address or changes of names of Parties reported to the Watermaster.

Water Replenishment District of Southern California

As previously reported, during water year 2018-19, WRD, who manages the Central Basin Groundwater Basin, intervened in the case and upon approval of the three plaintiff parties and the Court, took over the plaintiff's responsibilities for the lower area. WRD petitioned the Court "...to replace Central Basin Municipal Water District, Board of Water Commissioners of the City of Long Beach, and City of Compton as Plaintiffs ("Motion") and to amend the Judgment in the matter captioned Board of Water Commissioners of City Long Beach, et al. v. San Gabriel Valley Water Company, et al., Los Angeles Superior Court, Case No. 722647...." The Lower Area Parties agreed with the Stipulation, which was approved by Judge Maureen Duffy-Lewis on May 30, 2019 and became effective following execution by the Lower Area Parties and WRD. WRD assumes the Lower Area responsibilities, including payment of the expenses on behalf of the Lower Area Parties which were previously paid by the Central Basin Municipal Water District and the cities of Long Beach and Compton.

The address for WRD is 4040 Paramount Blvd, Lakewood, CA 90712.

CHAPTER II. LOWER AREA ANNUAL ENTITLEMENT

The Lower Area Annual Entitlement for water year 2022-23 is based on the average annual rainfall which occurred in the 10-year period ending September 30, 2023 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, Pomona, El Monte and Pasadena.

Rainfall

Rainfall records at Stations 95 (San Dimas) and 108D (El Monte) were determined to be inaccurate in years prior to water year 2007-08 when compared to other adjacent rainfall stations and required adjustments as noted in prior reports. During water year 2006-07, Watermaster provided funds for the County to construct two automatic rain gages located adjacent to Stations 95 and 108D to insure more complete and accurate records.

Station 95 (San Dimas) was relocated by approximately 0.1 miles in August 2017. The station was renumbered to be Station 95A and adopted by the County as part of its four-station index for the San Gabriel Valley. This is documented in the memorandum “Replacement of Station 95” dated December 28, 2018, which is available at the Watermaster office and included by reference.

In a memorandum dated December 22, 2023 titled “Recommended Modifications to Reported Rainfall Records for Water Year 2022-23” the inspection of rainfall data for water year 2022-23 indicated storm events were missing or had over-reported rainfall based upon records at other surrounding stations in the San Gabriel Valley. The Watermaster made a revision to Station 108D by subtracting 1.58 inches to its rainfall total. The Watermaster made a

revision to Station 610B by subtracting 0.18 inches to its rainfall total.

Rainfall during water year 2022-23 at the four stations was measured as follows:

<u>Station Number</u>	<u>Location</u>	<u>Depth of Rainfall in Inches</u>
95A†	198 Pony Express Way, San Dimas	38.34
108D	3615 North Santa Anita Avenue, El Monte	30.36 *
356D†	Pomona Fire Station	33.75
610B	City Hall, Pasadena	<u>47.71</u> *
Four Station Average Rainfall		37.54

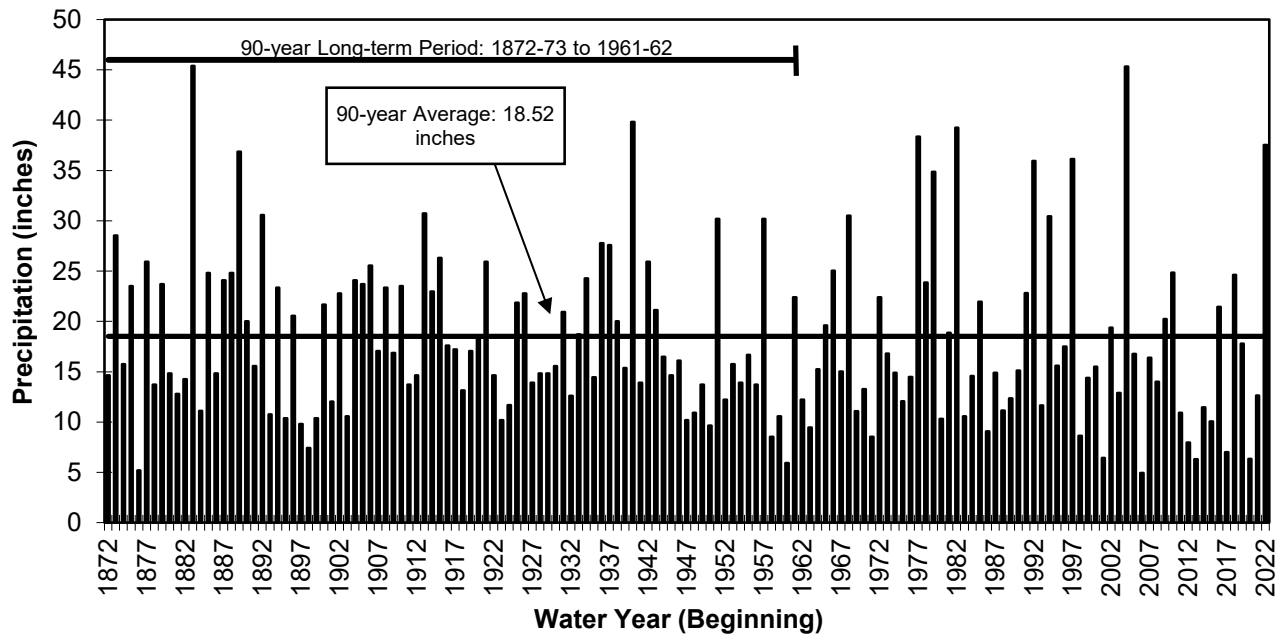
*Data adjusted from recorded amounts to correct apparent inaccurate records

† Station 102D was replaced in 2000-01 by 356C (see Thirty-Eighth Annual Report). Station 356C was replaced by Station 356D in 2014-15. Station 95 was moved in 2016-17 and renumbered Station 95A.

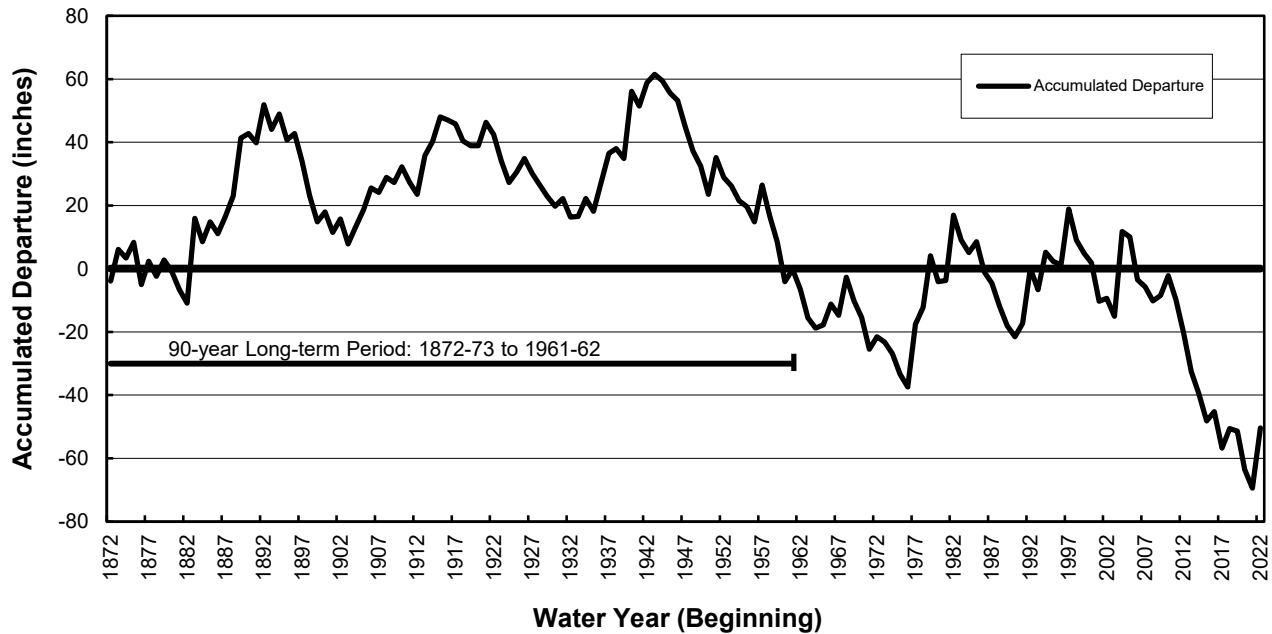
Measured rainfall during water year 2022-23 averaged 37.54 inches in the San Gabriel Valley, or 203 percent of the long-term average. Shown in the top graph of Figure 1 is a graphical representation of the annual measured rainfall since water year 1872-73. The Judgment is based on an average annual rainfall of 18.52 inches for the 90-year period from 1872-73 through 1961-62, which is also shown in the top graph in Figure 1. Presented in the lower graph of Figure 1 is the accumulated departure from the average annual rainfall. The graph shows when extended periods of above and below average annual precipitation occurred. An example of an extended period of above average annual precipitation is water years 1977-78 through 1982-83. An example of an extended below average annual precipitation is water

FIGURE 1

**SAN GABRIEL VALLEY PRECIPITATION
1872-73 THROUGH 2022-23**



**SAN GABRIEL VALLEY ACCUMULATED DEPARTURE
1872-73 THROUGH 2022-23**



**HISTORICAL PRECIPITATION
IN THE SAN GABRIEL VALLEY**

years 1943-44 through 1976-77. During this dry period, the average rainfall was 15.69 inches, or 85 percent of the 90-year period. The first three dry periods shown ending in water year 1976-77 covered 60 years and had an average rainfall of 15.82 inches or 85 percent of the 90-year period. The San Gabriel Valley experienced the lowest average annual rainfall during the 5-year period of water years 2011-12 through 2015-16 and the 11-year period of water years 2011-12 through 2021-22. During the 5-year period, the average annual rainfall was 9.33 inches or 50 percent of the 90-year period; and during the 11-year period the average annual rainfall was 12.41 inches or 67 percent of the 90-year period. This indicates that the annual rainfall in the San Gabriel Valley in the recent dry periods is about 3 inches less than earlier dry periods and about two-thirds of the 90-year average rainfall. This also indicates that the dry periods are becoming drier, which is consistent with what is observed in other areas of the west. The average rainfall during the operational period of the Watermaster, water years 1963-64 through 2022-23, was 17.79 inches, or 96 percent of the 90-year period. This shows that the average annual precipitation since 1963-64 is about one inch less than the 90-year period used for the Judgment.

Table 3 presents the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 2013-14 through 2022-23, as 15.5 inches.

TABLE 3

**AVERAGE ANNUAL RAINFALL IN SAN GABRIEL VALLEY
2013-14 THROUGH 2022-23**

Water Year	Annual Precipitation Rainfall
2013-14	6.3
2014-15	11.4
2015-16	10.1
2016-17	21.4
2017-18	7.0
2018-19	24.6
2019-20	17.8
2020-21	6.3
2021-22	12.6
2022-23	<u>37.5</u>
Total	155.1
10-Year Average*	15.5

*The 10-year average is 84 percent of the 90-year average of 18.52 inches.

Lower Area Annual Entitlement

Based on the 10-Year average rainfall of 15.5 inches, the Lower Area Annual Entitlement for the water year 2022-23 is 75,600 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 water year 2022-23. Also included is a discussion of the quality of water of the San Gabriel River system.

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 gaging station measured flows and estimated flows are described below. The Judgment provides for adjustments to the measured flows where applicable. Some measurements during water year 2022-23 were found to be unreliable, questionable, or in error and appropriate adjustments were made by Watermaster. These adjustments are discussed later in this chapter, under the heading “Adjustments to Surface Flow.”

Rio Hondo Above Mission Bridge, Station F64

In August of 1978, the flow recorder at this Station was removed by the County due to high maintenance costs and very poor hydraulic control caused by a shifting sand bottom at the Station. Also, the use of Whittier Narrows for storage of storm waters for conservation purposes causes frequent backwater at the Station during storm operations. After reinstallation of the gaging station in 1985, the County again removed the recorder at this Station in 1995. Since 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 that is considered to be more accurate than the recorder. This is due to the poor conditions of the channel section at the Station and

backwater conditions from Whittier Narrows Dam and Whittier Narrows Water Reclamation Plant discharges.

During water year 2022-23, the County hydrographer did not perform any current-meter measurements. During water year 2022-23 the Watermaster staff performed 4 current-meter measurements.

The Watermaster has determined that a synthesized flow at Station F64 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), plus an estimate of the quantity of rising water. Watermaster determined when there was no precipitation and releases were made from Peck Road Spreading Grounds, there were periods when the flow measured at Garvey Avenue was incorrect. During these periods of time, the Watermaster substituted the flow at Lower Azusa Road (F192B-R), or when Lower Azusa Road (F192B-R) appears incorrect, the Watermaster used the Rio Hondo Spreading Ground inflow, loss in the Whittier Narrows Reservoir, less inflow from the Whittier Narrows Flood Flow Channel (G44B-R), less inflow from the Rio Hondo By-Pass Channel (Zone I Ditch) and less inflow from Whittier Narrows Reclamation Plant to synthesize the flow at F64. The synthesized flow at Station F64 is utilized for the entire water year and it is considered to be reasonably accurate. This resulted in a total flow at Station F64 for water year 2022-23 of 98,960 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 in this chapter,

under the heading "Adjustments to Surface Flow."

Mission Creek at San Gabriel Boulevard, Station F83

The recorder was removed by the County 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. Historically, the majority of the water carried in Mission Creek was rising water. For a number of years there was no flow observed at this Station during quarterly field inspection. During quarterly field inspections Watermaster staff observed flow in Mission Creek beginning in February 2013 and continuing through the end of May 2015. The flow in Mission Creek is attributed to the discharge of treated water from the Department of Toxic Substances Control (DTSC) Whittier Narrows Operable Unit Treatment Facility to Legg Lake beginning February 2, 2013. The increased discharge to Legg Lake resulted in an outflow from Legg Lake and subsequent flow into Mission Creek.

In a letter dated November 4, 2015, the Main San Gabriel Basin Watermaster and the Water Replenishment District agreed to the accounting of flows in Mission Creek which Watermaster measures at Station F83. (The letter agreement is included in the fifty-third Annual Report.) Such flows will be considered "Lower Area Replenishment Water", as described later in this Report.

During water year 2022-23, Watermaster staff performed 12 streamflow measurements on Mission Creek at the former location of Station F83. In addition, Watermaster staff obtained data on the treated water discharge to Legg Lake for water year 2022-23 from DTSC. The stream flow measurements were correlated with the discharge of treated water to Legg Lake. This relationship was used to develop an estimate of daily flow

in Mission Creek for water year 2022-23. During October 1, 2022 through September 30, 2023, DTSC reported production from WNOU treatment plant to Legg Lake decreased from about 2,400 gpm to about 1,000 gpm (due to vandalism at the wells), which caused the excess water to Mission Creek to cease. Watermaster staff confirmed during field visits there was no flow in Mission Creek. Therefore, the total flow in Mission Creek, Station F83, for water year 2022-23 was determined to be 0 acre-feet.

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

The Zone I Ditch, Station F313B-R, is equipped with a Parshall flume. The measured flow at Zone I Ditch for water year 2022-23 was 6,050 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. The County, in 1993, established a gaging station utilizing the stabilizer weir with a recorder and has designated the Whittier Narrows Flood Channel as Station G44B-R. Typically, the Watermaster utilizes records developed by the County and verifies the data utilizing a weir formula and records of reservoir stage obtained from the Corps of Engineers, operators of Whittier Narrows Reservoir. In general, these comparisons have provided reasonably accurate data. For water year 2022-23, the mean daily discharge measurements at Station G44B-R were generally consistent with flow estimates using weir flow calculations

and, thus, confirm the method used. The flow through the Flood Channel, Station G44B-R, for water year 2022-23 was measured by the County as 31,830 acre-feet.

Sycamore Canyon

As specified in Exhibit B of the Judgment, 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 (Rio Hondo above Mission Bridge). During water year 2017-18, the County notified Watermaster staff rainfall records at Station 170F were discontinued as of the end of August 2017. Rainfall for the month of September 2017 was estimated based on surrounding stations within the vicinity of Station 170F. The memorandum “Replacement of Measuring Station – Precipitation Station 170F” provides a recommendation of Station 1114B as the replacement for Station 170F. Watermaster selected Station 1114B to be the replacement station for Station 170F. During water year 2022-23, rainfall at Sycamore Canyon, Station 1114B, was measured at 28.87 inches. Table 6 of Exhibit B to the Judgment, presents the runoff at Sycamore Canyon for annual rainfall of 6 inches and above. Based upon Table 6 of Exhibit B of the Judgment, the runoff from Sycamore Canyon was determined to be 630 acre-feet.

San Gabriel River Below Parkway Bridge, Station F263C-R

The flow in the San Gabriel River below Parkway Bridge, Station F263C-R, for water year 2022-23 was recorded by the County to be 118,000 acre-feet. The Watermaster revised the flow to 111,700 acre-feet based on analysis of daily flow.

San Gabriel River at Florence Avenue, Station F262C-R

The Station is located about one mile downstream from Station F262B-R 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 the San Gabriel River at Florence Avenue, Station F262C-R, for water year 2022-23 was recorded by the County to be 41,050 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 on the Rio Hondo 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 meter 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 performed successfully. There were periods of time during which the records of Spreading Grounds inflow did not exist or were not accurate. The County installed a Flodar measuring device in February 2006. However, the measuring device is inaccurate when flow depth in the pipe is less than three feet. The County intended to replace this device in 2007 with a Flodar

measuring device with a full operating range for the 102-inch diameter pipe at a location downstream of the turbulence. The County installed a Flodar measuring device in 2011, which began service on September 14, 2011. However, as a result of insufficient flow and subsequent vandalism, the Flodar measuring device was never placed into service.

When the low level intake meter is inoperative, the mean daily flow is estimated by County personnel using a rating table of the slide gate and forebay pool elevation. The Watermaster continues to evaluate records for the low level intake. Other intakes to the Spreading Grounds are equipped with Parshall flumes and recorders.

Reclaimed Water Delivered to Rio Hondo Below Station F64

Reclaimed Water from the Whittier Narrows Water Reclamation Plant can be delivered to the San Gabriel River, the Rio Hondo below Station F64, or the Rio Hondo Bypass Channel (Zone I Ditch). The total water production from this plant was 10,151 acre-feet during water year 2022-23, of which 1,250 acre-feet was used at other sites near the plant site, resulting in net release for groundwater replenishment of 8,901 acre-feet. Of this quantity, 5,734 acre-feet was delivered directly to the Rio Hondo below Station F64 and is added as Surface Flow.

In addition, 1,949 acre-feet of Reclaimed Water from the Whittier Narrows Plant 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 water year 2022-23, 1,218 acre-feet of Reclaimed Water 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 replenishment. This outlet is located downstream of Station F263C-R and is equipped with a propeller meter.

During water year 2022-23, 31,188 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 and 4,502 acre-feet of Reclaimed Water was recharged from WRD's Advanced Water Treatment Plant. Consequently, a total of 35,690 acre-feet of Reclaimed Water was delivered below Station F263C-R.

The flow in the San Jose Creek outfall pipeline, which is not diverted for replenishment use, is delivered to the lined portion of the San Gabriel River and flows to the ocean. During water year 2022-23, such flow amounted to approximately 1,513 acre-feet and is not included as Surface Flow under the Judgment.

A second turnout for replenishment purposes from the San Jose Creek Water Reclamation Plant was first used in December 1986 to provide the option of releasing

Reclaimed Water directly to the San Jose Diversion Channel, upstream of the San Gabriel River. San Jose Creek Water Reclamation 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. For water year 2022-23, 8,360 acre-feet of Reclaimed Water was released through the San Jose Creek Water Reclamation Plant Stages I and II for replenishment by the Lower Area.

A third turnout for replenishment purposes from the San Jose Plant was installed with expansion of Stage III of the San Jose Creek Water Reclamation Plant. Effluent from Stage III can be delivered to the aforementioned outfall pipeline or delivered directly to the San Gabriel River at the Plant. This flow will commingle with Reclaimed Water delivered to the San Jose diversion channel 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 water year 2022-23, no Reclaimed Water was released to the San Gabriel River at this location.

In addition, a fourth turnout for replenishment purposes from the San Jose Plant was installed. Tertiary-treated recycled water from the San Jose Creek Water Reclamation Plant is diverted from the San Jose Creek Outfall line to the Water Replenishment District's Albert Robles Center (ARC) Advanced Water Treatment Facility (AWTF). Product water from the ARC AWTF is returned to the Outfall and delivered to the San Gabriel Coastal Spreading Grounds for groundwater replenishment. Brine and other waste from the AWTF processes is returned to the sewer and directed to the County Sanitation District Joint Water Pollution Control Plant in Carson. For water year 2022-23, the AWTF recharged 4,502 acre-feet.

For water year 2022-23, a total of 39,548 acre-feet of Reclaimed Water was released from the San Jose Creek Water Reclamation Plant for groundwater replenishment. A part of this Reclaimed Water may flow to the ocean and is then accounted for as described later in this chapter, under the heading "Unusable Surface Flow". During water year 2022-23, 1,513

acre-feet of Reclaimed Water flowed to the ocean.

Adjustments to Surface Flow

The quantity of Surface Flow is, essentially, based upon streamflow measurements made by the County. The method set forth in the Judgment is to measure the surface inflow to the Lower Area through Whittier Narrows and deduct that portion of surface flow which leaves the Montebello Forebay at its lower end. The difference in these measurements represents determination of the quantity of Surface Flow which infiltrates to the Montebello Forebay as Usable Water (see Table 4 for details).

High runoff conditions occur during and following certain storms. 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 shorter duration.

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 water year 2022-23, Watermaster determined it was appropriate 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 57 days of water year 2022-23. These days were November 8, 9; December 11, 12, 31, March 1-7, 9-13, 15, 17-31; April 1, 2, 4-8, 12, 19-29, May 4,5; June 1, and August 20,21. The unadjusted inflow to the Lower Area in the Rio Hondo as set forth in Table 4 was 52,598 acre-feet during those 57 days. There was 15,967 acre-feet of outflow to the ocean during the same 57 days (calculated on a daily basis from stream gaging measurements as provided in the Judgment). (This latter value is Unusable Surface Flow from the Upper Area.) In making the adjustment, the unusable outflow as measured at the Rio Hondo Headworks and compared to flow at Station F45B-R (Stewart and Gray Road) was accepted.

The infiltration during the 57 days was calculated to be 38,914 acre-feet. This

included the amount of water 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 decreased by 1,881 acre-feet during those 57 days. The inflow is therefore adjusted by adding the quantity of infiltration (38,914 acre-feet) to the outflow (15,967 acre-feet) and adding the decrease in storage (1,881 acre-feet) to determine the adjusted inflow in the amount of 53,000 acre-feet.

TABLE 4

**LOWER AREA INFLOW AND OUTFLOW
ADJUSTMENT TO RIO HONDO INFLOW**

	:	Amounts in Acre-Feet
	:	For 57 Days ^(a) of the
Item	:	Water Year 2022-23

A. UNADJUSTED INFLOW

Rio Hondo Above Mission Bridge, F64	32,670	
Mission Creek at San Gabriel Boulevard, F83	0	
Rio Hondo By-Pass Channel (Zone I Ditch)	1,851	
Whittier Narrows Flood Channel	16,581	
Sycamore Canyon	303	
Ungaged Recycled Water (WNWRP)	1,193	
Total Unadjusted Inflow		52,598

B. ADJUSTED INFLOW

Infiltration		
Spreading grounds infiltration	32,567	
Reservoir area infiltration	6,347	
Total infiltration		38,914
Change in Reservoir Storage		-1,881
Outflow at Stewart and Gray Road		<u>15,967</u>
Total Adjusted Inflow		53,000

C. ADJUSTMENT

Adjustment to Rio Hondo Inflow	<u>+402</u>
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(a) Days adjusted were November 8, 9; December 11, 12, 31, March 1-7, 9-13, 15, 17-31; April 1, 2, 4-8, 12, 19-29, May 4,5; June 1, and August 20,21

As shown on Table 4, the adjustment to the Rio Hondo inflow is plus 402 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 290,996 acre-feet of surface water flowed through Whittier Narrows during water year 2022-23. Table 5 shows the components and the total Surface Flow.

TABLE 5
SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS
FOR WATER YEAR 2022-23

	<u>Amount in Acre-Feet</u>
Rio Hondo above Mission Bridge, Station F64	98,960
Mission Creek at San Gabriel Boulevard, Station F83	0
Rio Hondo By-Pass Channel, Station F313B-R	6,050
Whittier Narrows Flood Channel	31,830
Sycamore Canyon	630
San Gabriel River below Parkway Bridge, Station F263C-R	111,700
Reclaimed Water from Whittier Narrows Plant Delivered to Rio Hondo below Station F64	5,734
Reclaimed Water from San Jose Plant Delivered to San Gabriel River below Station F263C-R (includes AWTF Water)	35,690
Plus Adjustment to Rio Hondo Inflow (Table 4)	<u>+402</u>
Total Surface Flow	290,996

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.

To prepare estimates of Subsurface Flow through Whittier Narrows the Watermaster prepares contour maps of water levels in wells for the spring and fall of each year. To prepare these maps the Watermaster uses water level measurements collected by the University of Southern California (USC), Cross Connection Laboratory, on behalf of the San Gabriel Valley Protective Association. The Watermaster also measures a number of wells on a quarterly basis, coordinating the efforts with USC. In addition, the Watermaster has replaced 8 wells in critical areas and also placed a casing in a collapsing well that was at a critical location.

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 water year 2022-23 which amounted to 35,300 acre-feet.

Time	Subsurface Flow in Acre-Feet
Spring 2021	39,900
Fall 2021	33,300
Spring 2022	49,500
Fall 2022	40,300
Spring 2023	20,800
Fall 2023	<u>28,000</u>
Subsurface Flow 2022-23	35,300

Export to Lower Area

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

During the water year 2022-23, there were four entities which transported water by pipeline through Whittier Narrows. All of the water exported through the Narrows was groundwater 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	18,895
San Gabriel Valley Water Company	1,544
Suburban Water Systems	11,178
City of Whittier	<u>805</u>
Total	32,422

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 Metropolitan. This

imported water may be delivered at two Metropolitan connections: (1) Foothill Feeder at San Dimas Wash (CenB-48) and (2) Upper Feeder at Thompson Creek (CenB-28). Both connections are metered and delivered amounts are recorded by Metropolitan. These amounts are verified by the County.

During water year 2022-23, there was no imported water purchased from Metropolitan for replenishment on behalf of the Lower Area.

MWD Connection	Imported Water (Acre-Feet)
San Dimas Wash (CenB-48)	0
Thompson Creek (CenB-28)	<u>0</u>
Total	0

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 the San Gabriel Valley to Whittier Narrows. As there was no imported replenishment water delivered during water year 2022-23, there was no evaporation to consider.

In addition, pursuant to an agreement between the Main San Gabriel Basin Watermaster and the Water Replenishment District, 0 acre-feet of flow from the WNOU treatment plant may be accounted for as Lower Area Replenishment Water.

Analysis of daily flows indicated that there was no imported water loss to the ocean for water year 2022-23. Therefore, the total amount of Lower Area Replenishment Water amounted to 0 acre-feet.

Reclaimed Water

Recycled water used for replenishment of the Montebello Forebay came from three separate plants, each of which is operated by the County Sanitation Districts. Effective July 1, 2013, the County Sanitation District and the Water Replenishment District entered into a long-term contract for delivery of recycled water from the three plants.

Whittier Narrows Water Reclamation Plant

The total amount of recycled water produced at the Whittier Narrows Water Reclamation Plant during the water year 2022-23, and delivered to stream channels, was 8,901 acre-feet. During water year 2022-23, 828 acre-feet of Whittier Narrows effluent was bypassed to the ocean during storm operations. Therefore, a total of 8,073 acre-feet of Reclaimed Water from the Whittier Narrows Water Reclamation Plant was purchased by the Water Replenishment District of Southern California for replenishment in the Montebello Forebay.

Pomona Water Reclamation Plant

The total production at the Pomona Water Reclamation Plant during the water year 2022-23 was 7,423 acre-feet. A portion of the effluent was delivered to the City of Pomona for resale. The undelivered portion, amounting to 4,108 acre-feet, was delivered to San Jose Creek. It was determined that 466 acre-feet of Reclaimed Water was bypassed to the ocean, 1,735 acre-feet was replenished in the San Gabriel Valley, and 1,907 acre-feet was replenished 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 1,220 acre-feet, which historically had been accounted for as Reclaimed Water. However, effective July 1, 2013 a new long-term contract was entered into between County Sanitation District

and the Water Replenishment District whereby the Water Replenishment District has agreed to pay for all recycled water from the Pomona Plant that is released to San Jose Wash and is not lost to the ocean. For the purpose of reporting, it is assumed all recycled water released from the Pomona Plant for the entire water year 2022-23 is accounted for as Reclaimed Water, which totals 4,108 acre-feet. However, the accounting of recycled water released from the Pomona Plant between October 1, 2022 and September 30, 2023 may be reevaluated in the Annual Report for water year 2023-24 and a revised calculation will be applied retroactively to water year 2022-23 calculations based on the Judgment.

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 water year 2022-23, 39,548 acre-feet of Reclaimed Water from the San Jose Creek Water Reclamation Plant was delivered to the Lower Area for replenishment, which also includes advanced treated water from WRD's AWTF. The amount of Reclaimed Water bypassed that was included as surface outflow during the water year 2022-23 totaled 1,513 acre-feet. Therefore, a total of 38,035 acre-feet of such Reclaimed Water was purchased by the Lower Area for replenishment in the Montebello Forebay. Total plant effluent for the water year 2022-23 was about 69,000 acre-feet.

Summary of Reclaimed Water

The total amount of Reclaimed Water deducted from the inflow is 50,216 acre-feet for the water year 2022-23. This is comprised of 8,073 acre-feet from the Whittier Narrows Water Reclamation Plant, 4,108 acre-feet from the Pomona Water Reclamation Plant, and 38,035 acre-feet from the San Jose Creek Water Reclamation Plant.

Make-up Water by Surface Flow Delivery

During water year 2022-23, 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 water year 2022-23.

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.

As determined by the Watermaster, the measured surface outflow from the Montebello Forebay in the Rio Hondo at Station F45B-R was 33,450 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 a synthesized Montebello Storm Drain flow. The Montebello Storm Drain flow is synthesized using the record at Alhambra Wash, Station F81D-R. By analysis of flows on days when the

radial gates were open, it was possible to segregate the flow at Station F45B-R into Local Storm Outflow, Unusable Surface Flow and replenishment water. The total flow to the ocean on such days was determined to be 31,770 acre-feet. It was determined that the Local Storm Outflow was 3,868 acre-feet and the Unusable Surface Outflow in the Rio Hondo was 27,900 acre-feet. Unusable Surface Outflow included 1,008 acre-feet of Reclaimed Water. Local Inflow for water year 2022-23 was calculated to be 6,479 acre-feet.

The total flow of the San Gabriel River as measured at Florence Ave., Station F262C-R, was measured to be 41,050 acre-feet. Generally, flow consists 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 4,104 acre-feet based on correlation with the Montebello Storm Drain. The Local Storm Outflow on the San Gabriel River during water year 2022-23 was determined to be 1,377 acre-feet. Analysis of daily flows indicated a total Unusable Surface Flow from the Montebello Forebay in the San Gabriel River of 39,680 acre-feet during water year 2022-23. Unusable Surface Flow included 1,799 acre-feet of Reclaimed Water which was previously deducted from Lower Area Reclaimed Water.

The total Unusable Surface Flow passing through the Montebello Forebay in the Rio Hondo and San Gabriel River during water year 2022-23 was 67,580 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 water year 2022-23.

TABLE 6

USABLE WATER FOR WATER YEAR 2022-23

	<u>Amount in Acre-Feet</u>	
Surface Flow	290,996	
Subsurface Flow	35,300	
Credit for Export to Lower Area	<u>23,395</u>	
Subtotal		349,691
Less:		
Lower Area Replenishment Water	0	
Reclaimed Water	50,216	
Make-Up Water by Surface Flow Delivery	0	
Recirculation of Measured Water	0	
Unusable Surface Flow	<u>67,580</u>	
Subtotal		<u>117,796</u>
Usable Water		<u>231,895</u>

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 County Sanitation Districts, the County and Metropolitan. Ground water quality data were also obtained from programs of the Main San Gabriel Basin Watermaster and 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 2, 3 and 4 are graphical trends of salinity, hardness and nitrogen of the sources of imported and Recycled Water for replenishment in the San Gabriel River System.

TABLE 7 (A)

WATER QUALITY ANALYSES REPRESENTATIVE OF SOURCES OF WATER PASSING THROUGH WHITTIER NARROWS WATER YEAR 2022-23 (a)									
CATEGORY	DRINKING WATER STANDARDS	IMPORTED WATER		RECLAIMED WATER				RUNOFF WATER	
		UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT	SAN JOSE CREEK PLANT (E)	SAN JOSE CREEK PLANT STAGE III (W)	POMONA PLANT	STORM FLOW (d)	SUBSURFACE FLOW (e)
DATE		April-23	April-23	June-23	June-23	June-23	June-23	January-23	September-23
pH	6.5-8.5	7.9	8.1	7.3	7.4	7.3	7.2	NA	7.7
EC x 10 ⁶ (umho/cm)	900-1,600	366.0	995.0	NA	NA	NA	NA	ND	870
<u>CATIONS</u>									
Calcium		22	71	48.5	57.0	51.2	68	NA	82.6
Magnesium		8.0	27.0	13.8	13.5	13.8	13	NA	15
Sodium		38	95	124	109	108	105	NA	64
Potassium		2.3	4.7	16.5	17.5	16.3	15.2	NA	NA
<u>ANIONS</u>									
Carbonate		0.0	0.0	ND	ND	ND	ND	NA	ND
Bicarbonate		83	160	149	160	152	141	NA	200
Sulfate	250-500	44	219	94.9	86	71	58.6	NA	120
Chloride	250-500	41	102	104	124	113	147	NA	110
Fluoride	2.0	0.1	0.3	0.62	0.35	0.59	0.25	NA	NA
Total Dissolved Solids	500-1,000	212	608	547	570	530	546	NA	NA
Total Hardness as CaCO ₃		89	290	178	198	185	224	100	268
Boron		0.15	0.14	0.27	0.35	0.35	0.32	NA	NA
<u>INORGANIC TRACE CONSTITUENTS</u>									
Arsenic	0.010	0.002	0.002	ND	0.001	ND	ND	NA	NA
Barium	1.0	0.035	0.120	0.074	0.046	0.039	0.045	NA	NA
Cadmium	0.005	ND	ND	ND	ND	ND	0.001	NA	NA
Chromium, Total	0.050	0.002	ND	0.001	0.001	0.001	0.001	NA	NA
Copper, Total	1.0	ND	ND	0.003	0.003	0.005	0.004	0.017	NA
Lead		ND	ND	ND	ND	ND	0.0003	0.011	NA
Mercury	0.002	ND	ND	0.0000012	0.0000017	0.0000016	0.0000017	NA	NA
Perchlorate	0.006	NA	NA	ND	ND	ND	ND	NA	ND
Selenium	0.050	ND	ND	ND	ND	ND	ND	NA	NA
Silver	0.100	ND	ND	ND	ND	ND	ND	NA	NA
<u>NUTRIENTS as N</u>									
Ammonia		NA	NA	0.4	1.3	1.5	1.2	NA	NA
Nitrate	10	3.2	0.9	5.9	5.9	6.4	8.0	NA	2.1
Nitrite	1.0	NA	NA	0.14	ND	0.09	0.0	NA	NA
Organic Nitrogen		NA	NA	1.1	ND	0.7	1.2	NA	NA

(a) All constituents in mg/l unless noted. ND = None Detected. NA = Not Analyzed or Not Available.

(b) Sampled at Lake Silverwood.

(c) Sampled at Lake Mathews.

(d) At San Gabriel River Parkway.

(e) From Well 2947LM.

TABLE 7 (B)

WATER QUALITY ANALYSES REPRESENTATIVE OF SOURCES OF WATER PASSING THROUGH WHITTIER NARROWS WATER YEAR 2022-23 (a)									
CATEGORY	DRINKING WATER STANDARDS	IMPORTED WATER		RECYCLED WATER				RUNOFF WATER	
		UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT	SAN JOSE CREEK PLANT (E)	SAN JOSE CREEK PLANT STAGE III (W)	POMONA PLANT	STORM FLOW (d)	SUBSURFACE FLOW (e)
DATE		July-22	July-22	June-23	June-23	June-23	June-23	January-23	June-23
PURGEABLE ORGANICS									
Methylene Chloride	5	ND	ND	ND	ND	ND	ND	NA	ND
Chloroform	80 (f)	NA	NA	15.4	53.2	19.2	31.9	NA	ND
Bromodichloromethane	80 (f)	NA	NA	5.9	19.0	8.1	10.0	NA	ND
Dibromochloromethane	80 (f)	NA	NA	1.3	4.2	1.7	1.7	NA	ND
Bromoform	80 (f)	NA	NA	ND	ND	ND	ND	NA	ND
Carbon Tetrachloride	0.5	ND	ND	ND	ND	ND	ND	NA	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dichloroethane	0.5	ND	ND	ND	ND	ND	ND	NA	ND
1,1,1-Trichloroethane	200	ND	ND	ND	ND	ND	ND	NA	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND	ND	ND	NA	ND
1,1-Dichloroethylene	6	ND	ND	ND	ND	ND	ND	NA	ND
Trichloroethylene	5	ND	ND	ND	ND	ND	ND	NA	ND
Tetrachloroethylene	5	ND	ND	ND	ND	ND	ND	NA	ND
Methyl Tertiary-Butyl Ether	13	ND	ND	ND	ND	ND	ND	NA	ND
Benzene	1	ND	ND	ND	ND	ND	ND	NA	ND
Toluene	150	ND	ND	ND	ND	0.5	ND	NA	ND
Chlorobenzene	70	ND	ND	ND	ND	ND	ND	NA	ND
O-Dichlorobenzene	600	ND	ND	ND	ND	ND	ND	NA	ND
M-Dichlorobenzene		ND	ND	ND	ND	ND	ND	NA	ND
P-Dichlorobenzene	5	ND	ND	ND	ND	ND	ND	NA	ND
Cis-1,2-Dichloroethylene	6	ND	ND	ND	ND	ND	ND	NA	ND
Trans-1,2-Dichloroethylene	10	ND	ND	ND	ND	ND	ND	NA	ND
Bromomethane		ND	ND	ND	ND	ND	ND	NA	ND
Chloroethane		NA	NA	ND	ND	ND	ND	NA	ND
2-Chloroethylvinylether		NA	NA	ND	ND	ND	ND	NA	NA
Chloromethane		ND	ND	ND	ND	ND	ND	NA	ND
1,2-Dichloropropane	5	ND	ND	ND	ND	ND	ND	NA	ND
Cis-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	NA	ND
Trans-1,3-Dichloropropene		ND	ND	ND	ND	ND	ND	NA	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	NA	ND
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	ND	NA	ND
NON-PURGEABLE ORGANICS									
Bis(2-ethylhexyl)phthalate	4	NA	NA	ND	ND	ND	ND	NA	NA
1,2,4-Trichlorobenzene	5	ND	ND	ND	ND	ND	ND	NA	ND
2,4,6-Trichlorophenol		NA	NA	ND	ND	ND	ND	NA	NA
2,4,5-Trichlorophenol		NA	NA	ND	ND	ND	ND	NA	NA
2,3,4-Trichlorophenol		NA	NA	ND	ND	ND	ND	NA	NA
2,3,6-Trichlorophenol		NA	NA	ND	ND	ND	ND	NA	NA
3,4,5-Trichlorophenol		NA	NA	ND	ND	ND	ND	NA	NA
Pentachlorophenol	1	NA	NA	ND	ND	ND	ND	NA	NA
Phenanthrene		NA	NA	ND	ND	ND	ND	NA	NA
Fluoranthene		NA	NA	ND	ND	ND	ND	NA	NA
Atrazine	1	NA	NA	NA	ND	ND	ND	NA	NA
Simazine	4	NA	NA	NA	ND	ND	ND	NA	NA
Phenylacetic Acid		NA	NA	ND	ND	ND	ND	NA	NA
Phenol		NA	NA	ND	ND	ND	ND	NA	NA
CHLORINATED HYDROCARBONS									
DDT		NA	NA	ND	ND	ND	ND	NA	NA
BHC		NA	NA	ND	ND	ND	ND	NA	NA
Lindane	0.2	NA	NA	ND	ND	ND	ND	NA	NA
Heptachlor	0.01	NA	NA	ND	ND	ND	ND	NA	NA
Heptachlor Epoxide	0.01	NA	NA	ND	ND	ND	ND	NA	NA
Aldrin		NA	NA	ND	ND	ND	ND	NA	NA
Dieldrin		NA	NA	ND	ND	ND	ND	NA	NA

(a) All constituents in ug/l unless noted. ND = None Detected. NA = Not Analyzed or Not Available.

(b) Sampled at Lake Silverwood.

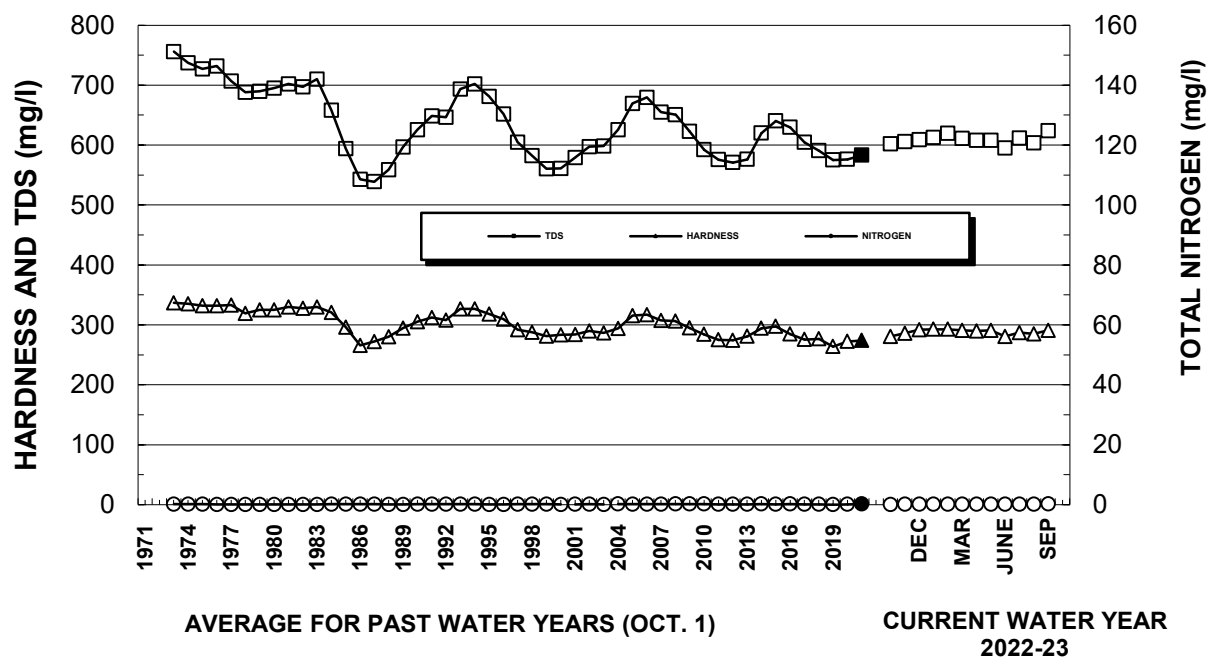
(c) Sampled at Lake Mathews.

(d) At San Gabriel River Parkway.

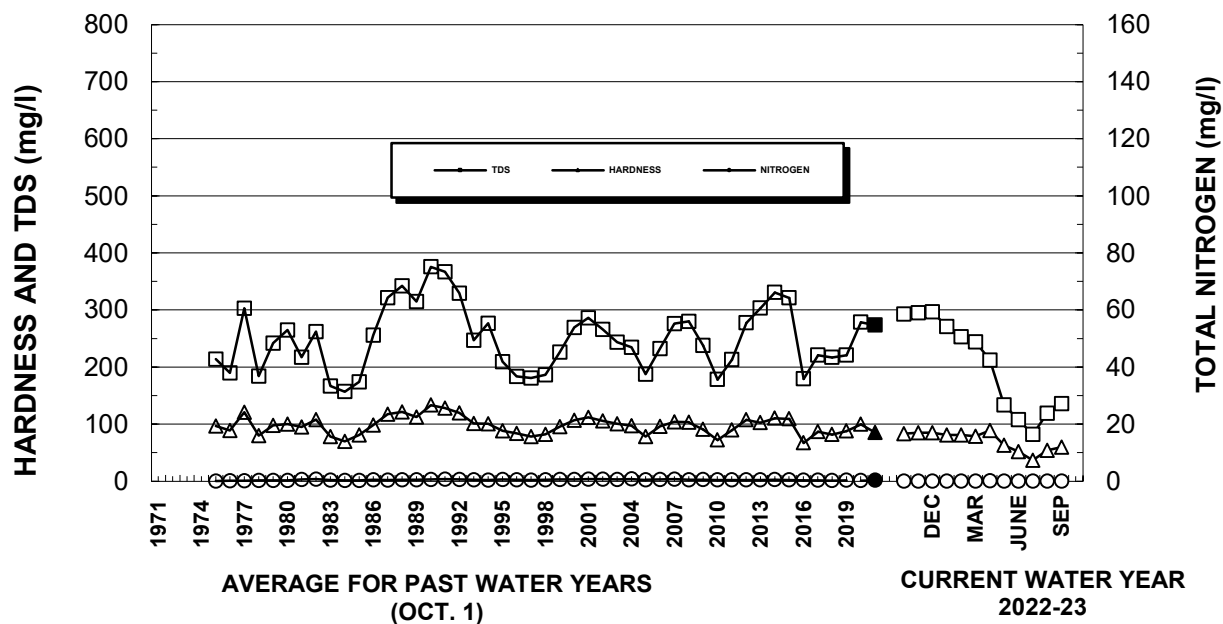
(e) From Well 2947LM.

(f) Total Trihalomethanes is not to exceed 80 ug/l.

UNTREATED COLORADO RIVER WATER LAKE MATTHEWS



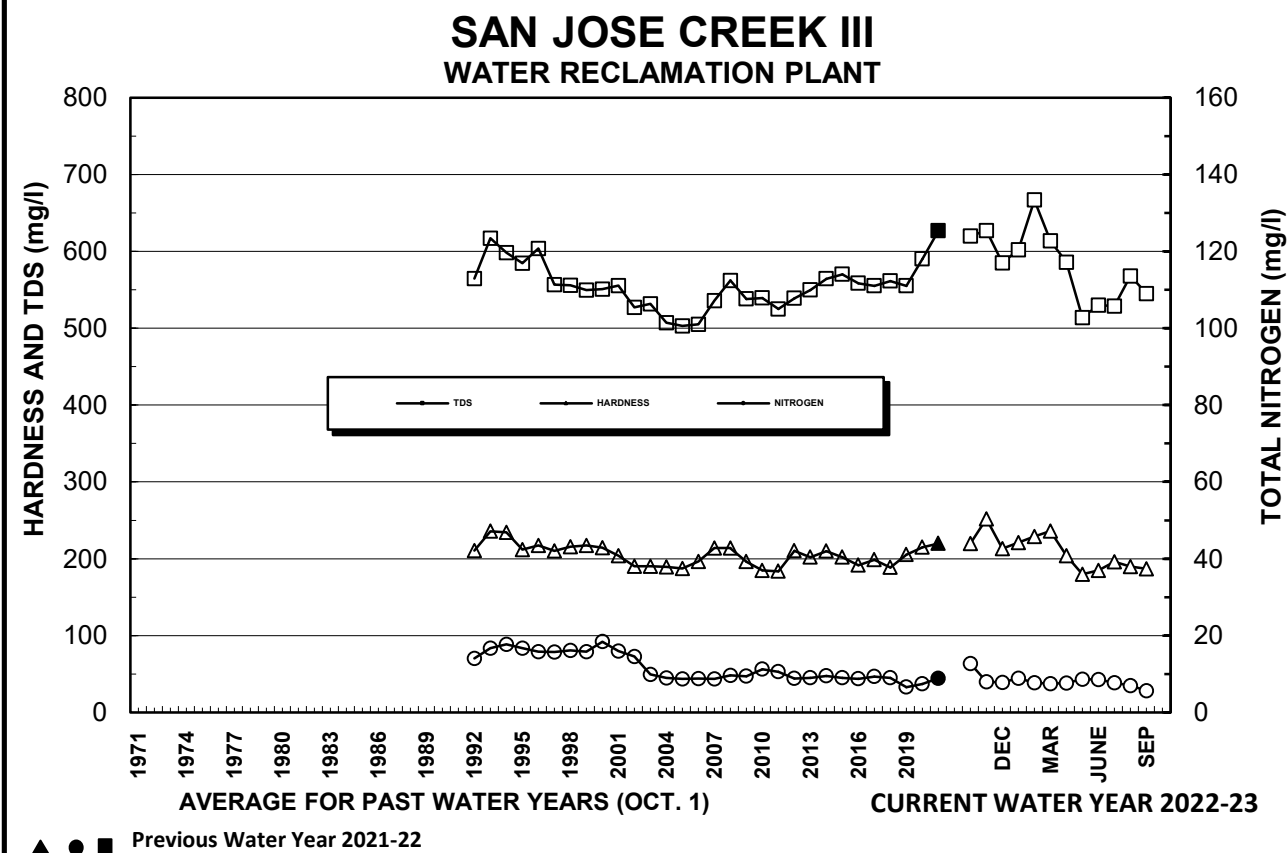
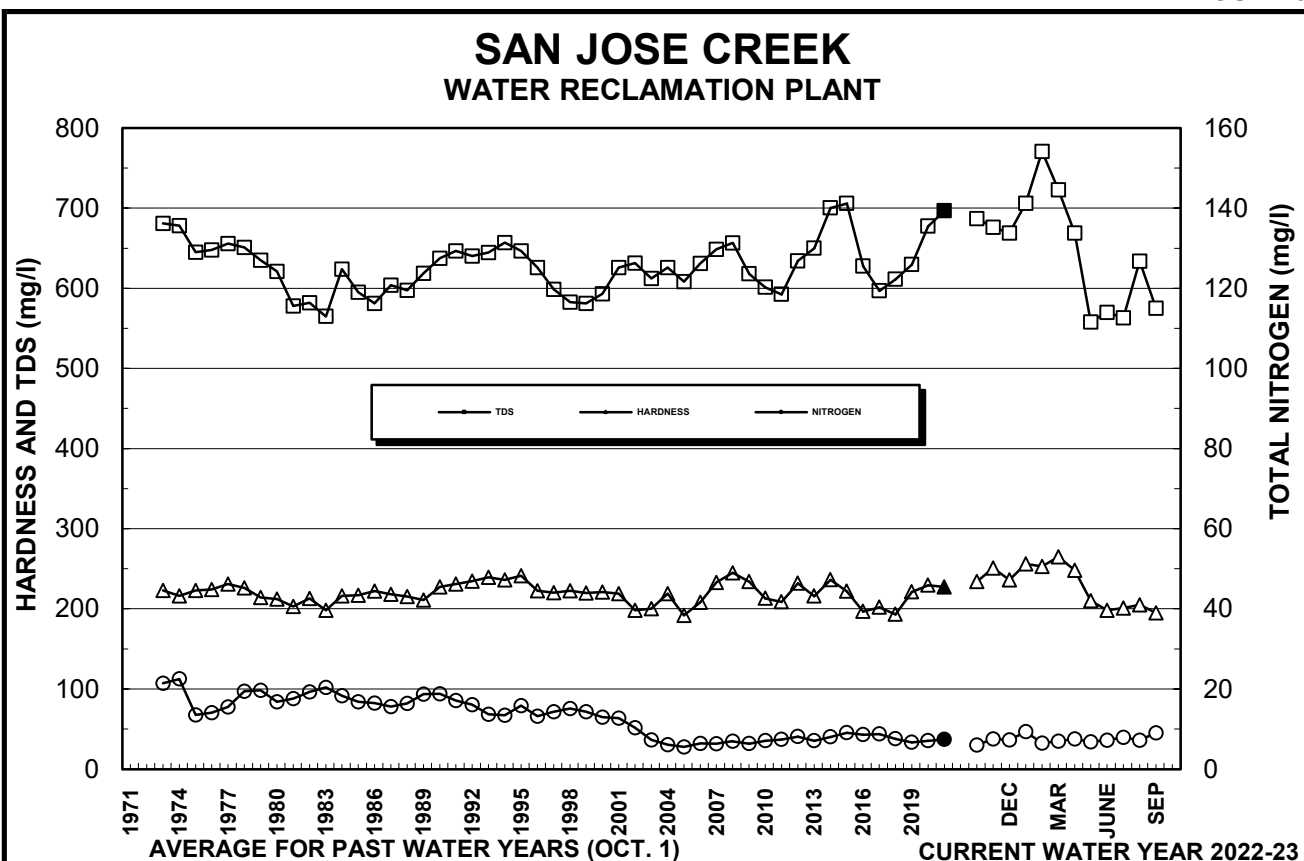
STATE WATER PROJECT EAST BRANCH - SILVERWOOD LAKE



▲ ● ■ Previous Water Year 2021-22

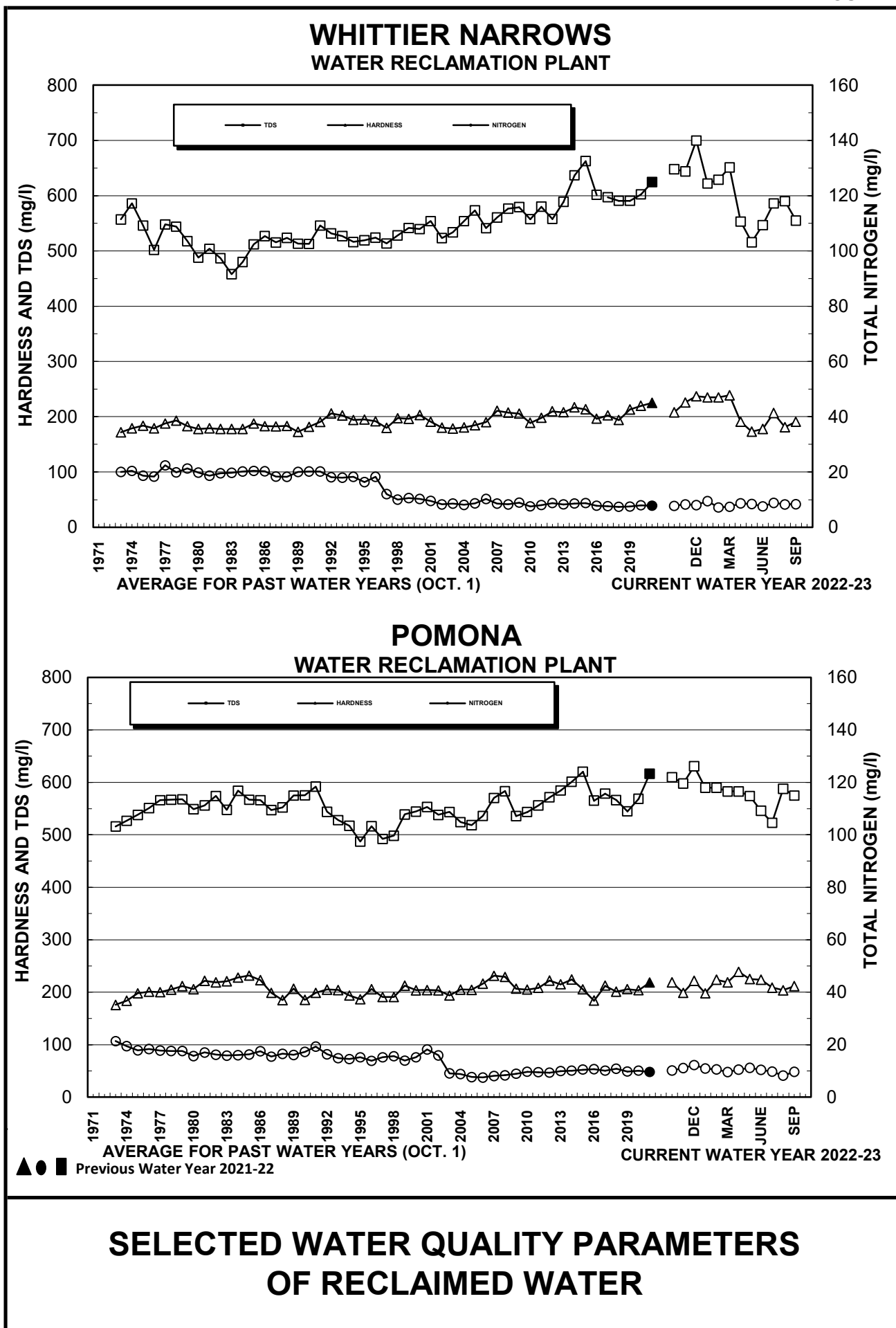
SELECTED WATER QUALITY PARAMETERS OF IMPORTED WATER

FIGURE 3



SELECTED WATER QUALITY PARAMETERS OF RECLAIMED WATER

FIGURE 4



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 2022-23

Because of the existence of an Accrued Credit at the end of 2021-22, the Upper Area made no Make-up Water delivery to the Lower Area during the water year 2022-23.

Accrued Credit as of September 30, 2023

The Lower Area Annual Entitlement as heretofore determined for the water year 2022-23 was 75,600 acre-feet. The Usable Water received was 231,895 acre-feet, which resulted in a credit to the Upper Area for the water year of 156,295 acre-feet. The Upper Area had an Accrued Credit as of September 30, 2022 of 240,277 acre-feet. Thus the total Accrued Credit of the Upper Area as of September 30, 2023 is 396,572 acre-feet.

Requirement for Make-up Water Delivery in 2023-24

Because of the existence of an Accrued Credit on September 30, 2023, the Upper Area is under no obligation to deliver Make-up Water to the Lower Area during water year 2023-24.

Summary

Table 8 presents a summary of the findings of the Watermaster for the water year 2022-23.

TABLE 8
SUMMARY OF FINDINGS FOR WATER YEAR 2022-23

	:	Quantities In Acre-Feet
1. Rainfall 2022-23, 37.5inches		
2. Ten-year average rainfall, 15.5 inches		
3. Lower Area Annual Entitlement		75,600
4. Surface flow through Whittier Narrows		290,996
5. Subsurface Flow through Whittier Narrows		35,300
6. Credited export through Whittier Narrows		23,395
7. Total Flow through Whittier Narrows		349,691
8. Lower Area Replenishment Water		0
9. Reclaimed Water		50,216
10. Make-up Water (Surface Flow Delivery)		0
11. Recirculation of Measured Water		0
12. Unusable Surface Flow		67,580
13. Usable Water Received by Lower Area		<u>231,895</u>
14. Credit for Water Year 2022-23		156,295
15. Accrued Credit of Upper Area as of September 30, 2022		240,277
16. Amount of Make-up Water delivered during Water Year 2022-23		
a. Payment for Recycled Water		0
b. Surface Flow Delivery		0
Total		0
17. Adjusted Accrued Credit of Upper Area as of September 30, 2022		240,277
18. Accrued Credit of Upper Area as of September 30, 2023		396,572
19. Required Make-up Water to be delivered during Water Year 2023-24		0

CHAPTER V. LONG-TERM ACCOUNTING

Long-term Accounting is required by paragraph 5(h) of the Judgment. The Third Long-term Accounting Period was for the 15 water years from 1993-94 through 2008-09. The Long-term Accounting Periods are discussed in this Chapter and are shown in Table 9.

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, thereafter, 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. A summary of the annual amount received for each year of each Long-term Accounting is shown in the Appendix to this report.

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. The annual summary for each year of the First Long-term Accounting Period is in the Appendix in Table 12.

TABLE 9

**SUMMARY OF WATER DELIVERED
UNDER LONG BEACH JUDGMENT
Water Years 1963-2023
(values in acre-feet)**

Long-term Accounting Period	Lower Area Entitlement^(a)	Water Received by Lower Area	Accrued Credit or (Debit)
1 (16 Water Years 1963-64 through 1978-79)	1,544,031	1,376,090	(167,941)
2 (15 Water Years 1979-80 through 1993-94)	1,505,718	1,799,097 ^(b)	125,438
Subtotal	3,049,749	3,175,187	125,438
3 (15 Water Years 1993-94 through 2008-09)	1,457,892	1,477,004	19,112
Subtotal	4,507,641	4,652,191	144,550 ^(c)
4 (14 Water Years 2009-10 through 2022-23)	1,014,100	1,266,122	252,022
Total	5,521,741	5,918,313	396,572

(a) Long-term Lower Area Entitlement calculated in accordance with paragraph 5(h) of the Judgment except for the Fourth Long-term which is an accumulation of annual entitlement for the Accounting Period.

(b) Includes 167,941 acre-feet of Make-up Water to reimburse debit from the end of First Long-term Accounting.

(c) Carried over to the Fourth Long-term Accounting Period.

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 annual credit for Recycled 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

As reported in the Thirty-first Annual Report, the Second Long-term Accounting under the Judgment occurred as of September 30, 1994 for the period of 15 water years 1979-80 through 1993-94. The rainfall for the period averaged 18.89 inches resulting in a total entitlement of 1,505,718 acre-feet for the 15-year period. The amount of Usable Water and Make-up Water received was 1,631,156 acre-feet resulting in a Long-term Accounting Credit of 125,438 acre-feet to be carried over to the Third Long-term Accounting Period. An annual summary for the Second Long-term Accounting Period is in the Appendix in Table 13.

Make-up Water Deliveries

A Long-term Accounting Credit of 125,438 acre-feet existed at the end of the Second Long-term Accounting Period. Therefore, no Make-up Water delivery for the Second Long-term Accounting was required.

Third Long-term Accounting Period

As reported in the Forty-sixth Annual Report, the Third Long-term Accounting under the Judgment occurred as of September 30, 2009 for the period of 15 water years 1994-95 through 2008-09. The rainfall for the period averaged 18.29 inches resulting in a total

entitlement of 1,457,892 acre-feet for the 15-year period. The amount of Usable Water and Make-up Water received was 1,477,004 acre-feet resulting in a credit for the period of 19,112 acre-feet. This credit was added to the accumulated carryover from the Second Long-term Accounting Period resulting in a Long-term Accounting Credit of 144,550 acre-feet to be carried over to the Fourth Long-term Accounting Period. An annual summary for the Third Long-term Accounting Period is in the Appendix in Table 14.

Make-up Water Deliveries

A Long-term Accounting Credit of 144,550 acre-feet existed at the end of the Third Long-term Accounting Period. Therefore, no Make-up Water delivery for the Third Long-term Accounting was required.

Fourth Long-term Accounting Period

Table 10 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 Fourth Long-term Accounting Period beginning with water year 2009-10. Included in the Accrued Credit of the Upper Area at the start of the period is the carryover from the Third Long-term Accounting Period of 144,550 acre-feet.

Water year 2022-23 is the fourteenth year in the Fourth Long-term Accounting Period which, as explained above, occurs between the 15th and 25th year. Table 11 is a summary of operations under the Judgment showing data to be used for the Fourth Long-term Accounting.

TABLE 10
SUMMARY OF ANNUAL OPERATIONS
UNDER JUDGMENT DURING
FOURTH LONG-TERM ACCOUNTING PERIOD

(In Acre-Feet)								
Water Year	Rainfall in Inches		Entitlement	Water Received by Lower Area			Annual Credit (+) or Debit (-)	Accrued Credit (+) or Debit (-)
	Amount	10-year Average		Usable	Make- Up ^(a)	Total		
2008-09			---					+144,550 ^(a)
2009-10	20.2	17.2	88,700	84,054	0	84,054	-4,646	+139,904
2010-11	24.9	18.1	95,300	148,085	0	148,085	+52,785	+192,689
2011-12	10.9	18.6	98,800	77,227	0	77,227	-21,573	+171,116
2012-13	8.0	17.4	90,200	57,187	0	57,187	-33,013	+138,103
2013-14	6.3	16.8	85,600	56,830	0	56,830	-28,770	+109,333
2014-15	11.4	13.4	59,600	69,448	0	69,448	+9,848	+119,181
2015-16	10.1	12.7	54,300	56,484	0	56,484	+2,184	+121,365
2016-17	21.4	14.4	67,200	96,638	0	96,638	+29,438	+150,803
2017-18	7.0	13.4	59,600	44,853	0	44,853	-14,747	+136,056
2018-19	24.6	14.5	68,000	124,546	0	124,546	+56,546	+192,602
2019-20	17.8	14.2	65,700	93,166	0	93,166	+27,466	+220,068
2020-21	6.3	12.4	52,000	49,618	0	49,618	-2,382	+217,686
2021-22	12.6	12.6	53,500	76,091	0	76,091	+22,591	+240,277
2022-23	37.5	15.5	75,600	<u>231,895</u>	0	<u>231,895</u>	+156,295	+396,572
Totals			1,014,100	1,266,122	0	1,266,122		+396,572

(a) Carryover of credit from Third Long-term Accounting Period.

TABLE 11
DATA FOR FOURTH
LONG-TERM ACCOUNTING PERIOD

Number of Years	Water Year	<u>Rainfall in Inches</u>		<u>Water Received by Lower Area in Acre-Feet</u>				Long-Term Accounting Formula ^(b) in Acre-Feet
		Amount	Accumulated Average Annual Amount	Usable	Make-Up	Total	Accumulated Total	
0	2008-09	---	---	---	---		144,550 ^(a)	-----
1	2009-10	20.23	20.23	84,054	0	84,054	228,604	107,502
2	2010-11	24.85	22.54	148,085	0	148,085	376,689	239,554
3	2011-12	10.91	18.66	77,227	0	77,227	453,916	297,477
4	2012-13	7.96	15.99	57,187	0	57,187	511,103	339,882
5	2013-14	6.30	14.05	56,830	0	56,830	567,933	373,307
6	2014-15	11.44	13.62	69,448	0	69,448	637,381	434,259
7	2015-16	10.05	13.11	56,484	0	56,484	693,865	487,664
8	2016-17	21.44	14.15	96,638	0	96,638	790,503	601,543
9	2017-18	6.99	13.35	44,853	0	44,853	835,356	638,475
10	2018-19	24.63	14.48	124,546	0	124,546	959,902	769,465
11	2019-20	17.78	14.78	93,166	0	93,166	1,053,068	863,948
12	2020-21	6.33	14.08	49,618	0	49,618	1,102,686	897,850
13	2021-22	12.64	13.97	76,091	0	76,091	1,178,777	965,073
14	2022-23	37.54	15.65	<u>231,895</u>	0	<u>231,895</u>	1,410,672	1,164,294

(a) Carryover of credit from Third Long-term Accounting Period.

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

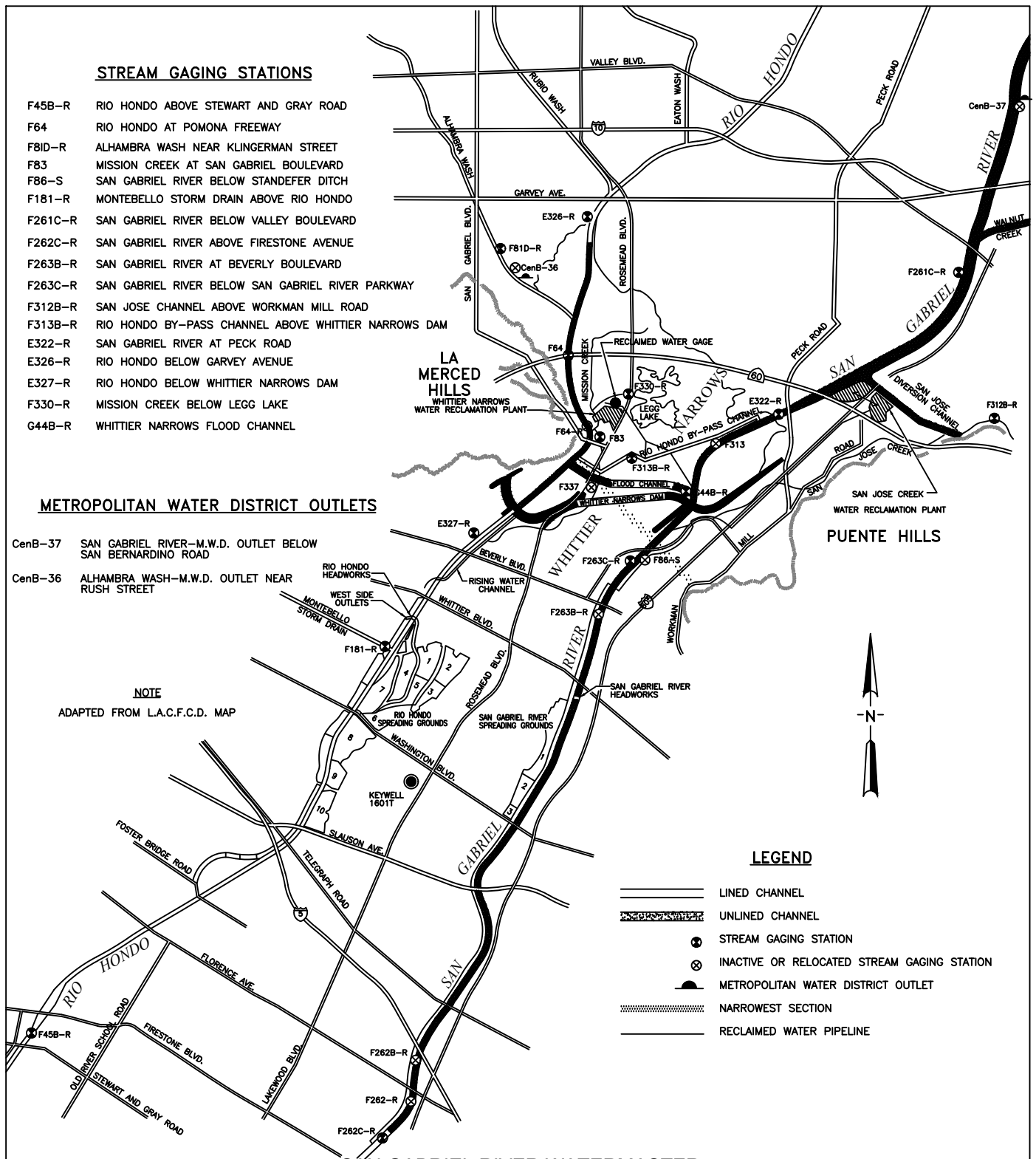
STREAM GAGING STATIONS

F45B-R	RIO HONDO ABOVE STEWART AND GRAY ROAD
F64	RIO HONDO AT POMONA FREEWAY
F81D-R	ALHAMBRA WASH NEAR KLINGERMANN STREET
F83	MISSION CREEK AT SAN GABRIEL BOULEVARD
F86-S	SAN GABRIEL RIVER BELOW STANDEFER DITCH
F181-R	MONTEBELLO STORM DRAIN ABOVE RIO HONDO
F261C-R	SAN GABRIEL RIVER BELOW VALLEY BOULEVARD
F262C-R	SAN GABRIEL RIVER ABOVE FIRESTONE AVENUE
F263B-R	SAN GABRIEL RIVER AT BEVERLY BOULEVARD
F263C-R	SAN GABRIEL RIVER BELOW SAN GABRIEL RIVER PARKWAY
F312B-R	SAN JOSE CHANNEL ABOVE WORKMAN MILL ROAD
F313B-R	RIO HONDO BY-PASS CHANNEL ABOVE WHITTIER NARROWS DAM
E322-R	SAN GABRIEL RIVER AT PECK ROAD
E326-R	RIO HONDO BELOW GARVEY AVENUE
E327-R	RIO HONDO BELOW WHITTIER NARROWS DAM
F330-R	MISSION CREEK BELOW LEGG LAKE
G44B-R	WHITTIER NARROWS FLOOD CHANNEL

METROPOLITAN WATER DISTRICT OUTLETS

CenB-37	SAN GABRIEL RIVER-M.W.D. OUTLET BELOW SAN BERNARDINO ROAD
CenB-36	ALHAMBRA WASH-M.W.D. OUTLET NEAR RUSH STREET

NOTE
ADAPTED FROM L.A.C.F.C.D. MAP

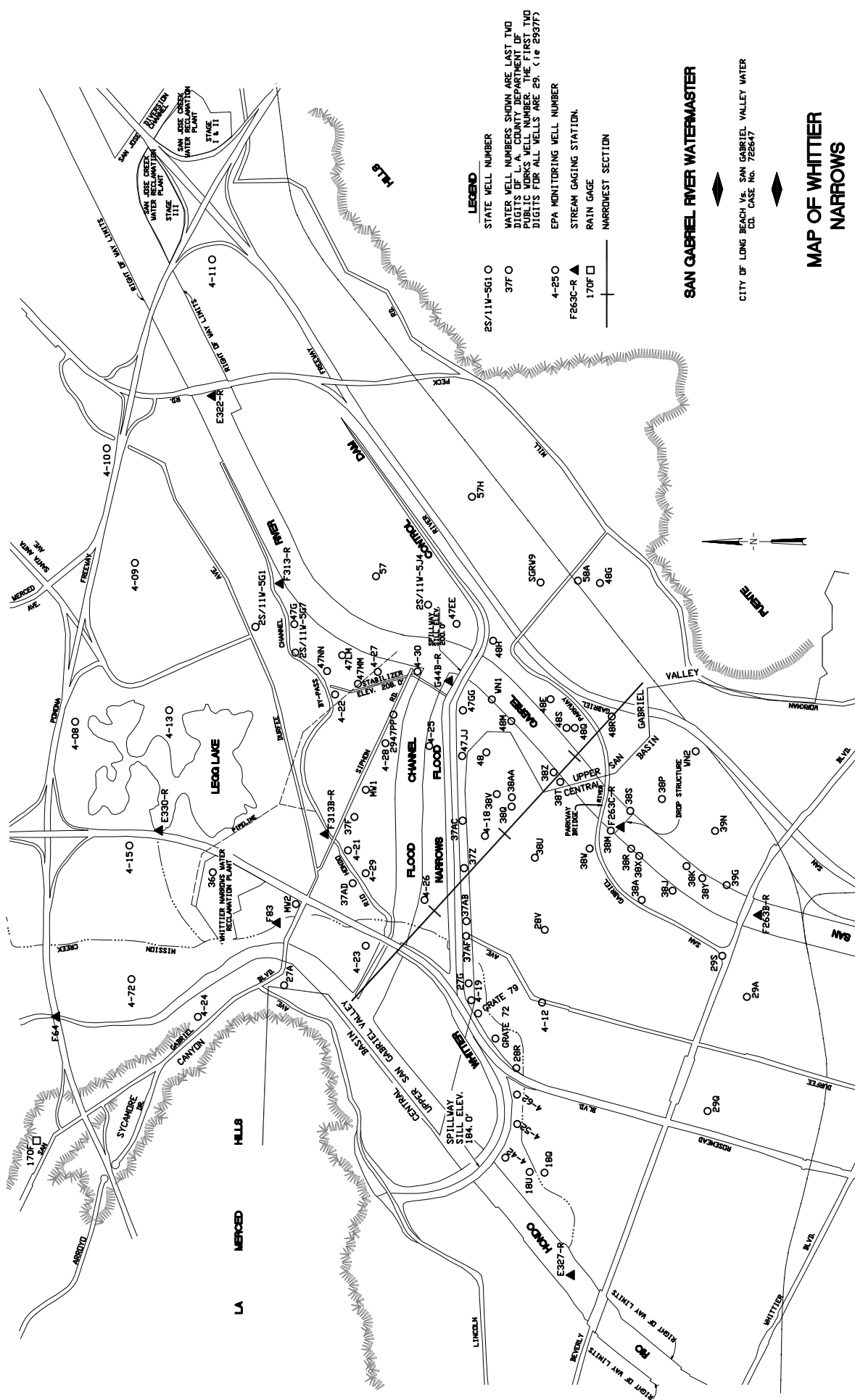


SAN GABRIEL RIVER WATERMASTER

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

STREAM GAGING STATIONS RIO HONDO-SAN GABRIEL RIVER SYSTEM

WATERMASTERS
ROBERT P. GHIRELLI-STEPHEN B. JOHNSON-RICHARD A. RHONE



WATERMASTERS
ROBERT P. GHIRELLI - STEPHEN B. JOHNSON - RICHARD A. RHONE

SCALE OF FEET

2400
1800
1200
600
0

REVISÉ 2/22

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. (sold to California-American Water Company)
Glendora Irrigating Company (now City of Glendora)
Golden State Water Company (formerly known as 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
Water Replenishment District of Southern California

EGAN & EGAN
CERTIFIED PUBLIC ACCOUNTANTS
1545 N. Columbus Ave.
Glendale, CA 91202
EGANCPA.COM 877EGAN4US

Independent Accountant's Report

The San Gabriel River Watermaster

We have performed the procedures enumerated below on the Statement of Income and Expenditures prepared by San Gabriel River Watermaster ("SGRWM") staff. SGRWM staff is responsible for the bank account.

SGRWM has agreed to and acknowledged that the procedures performed are appropriate to meet the intended purpose of determining Statement of Income and Expenditures is accurate. This report may not be suitable for any other purpose. The procedures performed may not meet the needs of all users of this report and, as such, users are responsible for determining whether the procedures performed are appropriate for their purposes.

The procedures and associated findings are as follows:

I. Data, Information and Documents Provided

Stetson Engineers provided the following data, information, and documents:

- a. Bank Statement activity for the period October 1, 2022 through September 30, 2023
- b. Report of Expenditures Breakdown for the period October 1, 2022 through September 30, 2023
- c. Account activity for the Checking and Savings account for the period October 1, 2022 through September 30, 2023

The data, information, and documents listed above and provided by SGRWM staff are collectively referred to as the "Data, Information, and Documents."

II. Procedures Performed

We performed the following agreed-upon procedures on the data, information, and documents. In the event that a document was not clear, data was missing, or there was a question about the information contained in the document relevant to the performance of the agreed-upon procedures, we contacted SGRWM staff.

- a. We determined that the Account activity for the Checking and Savings account appear on the bank statement activity.
- b. We traced the bank balance on the bank activity to the balance on each bank account activity as of September 30, 2023.
- c. We determined the expenditures on the bank activity detail appear in a category on the expenditures breakdown report prepared by SGRWM staff.
- d. Prepared the bank activity schedule as detailed in Exhibit A

III. Summary of Findings

The procedures performed in Section II indicate the procedures and activities performed by SGRWM staff personnel produce reasonable and accurate balances for the cash accounts of SGRWM.

We were engaged by the SGRWM to perform this agreed-upon procedures engagement and conducted our engagement in accordance with attestation standards established by the AICPA. We were not engaged to and did not conduct an examination or review engagement, the objective of which would be the expression of an opinion or conclusion, respectively, on SGRWM's financial statements as a whole. Accordingly, we do not express such an opinion or conclusion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

We are required to be independent of the SGRWM and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements related to our agreed-upon procedures engagement.

Egan & Egan

January 18, 2024

EXHIBIT A

SCHEDULE OF BANK ACTIVITY FOR CHECKING AND SAVINGS ACCOUNTS

		<u>Checking</u>	<u>Savings</u>
Balance as of October 1, 2022		\$ 13,825.51	\$ 290,428.64
Receipts:			
Income		197,000.00	
Interest income			16.89
Transfers in		210,000.00	
Transfer out			(210,000.00)
Less Expenditures:			
Administrative fees and other operating expenses	\$ 19,811.27		
Collection of data, field inspections and maintenance of records	54,294.45		
Calculation and preparation of Watermaster Report for the water year 2021-2022	42,979.72		
Conservancy	5,539.00		
MW Program	65,612.05		
Printing and reproduction costs	6,063.62	194,300.11	
		<u>226,525.40</u>	<u>80,445.53</u>
Balance as of September 30, 2023		\$ <u>226,525.40</u>	\$ <u>80,445.53</u>
Balance on bank statements as of September 30, 2023		\$ <u>233,196.81</u>	\$ <u>80,445.53</u>
Checks for fiscal year ended September 30, 2023 clearing in fiscal year ended September 30, 2024 bank statement, net of checks from fiscal year September 30, 2022 clearing in fiscal year September 30, 2023		<u>(6,671.41)</u>	<u>-</u>
Adjusted balance for fiscal year September 30, 2023		\$ <u><u>226,525.40</u></u>	\$ <u><u>80,445.53</u></u>

TABLE 12
SUMMARY OF ANNUAL FINDINGS FOR
FIRST LONG-TERM ACCOUNTING PERIOD
(acre-feet)

Water Year	Rainfall (inches)		Lower Area Annual Entitlement	Usable Water			Total Flow Through Whittier Narrows	Deduction from Usable Water			Unusable Surface Flow	Usable Water Received	Credit for Water Year	Accrued Credit (Debit)	Annual Make-up Water	
	Annual	Average		Surface Inflow	Subsurface Inflow	Credit for Exported Water		Lower Area Replenishment Water	Reclaimed Water	Make-up Surface Flow					Payment for Reclaimed Water	Surface Flow Delivery
1963-64	9.45	9.45	67,200	112,679	21,000	29,024	162,703	104,842	13,258	0	3,628	40,975	(26,225)	(26,225)		
1964-65	15.24	12.34	68,000	171,597	18,800	30,139	220,536	160,027	14,528	0	11,240	34,741	(33,259)	(59,484)	0	0
1965-66	19.61	14.77	70,300	232,587	17,000	32,506	282,093	121,534	15,056	6,489	67,742	71,272	972	(24,238)	27,785	6,489
1966-67	25.03	17.33	78,700	176,672	17,500	23,395	217,567	84,156	16,224	0	36,534	80,653	1,953	(7,550)	14,735	0
1967-68	15.03	16.87	67,200	151,465	20,700	23,395	195,560	95,165	21,667	0	17,000	61,728	(5,472)	(5,597)	7,425	0
1968-69	30.50	19.14	84,000	637,344	24,400	23,395	685,139	17,748	17,130	0	488,033	162,228	78,228	78,228	5,597	0
1969-70	11.06	17.99	84,000	145,238	23,900	23,395	192,533	68,440	22,252	0	15,080	86,761	2,761	80,989	0	0
1970-71	13.27	17.40	90,200	137,462	22,900	23,395	183,757	71,815	23,754	0	16,266	71,922	(18,278)	62,711	0	0
1971-72	8.53	16.41	79,500	71,510	24,000	23,395	118,905	34,355	21,821	0	8,860	53,869	(25,631)	37,080	0	0
1972-73	22.38	17.01	87,100	174,352	25,900	23,395	223,647	91,614	26,341	0	27,217	78,475	(8,625)	28,455	0	0
1973-74	16.80	16.99	92,500	149,642	26,600	23,395	199,637	91,749	24,811	0	25,708	57,369	(35,131)	(6,676)	0	0
1974-75	14.88	16.82	92,500	112,783	25,600	23,395	161,778	71,359	24,511	0	7,129	58,779	(33,721)	(37,563)	2,834	0
1975-76	12.07	16.45	87,100	86,015	27,800	23,395	137,210	50,530	23,561	0	4,432	58,687	(28,413)	(51,339)	14,637	0
1976-77	14.47	16.31	78,700	73,493	31,700	23,395	128,588	16,239	23,520	14,507	4,206	70,116	(8,584)	(33,022)	12,394	14,507
1977-78	38.37	17.78	96,200	504,355	30,900	23,395	558,650	39,677	20,930	7,864	336,315	153,864	57,664	42,664	10,158	7,864
1978-79	23.87	18.16	--	175,654	27,400	23,395	226,449	65,006	25,696	0	25,521	110,226	--	(167,941)	0	0
Total	290.56		1,544,031	3,112,848	386,100	395,804	3,894,752	1,184,256	335,060	28,860	1,094,911	1,251,665	--	(167,941)	95,565	28,860

TABLE 13
SUMMARY OF ANNUAL FINDINGS FOR
SECOND LONG-TERM ACCOUNTING PERIOD
(acre-feet)

Water Year	Rainfall (Inches)		Lower Area Annual Entitlement	Usable Water			Total Flow Through Whittier Narrows	Deduction from Usable Water			Unusable Surface Flow	Usable Water Received	Credit for Water Year	Accrued Credit (Debit)	Long-term Make-up Water		Annual Make-up Water		
	Annual	Accumulated Average		Surface Inflow	Subsurface Inflow	Credit for Exported Water		Lower Area Replenishment Water	Reclaimed Water	Make-up Surface Flow					Payment for Reclaimed Water	Surface Flow Delivery	Payment	Surface Flow Delivery	Payment for Reclaimed Water
1978-79														(167,941)					
1979-80	34.85	34.85	107,600	493,851	25,300	23,395	542,546	10,196	26,652	10,843	357,680	137,175	29,575	29,575	10,716	0	10,843	0	0
1980-81	10.31	22.58	105,700	133,686	27,400	23,395	184,481	31,665	28,836	31,241	6,822	85,917	(19,783)	9,792	14,568	0	31,241	0	0
1981-82	18.88	21.35	111,900	124,268	29,900	23,395	177,563	4,595	31,151	30,716	16,278	94,823	(17,077)	(7,285)	11,464	0	30,716	0	0
1982-83	39.26	25.83	122,200	383,173	29,100	23,395	435,668	1,896	19,317	8,921	220,520	185,014	62,814	62,814	0	15,883	8,921	7,285	0
1983-84	10.56	22.77	118,600	123,719	28,200	23,395	175,314	1,478	30,068	33,589	10,454	99,725	(18,875)	43,939	0	0	33,589	0	0
1984-85	14.58	21.41	118,100	115,270	28,600	23,395	167,265	40,433	29,009	0	6,858	90,965	(27,135)	16,804	0	0	0	0	0
1985-86	21.96	21.48	123,900	140,444	30,500	23,395	194,339	21,383	26,827	0	26,672	119,457	(4,443)	12,361	0	0	0	0	0
1986-87	9.06	19.93	121,000	105,151	31,900	23,395	160,446	55,375	36,618	0	5,261	63,192	(57,808)	(45,447)	0	0	0	0	0
1987-88	14.88	19.37	106,300	105,413	33,200	23,395	162,008	23,226	39,919	5,712	7,900	85,251	(21,049)	(46,049)	0	0	0	14,735	5,712
1988-89	11.15	18.55	98,800	126,234	33,000	23,395	182,629	49,953	50,907	6,455	5,034	70,280	(28,520)	(53,379)	0	0	0	14,735	6,455
1989-90	12.35	17.95	81,800	138,309	32,100	23,395	193,804	54,011	49,759	13,544	8,781	67,709	(14,091)	(39,191)	0	0	0	14,735	13,544
1990-91	15.12	17.75	85,600	155,247	26,200	23,395	204,842	55,939	53,257	100	19,974	75,572	(10,028)	(34,384)	0	0	0	14,735	100
1991-92	22.86	18.14	88,700	182,796	22,700	23,395	228,891	42,889	45,420	0	34,592	105,990	17,290	(2,359)	0	0	0	14,735	0
1992-93	35.94	19.41	86,400	617,930	21,600	23,395	662,925	16,781	43,442	0	446,108	156,594	70,194	70,194	0	0	0	2,359	0
1993-94	11.64	18.89	--	115,544	24,000	23,395	162,939	20,242	54,134	0	4,201	84,362	--	125,438	0	0	0	0	0
Total	283.34		1,505,718	3,061,035	423,700	350,925	3,835,660	430,062	565,316	141,121	1,177,135	1,522,026	--	125,438	36,748	15,883	115,310	83,319	25,811

TABLE 14
SUMMARY OF ANNUAL FINDINGS FOR
THIRD LONG-TERM ACCOUNTING PERIOD
(acre-feet)

Water Year	Rainfall (inches)		Lower Area Annual Entitlement	Usable Water			Total Flow Through Whittier Narrows	Deduction from Usable Water			Unusable Surface Flow	Usable Water Received	Credit for Water Year	Accrued Credit (Debit)	Annual Make-up Water	
	Annual	Accumulated Average		Surface Inflow	Subsurface Inflow	Credit for Exported Water		Lower Area Replenishment Water	Reclaimed Water	Make-up Surface Flow					Payment for Reclaimed Water	Surface Flow Delivery
1993-94														125,438		
1994-95	30.44	30.44	98,300	283,784	25,300	23,395	332,479	21,710	30,995		139,671	140,103	41,803	167,241	0	0
1995-96	15.60	23.02	94,000	154,569	27,400	23,395	205,364	17,837	52,483	0	26,843	108,201	14,201	181,442	0	0
1996-97	17.49	21.18	99,500	144,423	28,100	23,395	195,918	22,551	48,560	0	17,772	107,035	7,535	188,977	0	0
1997-98	36.13	24.92	113,100	365,127	27,900	23,395	416,422	950	35,946	0	233,804	145,722	32,622	221,599	0	0
1998-99	8.63	21.66	111,300	80,604	27,000	23,395	130,999	0	47,228	0	1,653	82,118	(29,182)	192,417	0	0
1999-00	14.38	20.44	112,500	126,863	27,200	23,395	177,458	44,739	41,556	0	14,121	77,042	(35,458)	156,959	0	0
2000-01	15.50	19.74	112,500	117,972	27,900	23,395	169,267	23,328	44,817	0	15,537	85,585	(26,915)	130,044	0	0
2001-02	6.44	18.08	102,700	115,800	27,400	23,395	166,595	42,699	59,703	0	2,772	61,421	(41,279)	88,765	0	0
2002-03	19.36	18.22	91,500	142,787	24,000	23,395	190,182	22,298	41,761	0	34,031	92,092	592	89,357	0	0
2003-04	12.90	17.69	92,500	95,028	24,200	23,395	142,623	24,508	43,352	0	11,691	63,072	(29,428)	59,929	0	0
2004-05	45.32	20.20	102,700	617,636	21,600	23,395	662,631	24,250	28,475	0	439,536	170,370	67,670	127,599	0	0
2005-06	16.78	19.91	103,300	131,371	24,300	23,395	179,066	32,875	40,502	0	7,571	98,118	(5,182)	122,417	0	0
2006-07	4.94	18.76	94,800	96,291	26,400	23,395	146,086	39,970	43,629	0	369	62,118	(32,682)	89,735	0	0
2007-08	16.37	18.59	80,200	101,211	30,300	23,395	154,906	1,492	37,318	0	17,052	99,044	18,844	108,579	0	0
2008-09	14.00	18.29		68,027	31,300	23,395	122,722	0	36,229	0	1,530	84,963	-	144,550	0	0
Total	274.28		1,457,892	2,641,493	400,300	350,925	3,392,718	319,207	632,554	0	963,953	1,477,004	-	144,550	0	0

TABLE 15
SUMMARY OF ANNUAL FINDINGS FOR
FOURTH LONG-TERM ACCOUNTING PERIOD
(acre-feet)

Water Year	Rainfall (inches)		Lower Area Annual Entitlement	Usable Water			Total Flow Through Whittier Narrows			Deduction from Usable Water			Unusable Surface Flow	Usable Water Received	Credit for Water Year	Accrued Credit (Debit)	Annual Make-up Water	
	Annual	Accumulated Average		Surface Inflow	Subsurface Inflow	Credit for Exported Water				Lower Area Replenishment Water	Reclaimed Water	Make-up Surface Flow					Payment for Reclaimed Water	Surface Flow Delivery
2008-09																144,550		
2009-10	20.23	20.23	88,700	125,653	29,400	23,395	178,448			26,110	52,808	0	15,476	84,054	(4,646)	139,904	0	0
2010-11	24.85	22.54	95,300	215,561	25,400	23,395	264,356			36,960	34,341	0	44,970	148,085	52,785	192,689	0	0
2011-12	10.91	18.66	98,800	87,314	23,700	23,395	134,409			0	52,930	0	4,252	77,227	(21,573)	171,116	0	0
2012-13	7.96	15.99	90,200	62,696	27,200	23,395	113,291			0	55,508	0	596	57,187	(33,013)	138,103	0	0
2013-14	6.30	14.05	85,600	53,981	35,100	23,395	112,476			0	55,646	0	0	56,830	(28,770)	109,333	0	0
2014-15	11.44	13.62	59,600	73,134	35,700	23,395	132,229			18,433	44,348	0	0	69,448	9,848	119,181	0	0
2015-16	10.10	13.11	54,300	86,843	31,200	23,395	141,438			24,121	60,833	0	0	56,484	2,184	121,365	0	0
2016-17	21.44	14.15	67,200	161,754	23,500	23,395	208,649			34,042	58,067	0	19,902	96,638	29,438	150,803	0	0
2017-18	6.99	13.36	59,600	66,066	24,800	23,395	114,261			11,234	56,690	0	1,484	44,853	(14,747)	136,056	0	0
2018-19	24.63	14.49	68,000	147,754	27,400	23,395	198,549			6,173	48,464	0	19,366	124,546	56,546	192,602	0	0
2019-20	17.78	14.78	65,700	98,750	30,700	23,395	152,845			1,100	54,010	0	4,569	93,166	27,466	220,068	0	0
2020-21	6.33	14.08	52,000	55,827	32,700	23,395	111,922			929	61,370	0	5	49,618	(2,382)	217,686	0	0
2021-22	12.64	13.97	53,500	83,411	36,900	23,395	143,706			0	65,683	0	1,932	76,091	22,591	240,277	0	0
2022-23	37.54	15.65	75,600	290,996	35,300	23,395	349,691			0	50,216	0	67,580	231,895	156,295	396,572	0	0
Total	219.14	--	1,014,100	1,609,740	419,000	327,530	2,356,270			159,102	750,914	0	180,132	1,266,122	--	396,572	0	0

