

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

FIFTH ANNUAL REPORT OF

**SAN GABRIEL RIVER
WATERMASTER SERVICE**

1967-68

February 28, 1969

SAN GABRIEL RIVER WATERMASTER

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

WATERMASTERS
MAX BOOKMAN
M. E. SALSBUURY
THOMAS M. STETSON

February 28, 1969

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

Re: Watermaster Report for 1967-68 Water Year

Gentlemen:

We have the honor of submitting the fifth annual report of the San Gabriel River Watermaster, for water year 1967-68, in accordance with the Judgment in Case No. 722647, entered September 24, 1965.

Following two years of above normal rainfall, the water year 1967-68 average rainfall in San Gabriel Valley again dropped below normal to 15.03 inches. The 10-year average annual rainfall (1958-59 through 1967-68) dropped from 15.9 inches for water year 1966-67 to 14.4 inches. This was because the excessive rainfall for the water year 1957-58 (30.2 inches) is no longer included in the 10-year period. The long-term 90-year average rainfall (1872-73 through 1961-62) for San Gabriel Valley is 18.52 inches.

As a result of a decrease in the 10-year average rainfall the Lower Area Annual Entitlement for 1967-68 decreased to 67,200 acre-feet compared to the prior year entitlement of 78,700 acre-feet.

The principal Watermaster findings for the water year 1967-68 are as follow:

	<u>Acre-feet</u>
Lower Area Annual Entitlement	67,200
Usable Water received by Lower Area	61,728
Accrued Debit of Upper Area as of September 30, 1968	5,597
Minimum amount of Makeup Water required to be delivered prior to October 1, 1969	1,866

Clerk of Superior Court of
Los Angeles County and
All Parties

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February 28, 1969

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

We again gratefully acknowledge the cooperation and data furnished by the Los Angeles County Flood Control District and others.

Very truly yours,

SAN GABRIEL RIVER WATERMASTER

By:

Max Bookman
Max Bookman

M. E. Salisbury
M. E. Salisbury

Thomas M. Stetson
Thomas M. Stetson

Encl.

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CHAPTER I. ACTIVITIES OF WATERMASTER

Court action in 1965 resulted in a division of the water supplies of the San Gabriel River on an inter-basin allocation rather than requiring adjudication of the rights of the various water producers in the affected areas. Thus, a new approach was established for solution of water rights controversies involving parties within a stream system containing more than one ground water basin. Through this action the upstream and downstream users of the San Gabriel River System, which supplies water for nearly 4,000,000 people, avoided extended, costly and bitter litigation and provided the means for accomplishing ground water management best suited to each area.

The runoff of the San Gabriel River System, after discharging from the San Gabriel Mountains, flows across the large ground water basin of the main San Gabriel Valley. Joined by runoff from rainfall on the valley floor, it passes through the Whittier Narrows and crosses the ground water basin of the Coastal Plain of Los Angeles County. Recharge of the important ground water supplies is thus provided to both the San Gabriel Valley and the Coastal Plain.

The Judgment in the case of City of Long Beach, et al., vs. San Gabriel Valley Water Co., et al., hereinafter referred to as the Long Beach Case, divided the water supply available to these two ground water basins by establishing the entitlement to Usable Water that the Lower Area

should receive annually through Whittier Narrows. As a result both the upper and lower ground water basins can and have initiated independent plans for management and protection of the ground water supplies within their respective basins. This accomplishment is unique in the history of water rights in the State of California.

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 detail the channels and facilities in the Whittier Narrows area.

The Judgment in the Long Beach Case provides for the establishment of a Watermaster and submission to the Court and All Parties of an annual report. Again presented in this fifth annual report is a brief history of the litigation and a summary of the activities of the Watermaster. Also included is a determination of the Lower Area Annual Entitlement, Usable Water, Accrued Debit and the Makeup Water required to be delivered by the Upper Area.

History of Litigation

On May 12, 1959, a complaint was filed in the Superior Court in and for the County of Los Angeles, Case No. 722647, by the City of Long Beach, the Central Basin Municipal Water District, and the City of Compton. The defendants were 24 of the major producers of water

in the Main San Gabriel Basin and the Upper San Gabriel Valley Municipal Water District. The purpose of the suit was to determine the rights of the parties to waters of the San Gabriel River System and to provide for protection against interference with the rights of the Lower Area Parties.

In an effort to reach a physical solution, two negotiating committees of five members each were appointed, one to represent the plaintiffs and one to represent the defendants. Attorneys, engineers and geologists were utilized as advisors to the negotiating committees and on September 26, 1961, a statement of "Principles for Settlement" was executed. There followed a period of study and negotiations in order to arrive at a fair and equitable physical solution to the problem.

On August 24, 1964, the Upper San Gabriel Valley Municipal Water District intervened in the action to assume the responsibilities of the Upper Area under the terms of the Judgment. In order to reimburse the District for its expenses in so doing, a Reimbursement Contract was entered into by the District and all of the defendants and certain other producers of water from the Upper Area.

A proposed Stipulation for Judgment and Judgment were approved by the joint negotiating committees on December 7, 1964, and thereafter were approved by all parties. On September 24, 1965, Judgment was entered by Judge Edmund Moor.

The Judgment provided that the Lower Area Average Annual Entitlement would be a usable supply of 98,415 acre-feet. However, due to fluctuations in rainfall, the Lower Area Annual Entitlement in any particular year varies from the average in accordance with rainfall received in San Gabriel Valley during the ten preceding years. The components of usable supply are Surface Flow, Subsurface Flow and Export to Lower Area. Deficiencies in the Lower Area Annual Entitlement are to be satisfied by the Upper District as Makeup Water. The effective date of the Judgment was October 1, 1963.

The Judgment provided for the appointment of a three-man 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-man Watermaster was appointed and certified by the Court. The Upper Area is represented by Thomas M. Stetson, the Lower Area by Max Bookman, and both areas by M. E. Salsbury.

The Watermaster issued his report for the first and second years, 1963-64 and 1964-65, on February 28, 1966. The third annual report of the Watermaster for year 1965-66 was issued on February 28, 1967. The fourth annual report on Watermaster service for the year preceding this report, 1966-67, was issued on February 29, 1968.

Watermaster Operations

The activities of the Watermaster include administration of operations under the Judgment; performance of field inspections, collection of data and maintenance of records; analysis of data and preparation of the annual report; and the maintenance of records on the transfer of water rights. All operations and reports are based on the "water year," which is from October 1 to September 30.

The Judgment requires that the Watermaster make the following determinations each year:

1. The number of inches of depth of average rainfall on San Gabriel Valley.
2. The average annual rainfall on San Gabriel Valley for the ten consecutive water years ending with the year of calculation.
3. The Lower Area Annual Entitlement and the entitlement for the Long-term Accounting Period.
4. The amount of Surface Flow through Whittier Narrows.
5. The amount of Subsurface Flow.
6. The amount of Export to Lower Area.
7. The amount of Lower Area Replenishment Water.
8. The amount and quality of Reclaimed Water reclaimed by or on behalf of Lower Area.

9. The total amount of Makeup Water delivered to Lower Area.
10. The surface outflow from Montebello Forebay in the channel of each of the Rio Hondo and San Gabriel River.
11. The amount of Usable Water received by the Lower Area.
12. The Accrued Debit of Upper Area, if any, or Accrued Credit of Upper Area, if any, as it exists at the end of each water year.
13. The amount, if any, of Makeup Water which Upper District is obligated to deliver during the following water year.

Administration

The official office and depository of records of the Watermaster is at 102 North Brand Boulevard, Glendale, California, and such records are available for inspection at the request of any party.

A tentative budget for the water year 1968-69 was transmitted to the parties on July 30, 1968. After fifteen days, there being no objections thereto, the tentative budget became the final budget and is set forth in Table 1.

An audit of expenditures of the Watermaster for the preceding water year was obtained. This audit was performed by R. J. Galletly, CPA, and a letter from the auditor dated November 11, 1968, presenting his findings and showing the income and expense, is included in the appendix.

TABLE 1
WATERMASTER BUDGET
for the
WATER YEAR 1968-69

1.	Administrative fees of Watermaster and general operating expenses	\$ 2,000
2.	Field inspections	1,100
3.	Collection of data and maintenance of records	3,500
4.	Calculations and preparation of Watermaster Report for Water Year 1967-68	3,000
5.	Printing and reproduction costs	600
6.	Measurement installations-vicinity of Whittier Narrows	3,800
7.	Contingencies	<u>500</u>
	TOTAL	\$14,500
	Less estimated carry-over from 1967-68	<u>- 7,000</u>
	Balance to be financed for 1968-69	\$ 7,500

Proration for Payment Purposes

Upper San Gabriel Valley Municipal Water District	50%	\$ 3,750.00
Central Basin Municipal Water District	41.2%	3,090.00
City of Long Beach	7.125%	534.37
City of Compton	1.675%	<u>125.63</u>
TOTAL		\$ 7,500.00

Data Collection

The Watermaster collects data on stream flow, rainfall, water quality, ground water levels, export of water, reclaimed water, replenishment water, and other information as required. The principal source of data is the Los Angeles County Flood Control District. Copies of records were obtained from the District, and many conferences were held between Flood Control District personnel and Watermaster personnel in order that the Watermaster would be fully informed on the facts necessary to the determinations required by the Judgment. Other data were obtained from the Metropolitan Water District, the County Sanitation Districts, the Central and West Basin Water Replenishment District, the Upper San Gabriel Valley Municipal Water District, the U.S. Geological Survey and the U.S. Army Corps of Engineers. Additional data on water quality were obtained from the cities of Glendora and Monrovia, the Azusa Valley Water Company, California-American Water Company, San Gabriel Valley Water Company, and the State Department of Water Resources.

Field Inspection

A number of field inspections were made of stream gaging facilities in the Whittier Narrows area. On August 14, 1968, the Watermaster, accompanied by representatives of the Los Angeles County Flood Control District conducted a detailed inspection of all stream gaging stations in the Whittier Narrows area.

During the first part of the 1967-68 water year, two separate construction activities influenced the flow of water in the Whittier Narrows and Montebello Forebay. Periodic inspection trips were made to determine the effect of the construction on the flow of water. One of these activities included the construction of a plastic lining in Legg Lake by the County of Los Angeles. Due to high ground water conditions, a large volume of water was pumped from the construction area. The discharge of this water is discussed in Chapter III. The other major construction activity was reconstruction of the San Gabriel River between Whittier Narrows Dam and a point south of Florence Avenue by the U.S. Corps of Engineers. The effect of this construction on the determination of Usable Water will also be discussed in Chapter III. Both of these activities were concluded during the water year.

Preparation of Annual Report

One of the required functions of the Watermaster is the preparation of the annual report. The Judgment provides that a report be prepared and submitted within five months after the end of each water year. This report covers the fifth year of operation under the Judgment--the water year 1967-68.

Delivery of Makeup Water

The Upper District was required during the 1967-68 water year to deliver to Lower Area a minimum of 2,475 acre-feet of Makeup water of an accrued debit of 7,425 acre-feet. The Upper District elected to

reimburse Central Municipal by payment in the amount of \$119,171.25, for 7,425 acre-feet of reclaimed water at an average price of \$16.05 per acre-foot. This payment was made on September 25, 1968.

Stream Gaging Stations

The Watermaster maintained contact with the Los Angeles County Flood Control District and the U.S. Geological Survey regarding operation of stream gaging stations in the vicinity of Whittier Narrows.

Prior Watermaster reports have expressed concern of the adequacy of gaging at the Whittier Narrows Flood Channel Station E337-R. This gage is subject to unusual conditions. With storage of water in Whittier Narrows Reservoir, the gage can be affected by back-water. A training dike exists in the near vicinity of the gage and debris buildup can become significant. For these reasons the Watermaster has developed an alternative method for determining the flow in the crossover channel which may be used during such times as measurements appear questionable at Station E337-R. This method determines Usable Water on the Rio Hondo by adding the amount spread in Rio Hondo Spreading Grounds to the estimated amount of water infiltrated in the Whittier Narrows Reservoir.

Prior reports of the Watermaster indicated that the findings for water year 1965-66 would be reviewed. The alternative method noted above was applied and the Watermaster concluded that there was insufficient substantiation of error, in this instance, to warrant any change in the prior findings.

The location of gaging stations on the San Gabriel River below Whittier Narrows Reservoir were changed during the 1967-68 water year. A station at Parkway Bridge, as anticipated in the Judgment, was constructed by the U.S. Corps of Engineers as part of the flood control improvements of the channel. This station became operative in August 1968. Prior to August, data for this station were developed by Flood Control District personnel, based on periodic discharge measurements. The station at Beverly Boulevard is being continued by the County Flood Control District for the purpose of measurement of low flows only. This record will be continued at least one year so that an overlap of data at the new station at Parkway Bridge will be available.

There was no measurement of water at Florence Avenue on the San Gabriel River during the 1967-68 water year, due to the Channel construction by the Corps of Engineers. However, a new gage has been installed at the drop structure upstream from Florence Avenue and is currently operating. It was necessary for the Watermaster to estimate flows at Florence Avenue for the 1967-68 water year, as provided in the Judgment. This is discussed later in the report.

Transfer of Water Rights

In event of a change in ownership of the water rights of any of the Defendants in the case, the Judgment requires that the Watermaster shall be notified of such transfer in writing.

The Watermaster has not been advised of any transfers during the 1967-68 water year. Two previous transfers of water rights were reported in prior reports. These are the transfer of the Glendora Irrigating Company to the City of Glendora on April 28, 1965 and of the California Water and Telephone Company to the California-American Water Company in March 1966.

The water rights in the San Gabriel Valley are currently being adjudicated and the Watermaster has been kept informed regarding these activities.

CHAPTER II. LOWER AREA ANNUAL ENTITLEMENT

The Lower Area Annual Entitlement for the water year 1967-68 is based on the average annual rainfall which occurred in the 10-year period ending with water year 1967-68 and the corresponding entitlement shown in Table A of the Judgment. Four precipitation stations in the San Gabriel Valley are utilized to determine the average annual precipitation for San Gabriel Valley. The four stations are located at San Dimas, Walnut, El Monte and Pasadena.

Precipitation during the 1967-68 water year at the four locations was as follows:

<u>Station number</u>	<u>Location</u>	<u>Depth of precipitation, in inches</u>
95	114 East First Street, San Dimas	14.93
102C	19711 East Valley Blvd., Walnut	14.64
108D	119 South Hoyt Avenue, El Monte	14.48
610B	City Hall, Pasadena	<u>16.07</u>
	Average rainfall	15.03

Shown following is the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 1958-59 through 1967-68.

TABLE 2
AVERAGE ANNUAL RAINFALL
IN SAN GABRIEL VALLEY
1958-59 through 1967-68

<u>Water year</u>	<u>Rainfall, in inches</u>
1958-59	8.5
1959-60	10.6
1960-61	5.9
1961-62	22.4
1962-63	12.3
1963-64	9.4
1964-65	15.2
1965-66	19.6
1966-67	25.0
1967-68	<u>15.0</u>
Total	143.9
10-year average	14.4

Based on the 10-year average rainfall of 14.4 inches, the Lower Area Annual Entitlement for the water year 1967-68 is 67,200 acre-feet, determined from Table A of the Judgment.

CHAPTER III. USABLE WATER

Presented in this chapter is the determination of the quantity of Usable Water received by the Lower Area during the water year 1967-68.

Surface Flow

The items to be included in Surface Flow through Whittier Narrows are described in Part III.A of Exhibit B of the Judgment. The Surface Flow is, for the most part, based upon stream flow measurements made by the Los Angeles County Flood Control District. Insofar as can be determined, the stream gage recorders were all operating normally during 1967-68, with the exception of Station E337-R and the gages on the San Gabriel River which were affected by construction work.

Rio Hondo above Mission Bridge, Station F64-R

The measured flow at Station F64-R for the water year 1967-68 was 85,660 acre-feet.

Mission Creek at San Gabriel Boulevard, Station F83-R

The measured flow at Station F83-R for the water year 1967-68 was 3,340 acre-feet.

Rio Hondo Bypass Channel, Station F313-R

No water flowed through the channel at this gage during the water year 1967-68.

Whittier Narrows Flood Channel, Station E337-R

The U.S. Geological Survey, which operated Station E337-R, reported a flow of 15,850 acre-feet for the water year 1967-68. However, the Watermaster noted that the record of March 7, 8 and 9, 1968, is an instance in which the alternative method described heretofore may apply. Further investigation will be made and the results reported in a subsequent Watermaster report.

During the 1967-68 water year there was construction work on the San Gabriel River and at Legg Lake. These activities resulted in additional components of flow in the vicinity of the Whittier Narrows Flood Channel. These items are discussed later under the heading "Other Inflows."

Sycamore Canyon

The runoff from Sycamore Canyon which flows through Whittier Narrows is based on precipitation at Potrero Heights (Station 170D). Sycamore Canyon is located in the Merced Hills westerly of the Whittier Narrows and enters the Rio Hondo below Station F64-R, Rio Hondo above Mission Bridge. During the water year 1967-68, the precipitation at that station was 12.77 inches. Referring to Table 6 of Exhibit B, the runoff from Sycamore Canyon was determined to be 75 acre-feet.

San Gabriel River near Parkway Bridge

In August 1968 a new gage called San Gabriel River at Parkway Bridge, F263C-R, was installed. The installation of the gage was

anticipated in the Judgment. This gage takes the place of the prior measurement of discharge at Beverly Boulevard on the San Gabriel River. The prior method involved the calculation of the amount of water which percolated in the San Gabriel River between the point of maximum rising water and the Beverly Boulevard gage.

Prior to the time when the gage was fully activated, the flow at Parkway Bridge was determined by the Los Angeles County Flood Control District hydrographer, who made discharge measurements at Parkway Bridge at regular intervals. The gates on the San Gabriel River at Whittier Narrows Dam were kept closed during the entire storm season which limited the discharge downstream past the Parkway Bridge. These gates are not equipped with seals so that some leakage occurs. The Flood Control District has developed a rating curve of reservoir elevation and the amount of leakage through the gates. Utilizing this rating curve it was possible to develop flows at the Parkway Gage during period of storms with a fairly high degree of accuracy.

The flow determined by the Flood Control District at the San Gabriel River at Parkway Bridge, the point of maximum rising water, for the 1967-68 water year was 29,620 acre-feet.

Reclaimed Water Delivered to Rio Hondo

Water from the Whittier Narrows Water Reclamation Plant is delivered to either the San Gabriel River or Rio Hondo. Of the total production of 18,402 acre-feet of Reclaimed Water during the 1967-68

water year, 16,427 acre-feet was delivered to the Rio Hondo, and of the latter amount, 46 acre-feet was included with the storm flow measured at Station E337-R. Thus, 16,381 acre-feet was delivered to the river below the F64-R gage and must therefore be added as Surface Flow. Reclaimed Water in the amount of 1,975 acre-feet was delivered to the San Gabriel River above the gaging station and is included in the measurement at Parkway Bridge. Reclaimed Water lost to the ocean during storm operations is not paid for by the Central and West Basin Water Replenishment District. The losses during the year were 127 acre-feet, resulting in a purchase of Reclaimed Water of 18,275 acre-feet.

Other Inflow

During the 1967-68 water year, ungaged surface water entered the Coastal Plain in the vicinity of Rosemead Boulevard and the Whittier Narrows Flood Channel due principally to construction work in the vicinity of the Whittier Narrows.

Work continued during 1967-68 on lining Legg Lake. The lake was drained in order that an impermeable bottom could be installed. As in the previous water year, it was necessary for the contractor to pump to lower the ground water table during construction. A large amount of this water was pumped into Mission Creek and was measured at Station F83-R. Other water was pumped into adjacent fields and allowed to infiltrate. During October 1967 the contractor pumped water into the Rio Hondo By-Pass Channel in which reclaimed water was flowing. The

amount of water from Legg Lake which was diverted by the contractor to the channel during 1967-68 was determined by the hydrographer of the Flood Control District to be 280 acre-feet. This water entered the Lower Area.

The contractor on the Corps of Engineers' project on the San Gabriel River installed pumps upstream of Whittier Narrows Dam and diverted some of the San Gabriel River water to the Rio Hondo via the Flood Channel. Frequent measurements of these operations were continued by the hydrographer of the Flood Control District during 1967-68. These measurements show that during the 1967-68 water year the pumping by the contractor caused 259 acre-feet of water to flow ungaged into the Lower Area.

The total amount of ungaged surface flow for the 1967-68 water year was determined to be 539 acre-feet.

Summary of Surface Flow

A total of 151,465 acre-feet of surface water flowed through Whittier Narrows during the water year 1967-68. Table 3 shows the components and calculations of the Surface Flow.

TABLE 3

SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS
FOR WATER YEAR 1967-68

<u>Point of measurement</u>	<u>Amount in acre-feet</u>
Rio Hondo above Mission Bridge, Station F64-R	85,660
Mission Creek at San Gabriel River, Station F83-R	3,340
Rio Hondo By-pass Channel, Station F313-R	0
Whittier Narrows Flood Channel, Station E337-R	15,850
Sycamore Canyon	75
San Gabriel River at Parkway Bridge, Station 263C-R	29,620
Reclaimed water delivered to Rio Hondo Channel below Station F64-R	16,381
Other inflow	<u>539</u>
Total Surface Flow	151,465

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 levels in Whittier Narrows.

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 those calculations of Subsurface Flow for the water year 1967-68, which amounted to 20,700 acre-feet.

<u>Time</u>	<u>Subsurface flow in acre-feet</u>
Spring 1966	15,800
Fall 1966	13,400
Spring 1967	20,900
Fall 1967	25,200
Spring 1968	25,000
Fall 1968	<u>23,800</u>
Subsurface Flow 1967-68	20,700

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 water year 1967-68 there were three entities which transported water by pipelines through Whittier Narrows. They are the California Domestic Water Company, Suburban Water Systems and the City of Whittier. The total export for each of the exporters in water year 1967-68 as shown by reports filed with the Upper San Gabriel Valley Municipal Water District is shown below.

<u>Exporter</u>	<u>Export to Lower Area in acre-feet</u>
California Domestic Water Company	14,827
Suburban Water Systems	12,679
City of Whittier	<u>8,778</u>
Total	36,284

The Judgment provides that commencing in the water year 1966-67, the maximum allowance for export in the determination of Usable Water shall not exceed 23,395 acre-feet. The quantity credited herein as Export to Lower Area for 1967-68 is therefore 23,395 acre-feet.

Lower Area Replenishment Water

The Lower Area purchases replenishment water from The Metropolitan Water District of Southern California. Deliveries were made during water year 1967-68 from Metropolitan's Middle Feeder at three connections: (1) San Gabriel River north of the San Bernardino Freeway (M335-R), (2) Alhambra Wash (M340-R), and (3) the Live Oak Wash turnout (F311-R). All connections are metered and delivered amounts are recorded by the Metropolitan Water District. During water year 1967-68, the amount of imported water purchased for replenishment by or on behalf of the Lower Area Parties was 66,592 acre-feet at Alhambra Wash, 14,827 acre-feet at the San Gabriel River, and 13,971 acre-feet at Live Oak Wash, for a total of 95,390 acre-feet.

Provision is made in the Judgment for the deduction of evaporation losses from the metered releases of replenishment water. The calculated amounts of evaporation were 26 acre-feet for Alhambra Wash releases, 84 acre-feet for San Gabriel River releases, and 115 acre-feet for the Live Oak Wash releases, for a total of 225 acre-feet.

The net amount of Lower Area Replenishment Water, after deducting evaporation amounted to 95,165 acre-feet.

Reclaimed Water

The total amount of reclaimed water produced at the Whittier Narrows Water Reclamation Plant during 1967-68 was 18,402 acre-feet. During storm periods 127 acre-feet of the reclaimed water delivered to the Rio Hondo flowed past the Montebello Forebay. The total amount of reclaimed water purchased in the water year 1967-68 from the Whittier Narrows Water Reclamation Plant by or on behalf of the Lower Area Parties was therefore 18,275 acre-feet. A typical chemical analysis of the reclaimed water is included in the appendix to this report.

The County Sanitation District No. 21 owns and operates a sewage treatment and water renovation plant near the City of Pomona. The majority of the sewage treated at this plant is delivered to either San Jose Wash near Spadra or into the San Jose Creek at the treatment plant. Minor quantities of the reclaimed sewage are sold for agricultural use. During the 1967-68 water year, a substantial quantity of reclaimed water from this plant reached the Whittier Narrows. Prior to the lining of San Jose Wash, the production of the plant infiltrated above Whittier Narrows. Until 1967 the plant produced about 5 cfs. Therefore, until the water year

1967-68, the amount of reclaimed water from the Pomona Treatment Plant reaching the Lower Area was not significant.

The Corps of Engineers has recently completed the lining of San Jose Wash. This lining has resulted in essentially all of the sewage discharged into the Wash reaching Whittier Narrows as surface flow.

In 1967 the Pomona Treatment Plant was enlarged to a capacity of 12.5 cfs. Another addition is currently under construction, which will increase the capacity to about 22 cfs. With the increased capacity of the treatment plant and the lining of the channel, the flow of reclaimed waste water in San Jose Wash has and will continue to increase significantly.

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 Judgment further provides that any reclaimed water which does not percolate and commingle with ground water in Upper Area is not to be considered Usable Water.

Sewage treated by the Pomona Treatment Plant is generated in the cities of Pomona, Claremont and LaVerne and some unincorporated county territory. A portion of this area lies outside of the watershed of the San Gabriel River System. The Watermaster finds that 55 percent of the sewage treated at the Pomona Treatment Plant was generated inside the watershed of the San Gabriel River System.

The total production at the Pomona Treatment Plant during 1967-68 water year was 6,862 acre-feet. The total sales were 208 acre-feet resulting in 6,654 acre-feet of reclaimed water delivered to San Jose Wash. It is estimated that of this latter amount, 486 acre-feet wasted to the ocean, leaving 6,168 acre-feet as the net amount. The portion of this reclaimed water which was generated inside the watershed of the San Gabriel River system was calculated to be 3,392 acre-feet.

The total amount of Reclaimed Water which should be deducted from the inflow is 21,667 acre-feet for the 1967-68 water year. This is comprised of the 18,275 acre-feet from the Whittier Narrows Water Reclamation Plant and the 3,392 acre-feet of reclaimed water generated inside the watershed originating from the Pomona Treatment Plant.

Makeup Water by Surface Flow Delivery

During the water year 1967-68 the Upper Area purchased no Metropolitan Water District water for delivery to the Lower Area as makeup water. All makeup requirements were fulfilled by payment for reclaimed water previously purchased by Lower Area Parties.

Recirculation of Measured Water

During the water year 1967-68 there was no recirculation of measured water as defined in Paragraph 3 (1) (6) of the Judgment.

Unusable Surface Flow

The water from San Gabriel Valley which flows past the Montebello Forebay 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 on the Rio Hondo at Stewart and Gray Road, Station F45B-R, and on the San Gabriel River at Florence Avenue, Station F262-R. This surface outflow may be comprised of water from the San Gabriel Valley and of local storm water which enters the channel southwesterly of Whittier Narrows.

During water year 1967-68 the measured outflow from the Montebello Forebay on the Rio Hondo at Station F45B-R was 18,360 acre-feet. This included water from San Gabriel Valley and local inflow originating below Whittier Narrows. The daily inflow from tributary channels below Whittier Narrows 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. The total amount of Local Storm Inflow was calculated to be 4,307 acre-feet. By an analysis of daily flows it was possible to segregate the flow at Stewart and Gray Road into Local Storm Outflow and Unusable Surface Flow. It was determined that the Local Storm Outflow was 3,375 acre-feet and the Unusable Surface Flow in the Rio Hondo was 14,985 acre-feet.

As discussed earlier in this report it was necessary to estimate the flow of the San Gabriel River at Florence Avenue Station F262-R. This flow consisted of local storm inflow through storm drains located in the Montebello Forebay and of discharge from San Gabriel Valley. During the storm of late November 1967 the contractor improving the channel experienced considerable difficulties in preventing the water from entering the foundation excavation at drop structures. In early December, to remedy the situation the contractor constructed dikes upstream of each drop structure. These dikes existed until March 8, 1968. During the period from December 1967 through March 8, 1968, there was no outflow of San Gabriel Valley water at Florence Avenue. Estimates of total flow at Florence Avenue for the remainder of the water year were made by the Watermaster. These determinations were based on flows in the San Gabriel River at Parkway Bridge (Station F263C-R), and at Spring Street (Station F42BR), along with local inflow. It was determined that the amount of San Gabriel Valley water which flowed past Florence Avenue, calculated in accordance with provisions of the Judgment, was 2,015 acre-feet.

The total amount of Unusable Surface Flow for the water year 1967-68 was 17,000 acre-feet, consisting of 14,985 acre-feet from the Rio Hondo and 2,015 acre-feet from the San Gabriel River.

Determination of Usable Water

Usable Water under terms of the Judgment is defined as the sum of Surface Flow, Subsurface Flow and Export to Lower Area less Lower Area Replenishment Water, Reclaimed Water, Makeup Water by Surface Flow Delivery, Recirculation of Measured Water and Unusable Surface Flow. Shown in Table 4 is the determination of Usable Water for water year 1967-68.

TABLE 4

USABLE WATER FOR WATER YEAR 1967-68

<u>Item</u>	<u>Amount, in acre-feet</u>
Surface Flow	151,465
Subsurface Flow	20,700
Export to Lower Area	<u>23,395</u>
Subtotal	195,560
Less:	
Lower Area Replenishment Water	95,165
Reclaimed Water	21,667
Makeup Water by Surface Flow Delivery	0
Recirculation of Measured Water	0
Unusable Surface Flow	<u>17,000</u>
Subtotal	<u>133,832</u>
Usable Water	61,728

CHAPTER IV. ACCRUED DEBIT, MAKEUP WATER AND LONG-TERM ACCOUNTING

Under terms of the Judgment, the Watermaster is required to annually determine the Accrued Debit or Credit of the Upper Area and to make a long-term accounting each 15 to 25 years. There is presented herein a summary of Usable Water received, Annual Entitlement, Accrued Debit or Credit and Makeup Water requirement. Also included in this section is a review of determinations for prior years.

Prior Year Determinations

Revised Data

Subsequent to the publishing of the fourth annual Watermaster report on February 29, 1968, the U.S. Geological Survey made minor changes in data which were published. These adjustments resulted from changes made by the U.S. Geological Survey during rechecking of computations subsequent to the time the Watermaster obtained the data. The determination of flow in the Flood Channel for 1966-67 was made by the Los Angeles County Flood Control District because the U.S. Geological Survey gage was inoperative during a portion of the water year.

The flow at the U.S. Geological Survey Flood Channel gage was reported in 1966-67 to be 5,855 acre-feet. The revised value, as published by the U.S. Geological Survey is 5,730 acre-feet--a decrease

of 125 acre-feet. Shown in Table 5 is a summary of the revised findings for the water year 1966-67, which were presented originally on page 34 of the fourth annual Report of Watermaster Service, 1966-67.

TABLE 5
SUMMARY OF REVISED FINDINGS
FOR WATER YEAR 1966-67

<u>Quantities, in acre-feet*</u>		
1. Rainfall 1966-67, 25.03 inches		
2. 10-year average rainfall, 15.9 inches		
3. Lower Area Annual Entitlement		78,700
4. Surface Flow through Whittier Narrows	(176,797)	176,672
5. Subsurface Flow through Whittier Narrows		17,500
6. Water exported through Whittier Narrows		23,395
7. Total flow through Whittier Narrows	(217,692)	217,567
8. Lower Area Replenishment Water		84,156
9. Reclaimed Water		16,224
10. Makeup Water (direct delivery)		0
11. Recirculation of Measured Water		0
12. Unusable Surface Flow		36,534
13. Usable Water received by Lower Area	(80,778)	80,653
14. Credit for water year 1966-67	(2,078)	1,953
15. Accrued Debit of Upper Area as of September 30, 1966 (corrected)		24,238
16. Amount of Makeup Water delivered during water year 1966-67:		
Reclaimed Water	14,735	
Colorado River Water	<u>0</u>	
Total		14,735
17. Adjusted Accrued Debit of Upper Area as of September 30, 1966		9,503
18. Accrued Debit of Upper Area as of September 30, 1967	(7,425)	7,550
19. Minimum amount of Makeup Water required to be delivered to Lower Area prior to October 1, 1968	(2,475)	2,517

* Values shown in parentheses are the previously published figures which have been corrected.

Delivery of Makeup Water

By letter dated October 2, 1967, the Upper District requested of Central Municipal the total number of acre-feet of Reclaimed Water purchased and the cost per acre-foot thereof for the 1966-67 water year. By letter dated October 6, 1967, Central Municipal advised Upper District that it had purchased 16,223.6 acre-feet. The average cost of this water was \$16.05 per acre-foot.

The Upper District elected to purchase the maximum amount of Reclaimed Water permissible under the Judgment. Accordingly, the Upper District made a payment on September 25, 1968 to Central Municipal of \$119,171.25 for 7,425 acre-feet.

Adjusted Accrued Debit

Shown in the following tabulation is the determination of the "Adjusted Accrued Debit" as of September 30, 1967. The Adjusted Accrued Debit as of September 30, 1967 is defined herein as the "Accrued Debit as of September 30, 1967 adjusted for the Makeup Water delivered in 1967-68 water year."

		<u>Quantity, in acre-feet</u>
Accrued Debit of Upper Area as of September 30, 1967 (Table 5, Item 18 corrected)		7,550
Makeup Water Deliveries		
Reclaimed Waste Water	7,425	
Surface Flow delivery	<u>0</u>	
Subtotal		<u>7,425</u>
Adjusted Accrued Debit of Upper Area as of September 30, 1967		125

Accrued Debit and Requirement for Makeup Water for 1967-68

The Lower Area Annual Entitlement, as heretofore determined for 1967-68 is 67,200 acre-feet. The Usable Water received was 61,728 acre-feet, which results in a debit for the water year 1967-68 of 5,472 acre-feet. The Accrued Debit as of September 30, 1968 is the Adjusted Accrued Debit as of September 30, 1967 (125 acre-feet) plus the debit of 5,472 acre-feet for 1967-68, or 5,597 acre-feet.

In accordance with the provisions of the Judgment, Makeup Water amounting to at least one-third of the Accrued Debit must be delivered during water year 1968-69. Therefore, Upper District must deliver a minimum of 1,866 acre-feet of Makeup Water to the Lower Area prior to October 1, 1969.

By letter dated October 2, 1968, the Upper District requested of Central Municipal a statement as to the total number of acre-feet of Reclaimed Water purchased during water year 1967-68 and the cost per acre-foot therefor. By letter dated October 21, 1968, Central Municipal advised Upper District that the Lower Area had purchased 18,275.3 acre-feet of Reclaimed Water during the water year 1967-68 at a cost of \$18.00 per acre-foot. Copies of these letters are included in the appendix to this report.

Table 6 is a summary of operation under the Judgment showing Lower Area Annual Entitlement, Usable Water received by Lower Area and the Accrued Debit of Upper Area for the entire period of operation.

TABLE 6
SUMMARY OF OPERATION UNDER JUDGMENT
(Values in acre-feet)

<u>Water year</u>	Lower Area Annual <u>Entitlement</u>	<u>Water received by Lower Area</u>			Accrued Debitor <u>Credit</u>
		<u>Usable</u>	<u>Makeup</u>	<u>Total</u>	
1963-64	67,200	40,975	0	40,975	-26,225
1964-65	68,000	34,741	13,257	47,998	-46,227
1965-66	70,300	71,272	21,017	92,289	-24,238
1966-67	78,700	80,653	14,735	95,388	- 7,550
1967-68	67,200	61,728	7,425	69,153	- 5,597

Long-term Accounting

The Watermaster is required from time to time, but not sooner than at the end of 15 years, nor later than 25 years after September 30, 1963, to make a long-term accounting of the aggregate amount of Usable Water and Makeup Water received by the Lower Area, compared to a theoretical amount comprised of the base period annual entitlement times the number of years involved adjusted by the ratio of the average annual rainfall to the base period rainfall. A summary of items which will in the future be needed for Long-term Accounting follows:

<u>Water year</u>	<u>Rainfall, in inches</u>		<u>Water received by Lower Area, in acre-feet</u>			
	<u>Annual amount</u>	<u>Accumu- lated average annual amount</u>	<u>Usable</u>	<u>Makeup</u>	<u>Total</u>	<u>Accumu- lated total</u>
1963-64	9.45	9.45	40,975	0	40,975	40,975
1964-65	15.24	12.34	34,741	13,257	47,998	88,973
1965-66	19.61	14.77	71,272	21,017	92,289	181,262
1966-67	25.03	17.33	80,653	14,735	95,388	276,650
1967-68	15.03	16.87	61,728	7,425	69,153	345,803

CHAPTER V. SUMMARY OF FINDINGS
FOR WATER YEAR 1967-68

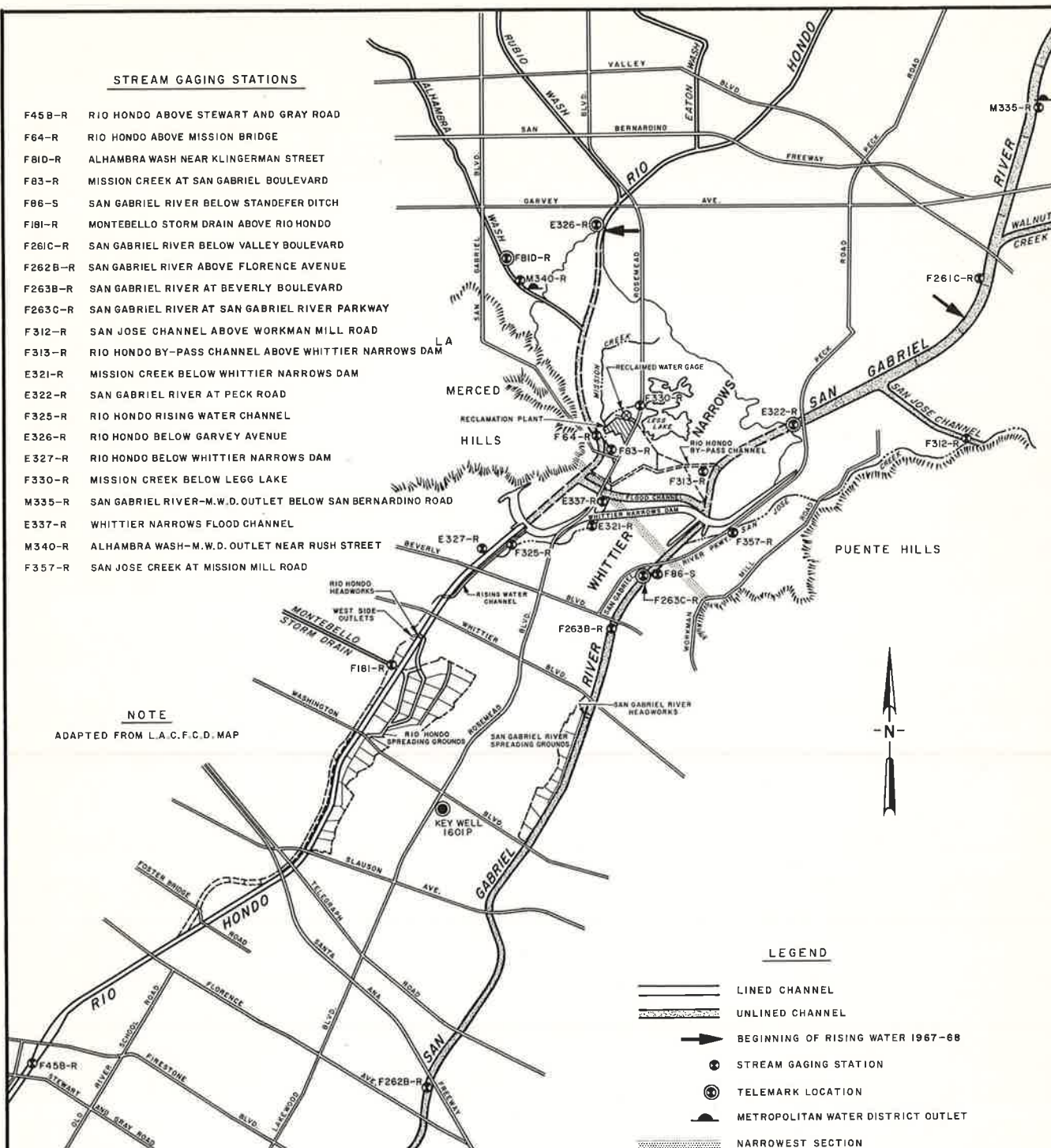
The findings of the Watermaster for water year 1967-68 are as follows:

	<u>Quantities in acre-feet</u>
1. Rainfall 1967-68, 15.03 inches	
2. 10-year average rainfall, 14.4 inches	
3. Lower Area Annual Entitlement	67,200
4. Surface Flow through Whittier Narrows	151,465
5. Subsurface Flow through Whittier Narrows	20,700
6. Water exported through Whittier Narrows	23,395
7. Total flow through Whittier Narrows	195,560
8. Lower Area Replenishment Water	95,165
9. Reclaimed Water	21,667
10. Makeup Water (Surface Flow delivery)	0
11. Recirculation of Measured Water	0
12. Unusable Surface Flow	17,000
13. Usable Water received by Lower Area	61,728
14. Debit for water year 1967-68	5,472
15. Accrued Debit of Upper Area as of September 30, 1967 (as revised herein)	7,550
16. Amount of Makeup Water delivered during water year 1967-68	
Payment for Reclaimed Water	7,425
Surface Flow Delivery	<u>0</u>
Total	7,425
17. Adjusted Accrued Debit of Upper Area as of September 30, 1967	125
18. Accrued Debit of Upper Area as of September 30, 1968	5,597
19. Minimum amount of Makeup Water required to be delivered to Lower Area prior to October 1, 1969	1,866

STREAM GAGING STATIONS

- F45B-R RIO HONDO ABOVE STEWART AND GRAY ROAD
- F64-R RIO HONDO ABOVE MISSION BRIDGE
- F81D-R ALHAMBRA WASH NEAR KLINGERMANN STREET
- F83-R 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
- F262B-R SAN GABRIEL RIVER ABOVE FLORENCE AVENUE
- F263B-R SAN GABRIEL RIVER AT BEVERLY BOULEVARD
- F263C-R SAN GABRIEL RIVER AT SAN GABRIEL RIVER PARKWAY
- F312-R SAN JOSE CHANNEL ABOVE WORKMAN MILL ROAD
- F313-R RIO HONDO BY-PASS CHANNEL ABOVE WHITTIER NARROWS DAM
- E321-R MISSION CREEK BELOW WHITTIER NARROWS DAM
- E322-R SAN GABRIEL RIVER AT PECK ROAD
- F325-R RIO HONDO RISING WATER CHANNEL
- E326-R RIO HONDO BELOW GARVEY AVENUE
- E327-R RIO HONDO BELOW WHITTIER NARROWS DAM
- F330-R MISSION CREEK BELOW LEGG LAKE
- M335-R SAN GABRIEL RIVER-M.W.D. OUTLET BELOW SAN BERNARDINO ROAD
- E337-R WHITTIER NARROWS FLOOD CHANNEL
- M340-R ALHAMBRA WASH-M.W.D. OUTLET NEAR RUSH STREET
- F357-R SAN JOSE CREEK AT MISSION MILL ROAD

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



LEGEND

- LINED CHANNEL
- - - UNLINED CHANNEL
- ➔ BEGINNING OF RISING WATER 1967-68
- STREAM GAGING STATION
- ⊙ TELEMARK LOCATION
- ⬇ METROPOLITAN WATER DISTRICT OUTLET
- ⋯ NARROWEST SECTION

SAN GABRIEL RIVER WATERMASTER

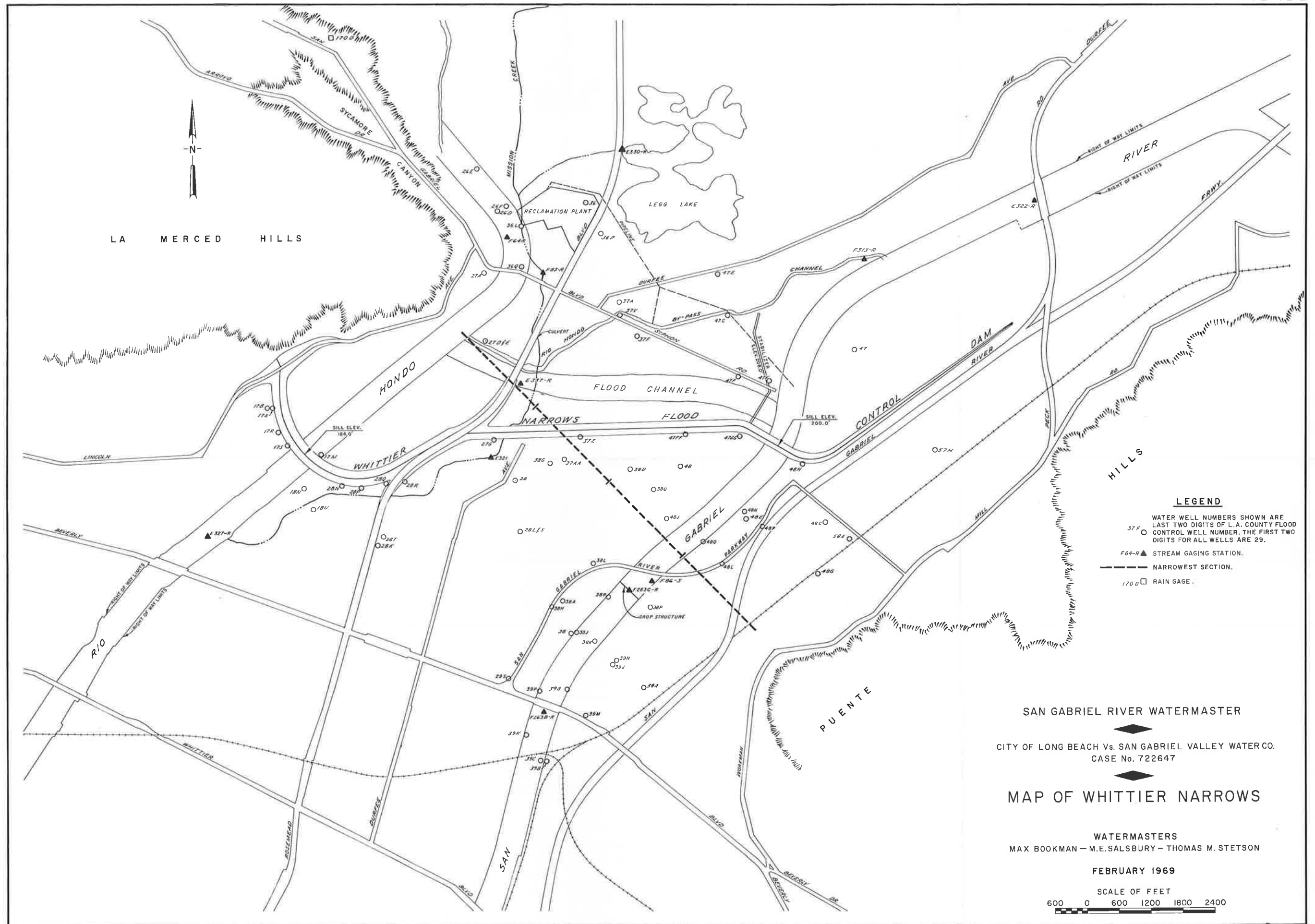
CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647

STREAM GAGING STATIONS
RIO HONDO - SAN GABRIEL RIVER SYSTEM

WATERMASTERS
MAX BOOKMAN - M.E. SALSURY - THOMAS M. STETSON

FEBRUARY 1969

SCALE OF FEET
0 4000 8000



APPENDIX



UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT

11229 Valley Boulevard

El Monte, California 91731

Glbert 3-2297

Directors: Frank E. Vachon, President • Robert T. Radford, Vice-President • Howard H. Hawkins, Sec'y-Treas. • Roy L. Anderson • Travis L. Manning

October 2, 1968

Board of Directors
Central Basin Municipal Water District
7439 E. Florence Avenue
Downey, California

Gentlemen

In accordance with provisions of Paragraph 5 (1) (2) of the judgment in the Long Beach case, will you please furnish a statement as to the total number of acre feet of reclaimed water purchased and the cost per acre foot therefor, for the water year commencing October 1, 1967.

It will be appreciated if this information is furnished at your earliest convenience, as it is needed at an early date in connection with planning for delivery of required make-up water under terms of the judgment.

Very truly yours

Jane M. Bray
Deputy Secretary

CC: San Gabriel River Watermaster

DIRECTORS

MILO DELLMANN, *President*
ROBERT J. FURLONG
CLINTON O. HARRIS
CLAIRE S. THOMPSON, JR.
FRANK H. WHEELLOCK

**CENTRAL BASIN
MUNICIPAL WATER DISTRICT**

7439 EAST FLORENCE AVENUE
DOWNEY, CALIFORNIA 90240
927-2611 • 773-5790

October 21, 1968

**Board of Directors
Upper San Gabriel Valley
Municipal Water District
Suite 202, Neer Building
11229 Valley Boulevard
El Monte, California 91731**

Gentlemen:

**In accordance with provisions of Paragraph 5 (i) (2)
of the Judgment in the Long Beach case, written notice
is hereby given of the total number of acre feet of
reclaimed water purchases, and of the cost per acre
foot, at the existing Whittier Narrows Water Reclama-
tion Plant for the water year commenced October 1, 1967,
as follows:**

October 1, 1967 through September 30, 1968

18,275.3 acre feet @ \$18.00 per acre foot

Very truly yours,

**Marvel A. Roberts
Deputy Secretary**

MAR:m

**cc: Max Bookman, Watermaster
M. E. Salisbury, Watermaster
Thomas M. Stetson, Watermaster**

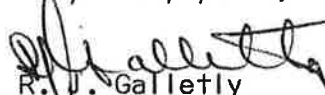
R. J. GALLETTY
CERTIFIED PUBLIC ACCOUNTANT
GLENDALE FEDERAL SAVINGS & LOAN BUILDING
401 NORTH BRAND BOULEVARD
GLENDALE 3, CALIFORNIA
CHAPMAN 5-2402

November 11, 1968

San Gabriel River Watermaster
Security Building, Room 604
102 North Brand Blvd.
Glendale, California

In our opinion the accompanying statement of Income and Expenditures for the San Gabriel River Watermaster for the water year 1967 - 1968 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.

Very truly yours,



R. J. Galletly
Certified Public Accountant

San Gabriel River Watermaster
Statement of Income and Expenditures
For the Water Year 1967 - 1968

Carried forward from year 1966 - 1967		\$ 2,476.01
Income		<u>14,000.00</u>
		16,476.01
Expenditures		
Administrative fees and general operating expenses	\$ 1,826.35	
Field inspections	1,178.40	
Collection of data and maintenance of records	2,814.21	
Calculations and preparation of Watermaster Reports for water years 1967 - 1968	2,628.91	
Printing and reproduction costs	<u>556.61</u>	
Total expenditures		<u>9,004.48</u>
Balance		\$ <u><u>7,471.53</u></u>

SELECTED WATER QUALITY ANALYSIS OF RECLAIMED WATER
FROM THE WHITTIER NARROWS WATER RECLAMATION PLANT

Composite: 8:00 a.m. July 9 to 8:00 a.m. July 10, 1968

<u>Constituents</u>	<u>Final Effluent</u>	<u>Maximum Limits</u>
BOD, 5 days at 20°C, ppm	3	
Suspended Solids, ppm	6	
Total dissolved Solids, ppm	608	1,000
Sulfate, ppm	101	
Chloride, ppm	98	250
Sulfate and Chloride	199	500
Boron, ppm	0.67	2.0
Sodium Equivalent Ration, %	52.9	60.0
MBAS, ppm	0.4	2.0
Phenol, ppm	0.002	
Lead, ppm	0.01	0.1
Fluoride, ppm	0.88	1.5
Arsenic, ppm	0.000	0.05
Selenium, ppm	0.00	0.05
Chromium, Hexavalent, ppm	0.02	0.05
Copper, ppm	0.02	3.0
Iron, ppm	0.09	
Manganese, ppm	0.00	
Iron + Manganese, ppm	0.09	0.3
Zinc, ppm	0.27	15