

SAN DIEGO COUNTY
WATER AUTHORITY



THIRTEENTH ANNUAL REPORT
1959

SAN DIEGO COUNTY WATER AUTHORITY

THIRTEENTH
ANNUAL REPORT
of Authority Operations

For

Fiscal Year Ending June 30, 1959

Richard S. Holmgren
General Manager and Chief Engineer

SAN DIEGO, CALIFORNIA

1959

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BOARD OF DIRECTORS
1958 - 59



Vice Chairman
W. Ray Coyle
South Bay
Irrigation District
6-53 to 6-59



Chairman
Fred A. Heilbron
San Diego
7-44 to 6-59



Secretary
Hans H. Doe
Buena Colorado
Municipal Water District
6-54 to 6-59



R. E. Badger
Santa Fe
Irrigation District
9-57 to 6-59



Ralph E. Barger
Otay Municipal
Water District
12-56 to 6-59



Paul Beckmann
San Diego
2-53 to 6-59



Baylor Brooks
San Diego
5-54 to 6-59



Donald Burnham
San Diego
5-54 to 6-59



Herbert H. Carter
Ramona Municipal
Water District
10-57 to 6-59



Charles A. Cryser
Ricon del Diablo
Municipal Water District
6-54 to 6-59



Guy C. Earl, Jr.
Rainbow Municipal
Water District
12-58 to 6-59



Harry Griffen
Helix
Irrigation District
7-56 to 6-59



Charles W. Hales
San Dieguito
Irrigation District
6-58 to 6-59



G. R. Henderson
San Diego
10-55 to 6-59



C. Hap Holliday
San Diego
6-59 to 6-59

BOARD OF DIRECTORS
1958 - 59
(Continued)



C. P. Kane
Valley Center
Municipal Water
District
2-59 to 6-59



Charles G. Kerch
National City
5-57 to 6-59



George Ketrigan
San Diego
9-53 to 6-59



H. Fred Landgraf
San Diego
10-55 to 6-59



C. A. Larsen
San Diego
5-59 to 6-59



R. M. Levy
Helix
Irrigation District
5-53 to 6-59



Arthur H. Marston
San Diego
7-44 to 6-59



Lloyd M. Mitchell
Escondido
12-56 to 6-59



Charles C. Price
Rio San Diego
Municipal
Water District
7-58 to 6-59



William W. Rogers
Carlsbad Municipal
Water District
6-54 to 6-59



Franz R. Sachse
Fallbrook Public
Utility District
10-56 to 6-59



T. Franklin Schneider
San Diego
11-54 to 5-59



David R. Shepardson
Poway Municipal Water
District
4-54 to 6-59



Fred W. Simpson
San Diego
7-44 to 6-59



Robert A. Weese
Oceanside
5-55 to 6-59



Arthur C. Wells
San Diego
2-53 to 6-59

SAN DIEGO COUNTY WATER AUTHORITY

MEMBER AGENCIES AS OF JUNE 30, 1959

<i>Member Agencies</i>	<i>Date of Entry</i>
Cities	
Escondido	Oct. 9, 1950
National City	June 9, 1944
Oceanside	June 9, 1944
San Diego	June 9, 1944
Irrigation Districts	
Helix	June 9, 1944
San Dieguito	Dec. 13, 1948
Santa Fe	Dec. 13, 1948
South Bay	Nov. 3, 1952
(Includes City of Chula Vista, an independent member agency, from June 9, 1944 to Nov. 3, 1952)	
Municipal Water Districts	
Bueno Colorado	June 11, 1954
Carlsbad	June 16, 1954
Otay	Oct. 26, 1956
Poway	April 21, 1954
Rainbow	April 10, 1954
Ramona	August 27, 1957
Rincon del Diablo	June 14, 1954
Rio San Diego	June 7, 1956
(Includes Lakeside I.D., an independent member agency from June 9, 1944 to June 7, 1956.)	
Valley Center	May 9, 1955
Public Utility District	
Fallbrook	June 9, 1944

COMMITTEES OF THE BOARD

June 30, 1959

ENGINEERING AND OPERATIONS	WATER PROBLEMS
Paul Beermann, Chairman	Hans H. Doe, Acting Chairman
Robert A. Weese, Vice Chairman	R. E. Badger
R. E. Badger	Paul Beermann
Baylor Brooks	W. Ray Coyle
Herbert H. Carter	Fred A. Heilbron
Charles A. Crytser	George R. Henderson
Hans H. Doe	C. P. Kane
Charles W. Hales	C. A. Larsen
George R. Henderson	R. M. Levy
C. P. Kane	William W. Rogers
C. A. Larsen	Franz R. Sachse
Lloyd M. Mitchell	Fred W. Simpson
ORGANIZATION, PERSONNEL AND PUBLIC RELATIONS	FINANCE AND INSURANCE
Fred W. Simpson, Chairman	Arthur C. Wells, Chairman
David R. Shepardson, Vice Chairman	Harry Griffen, Vice Chairman
Ralph E. Barger	Ralph E. Barger
Baylor Brooks	Donald C. Burnham
Herbert H. Carter	W. Ray Coyle
W. Ray Coyle	Charles A. Crytser
Guy C. Earle, Jr.	C. Hap Holliday
Charles W. Hales	George Kerrigan
Charles G. Kerch	H. Fred Landgraf
Charles C. Price	R. M. Levy
Robert A. Weese	Lloyd M. Mitchell
LANDS AND RIGHTS OF WAY	Charles C. Price
Donald C. Burnham, Chairman	LEGAL AND CLAIMS
Wm. W. Rogers, Vice Chairman	Donald C. Burnham, Chairman
Harry Griffen	Franz R. Sachse, Vice Chairman
Charles G. Kerch	Guy C. Earl, Jr.
H. Fred Landgraf	Harry Griffen
Lloyd M. Mitchell	C. Hap Holliday
Franz R. Sachse	Charles G. Kerch
David R. Shepardson	George Kerrigan
EXECUTIVE OFFICERS AND OPERATING STAFF	H. Fred Landgraf
General Manager and Chief Engineer.....	William W. Rogers
General Counsel.....	David R. Shepardson
Assistant Chief Engineer.....	Arthur C. Wells
Controller.....	EXECUTIVE OFFICERS AND OPERATING STAFF
Treasurer.....	General Manager and Chief Engineer.....
Executive Secretary and Asst. Treasurer.....	Richard S. Holmgren
Project Design Engineer.....	General Counsel.....
Superintendent, Maintenance and Operation.....	William H. Jennings
	Assistant Chief Engineer.....
	Allen H. Jones
	Controller.....
	Charles L. Royer
	Treasurer.....
	Harry L. Hall
	Executive Secretary and Asst. Treasurer.....
	Dorothy D. Miller
	Project Design Engineer.....
	James P. Larney
	Superintendent, Maintenance and Operation.....
	Joseph E. Lester



Messrs. P. Beermann, F. Heilbron and R. Holmgren Inspecting Second Aqueduct Crossing Under City of San Diego's El Monte Pipeline at Baltimore Drive in La Mesa



SAN DIEGO COUNTY WATER AUTHORITY

2130 FOURTH AVENUE
SAN DIEGO 3, CALIFORNIA

November 15, 1959

Board of Directors
San Diego County Water Authority
B u i l d i n g

Gentlemen:

Transmitted herewith is the Thirteenth Annual Report, covering operations of the Authority for the 1958-59 fiscal year, as prescribed in Ordinance No. 2, adopted by the Board of Directors December 1, 1944.

As indicated in this report, the area included within the boundaries of the Authority has again increased substantially, to a total of 520,853 acres, indicating the need for additional water throughout the county. It will also be observed that completion of the Second San Diego Aqueduct is on schedule, and barring unforeseen circumstances the aqueduct will be completed by November 30, 1960.

It is with pleasure that I acknowledge the spirit of cooperation existing among both the employees of the Authority and the contractors who are constructing the aqueduct. Each has done his work well.

Respectfully,
Richard S. Holmgren
General Manager and Chief Engineer

CITIES
ENCINITAS
NATIONAL CITY
OCEANBEACH
SAN DIEGO

IRRIGATION DISTRICTS
HELIEX
SAN DIEGO
SANITA FE
SOUTH BAY

MEMBER AGENCIES
PUBLIC UTILITY DISTRICTS
FALLBROOK

MUNICIPAL WATER DISTRICTS
BUENA VISTA
CARLSBAD
ESSEX
FOUNTAIN
MIRAMONTE
SAN MAR
VALLEY CENTER

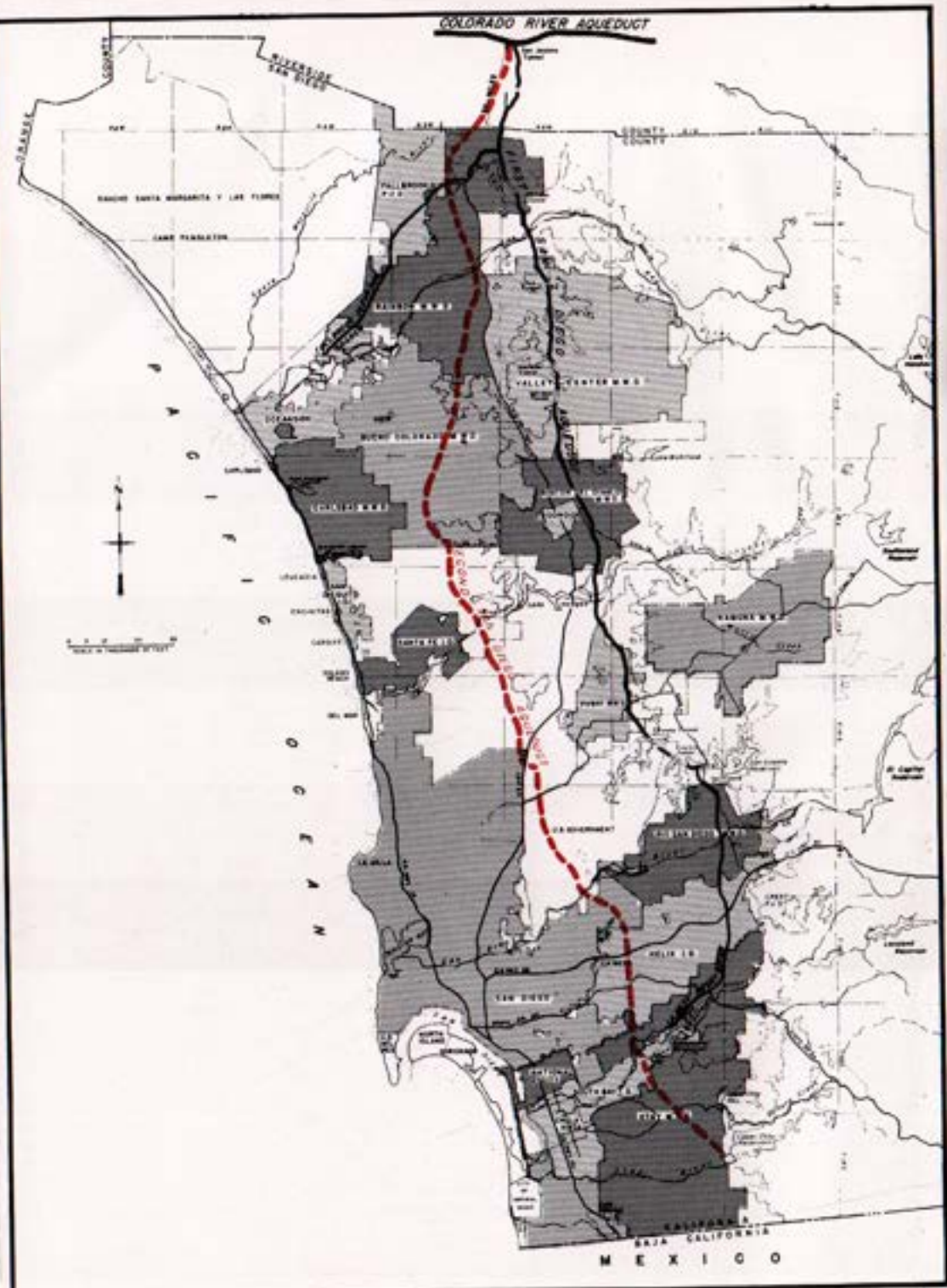


Figure A. Authority area within San Diego County

AUTHORITY HIGHLIGHTS IN BRIEF

	1958-59	1957-58	Percent Change
GROWTH OF AREA			
Number of Agencies	18	18	0
Total Area—Acres	520,853	465,313	+11.9
Population	909,000	842,600	+ 7.9
Assessed Valuation	\$1,121,860,510	\$1,005,122,640	+11.6
USE OF WATER			
Water Imported Through Aqueduct—ac. ft.	101,477.8	142,252.8	—28.7
Total Water Production of Agencies—ac. ft.	187,839	148,579	+ 26.4
FINANCIAL			
INCOME:			
From Water Revenue	\$ 1,556,396	\$ 1,976,959	—21.3
From Taxes	\$ 1,171,875	\$ 961,389	+ 21.9
EXPENDITURES:			
Salaries	\$ 464,690	\$ 415,575	+11.8
Operation & Maintenance	\$ 1,549,104	\$ 1,914,476	—19.1
New Construction	\$13,069,010	\$ 2,064,589	+ 533.0
Total Investment in Utility Plant at Year End	\$69,030,710	\$53,281,841	+ 29.6

REPORT OF THE AUTHORITY AND ITS OPERATIONS

For Fiscal Year 1958-59

GROWTH OF AUTHORITY

Area

The area of the Authority continued to increase during the 1958-59 fiscal year from a total of 465,313 acres on June 30, 1958 to 520,853 acres on June 30, 1959, an increase of 55,540 acres or 12 percent. The number of member agencies within the Authority remains at 18, with the increase in area resulting from annexation to existing member agencies.

The largest individual increase to the area of the Authority resulted from the annexation of the Del Mar Terrace-Miramar Tract to the City of San Diego, an area of 25,591 acres which automatically became Authority area. (Lands annexed to City member agencies of the Authority are automatically annexed to the Authority.) The land annexed generally lies northerly of the City between Del Mar and Highway 395. The City of Oceanside annexed lands totaling 6,450 acres lying in the San Luis Rey River Valley. These lands also became Authority area. A number of smaller annexations to the Authority occurred from annexations to the Cities of San Diego, National City and Oceanside.

In November of 1958 the Fallbrook Public Utility District and the Authority concurrently annexed an area totaling 7,277 acres lying north of the District's boundaries and extending to the Riverside County line. The site of the proposed Fallbrook Reservoir on the Santa Margarita River lies within the area included by this annexation. The Rainbow Municipal Water District and the Authority concurrently annexed four parcels of land totaling 6,300 acres. The Helix Irrigation District completed its annexation of 363 acres, which was concurrently annexed to the Authority. However, the City of San Diego annexed 42 acres of Helix Irrigation District area, and for this report this area is considered in the City of San Diego. Also Helix excluded five acres which was simultaneously annexed to the Rio San Diego Municipal Water District. The Ramona Municipal Water District completed its first annexation of 9,300 acres, which was concurrently annexed to the Authority.

As of June 30, 1959, the 520,853 acres lying within the boundaries of the Authority represent 19.1 percent of the 2,725,100 acres lying within the County of San Diego.

The total area lying within the boundaries of each member agency as of June 30, 1959 is shown pictorially on Figure A and in Table 1, where the area annexed or excluded from each agency during the 1958-59 fiscal year is shown.

Population

As of June 30, 1959 the population of San Diego County is estimated to be 1,006,800, an increase of 63,800, or 6.8 percent above the 943,000 persons estimated to be residing in the county on June 30, 1958. The present population represents a gain of 450,000 persons above the 556,800 population in 1950, as determined by the U. S. Bureau of Census. This is an annual growth of 50,000 persons, equal to an annual average growth of 9.0 percent.

The population residing in San Diego County and in the area of the Authority, as determined by the U. S. Bureau of Census each decade from 1910 to 1950, is shown in Table 2, together with estimated county and Authority population figures for 1957, 1958 and 1959. This table shows that 90 percent of the people residing within the county live within areas served with Authority water.

Wherever available, the estimated population of each member agency in 1959 is shown in Table 3, together with the estimated increase since 1950. Also shown in this table is the average population density within each agency.

Assessed Valuation

The large industrial and agricultural growth occurring within the area of the Authority is reflected in the increase of \$116,737,870 over 1957-58 to a total of \$1,121,860,510 in assessed valuation of taxable property for the fiscal year 1958-59. These figures represent an 11.6 percent increase in assessed valuation. The assessed valuation of taxable property within each member agency for 1958-59 and the increase over 1957-58 are shown in Table 4.

In order that the County Assessor obtain the basic information required to determine the 1958-59 assessed valuation of taxable property within the boundaries of each Authority member agency which occurred during the year, a certified statement of boundary changes was submitted to the Authority by its member agencies. A certificate of boundary changes of the Authority was then prepared incorporating

all changes, which was filed with the County Assessor, the State Board of Equalization, and the Metropolitan Water District of Southern California prior to February 1, 1959, the date the County fixes the area on which the 1959-60 assessed valuation is determined.

Prior to publication of this annual report, the assessed valuation of taxable property for the 1959-60 fiscal year was made available to the Authority by the County Assessor. Assessed valuation for the 1959-60 fiscal year for each member agency has therefore been included in Table 4 for convenience of reference. An assessed valuation of \$1,259,627,550 was determined for the 1959-60 fiscal year, an increase of \$137,767,040, equal to 12.3 percent over the 1958-59 fiscal year.

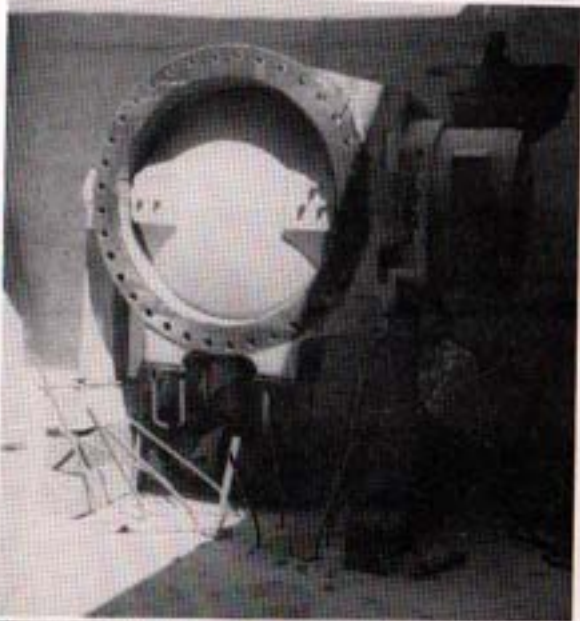
The largest percentage increase occurred in the Santa Fe Irrigation District, equal to 36.3 percent. The smallest increase occurred in the City of Oceanside, equal to 4.6 percent.

WATER SUPPLY AND CONSUMPTION

Water Supply

The Authority's water supply consists entirely of Colorado River water obtained from The Metropolitan Water District of Southern California as a member agency of that District. Water is received by the Authority from the District system at a point six miles inside San Diego County. Water is carried to this point by the northerly one-half of the First San Diego Aqueduct after being diverted from the District's Colorado River Aqueduct at San Jacinto. The design capacity of the two barrels of the First Aqueduct is 180 c.f.s, but flows as high as 200 c.f.s have been carried without damage, although the hydraulic gradients in open structures were somewhat higher than the design elevation, with a resulting decrease in freeboard and a smaller factor of safety. A flow of 190 c.f.s. can be carried with little danger.

The above-normal rainfall during the winter of 1957-58 resulted in a fairly large increase in water stored in local reservoirs. This resulted in a reduced demand for Authority water, and on July 18, 1958 the flow of the First Aqueduct was reduced to 140 c.f.s. Light rains during the winter of 1958-59 and only 50 percent of normal rainfall during the fiscal year failed to provide additional local water. On March 1, 1959 orders for water delivery and for storage were such that the Metropolitan Water District was requested to begin delivery to the Authority of as much water as the aqueduct would carry. Flows were increased to about 198 c.f.s. and continued at this rate throughout the balance of the year except for three short periods.



From December 18 to 24, 1958 flows were discontinued on the Colorado River Aqueduct to permit the removal of bulkheads by the Metropolitan Water District and to place additional siphons and install pumping units on the aqueduct under the District expansion program. During this period, flows to the Authority were maintained on a reduced scale from water stored in San Jacinto Reservoir.

The second barrel of the First Aqueduct was bulkheaded off and dewatered in June of 1959 from San Jacinto to Rainbow to permit the installation of two crossconnections in Rainbow Pass between the First and Second San Diego Aqueducts. During this shutdown flows to the Authority were reduced to the capacity of the first barrel of the First Aqueduct.

In the late spring Authority storage in San Vicente Reservoir approached available capacity, and flows were reduced in the aqueduct in order not to exceed the allowable storage capacity of 20,000 acre feet.

The quantity of water supplied to the Authority during 1958-59 totaled 101,478 acre feet, a reduction of 40,775 acre feet below the 142,253 acre feet delivered in the previous year.

*Vent Structure
Valve at Crossconnection
Flange for Blowoff*

By contract the Authority continued to transport water for the Metropolitan Water District to two areas outside the Authority and the Metropolitan boundaries. The water was delivered directly to the State Forestry Camp at Rainbow and to the Poway Municipal Water District (an Authority member agency) for delivery to the Convair missile testing facility lying outside Poway boundaries in Sycamore Canyon within the federal government's Camp Elliott. The total quantity of water delivered to these two areas totaled only 92 acre feet, or about one tenth of one percent of the total quantity received from the Metropolitan Water District.

Water Deliveries

A total of 94,589 acre feet of water was delivered by the Authority to its member agencies during 1958-59. This quantity met the supplemental needs of Authority member agencies, representing a decrease of 45,015 acre feet from 139,604 acre feet delivered in 1957-58. The decrease resulted from utilization of the local supplies which were substantially improved by the above-mentioned normal runoff in 1957-58.

A breakdown showing deliveries made by the Authority to each agency by months is shown in Table 5.

During the year water was delivered to each member agency with the exception of the Santa Fe and the San Dieguito Irrigation Districts, both of which receive water under agreements with the City of San Diego from its Lake Hodges supply. The demand for Authority water was higher than in 1957-58 by all member agencies except the City of San Diego, the City of National City, and the South Bay Irrigation District, the last two agencies being served by the California Water and Telephone Company. The City of San Diego and the California Water and Telephone Company have large storage reservoirs for impounding local runoff and were benefited from the near normal runoff in 1957-58.

The largest quantity of water delivered in any one month to member agencies totaled 13,987 acre feet and occurred in the month of May, 1959. The minimum totaled 3,086 acre feet and occurred in the month of February, 1959. A breakdown of the total quantity of water delivered by the Authority to each of its member agencies each year during the past decade is shown in Table 6.

Water Rates

On July 1, 1958 the Metropolitan Water District put into effect a new water rate, under which the price for untreated water (the only kind used by the Authority) was increased from \$12.00 to \$15.00 per acre foot, except for untreated water used for agriculture or for storage in underground storage basins. The Authority water rate to its member agencies is fixed by ordinance at a price of \$2.00 per acre foot above the Metropolitan Water District rate, or \$17.00 per acre foot, except for water used for agricultural purposes which remains at \$14.00 per acre foot.

The Authority has adopted the procedure whereby all water delivered during a month is billed to the agency at the full price of \$17.00 per acre foot. An agency desiring a rebate for water used for agricultural purposes then files with the Authority a certified statement to this effect as soon thereafter as possible. These statements form the basis for a certified request for a rebate by the Authority to the Metropolitan Water District. When received, the rebate is passed on to the member agency in accordance with its certified statement.

Water Production of Member Agencies

The term "water production" is used to designate the quantity of water which an agency diverts or produces from all of its sources of water supply, including water required to meet the demands of its consumers, losses sustained in transmission lines and in the distribution system, and evaporation and seepage losses occurring in reservoirs and tanks within the distribution system. Runoff from local streams stored for future use in impounding reservoirs is not considered as water production until such impounded water is diverted into an agency's system to meet current needs. Losses from evaporation and seepage occurring during the storage period are not considered as water production, since they are considered in determining the safe yield from such reservoirs and their contributory watershed area. Water production of an agency includes only that water produced by the public agency, or one of its subagencies and delivered through a distribution system to consumers. Water obtained from private wells located on a property and used by the owner thereon is not included as part of an agency's water production.

The total quantity of water produced by member agencies of the Authority for the 1958-59 fiscal year is 187,839 acre feet, or 39,260 acre feet more than the quantity produced in 1957-58. This represents

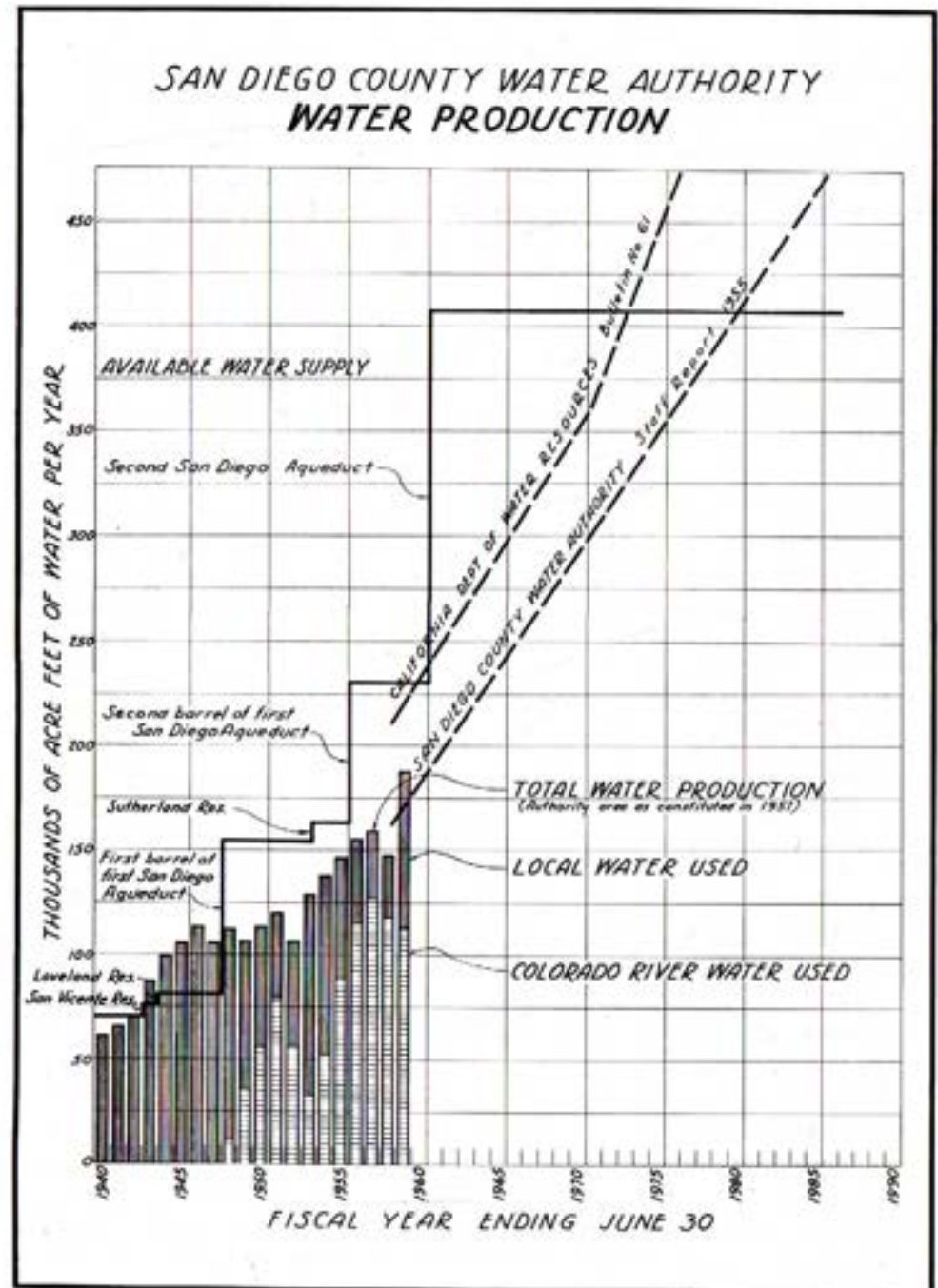


Figure B. Water Production of Authority Member Agencies.

SAN DIEGO COUNTY WATER AUTHORITY

an increase of 26.2 percent, the largest increase in any year since the formation of the Authority in 1944.

Water production of each member agency is shown in Table 7, and the percentage of Authority and local water used by the agencies is shown in Table 8. The largest increase, not including the Ramona and Otay Districts, which have only begun using water within the last two years, occurred in the Poway and Rainbow Districts, with about 73 percent increase in water production over that of the previous year. The lowest increase occurred in the Valley Center District, with an increase of only one percent.

Authority water accounted for 113,238 acre feet, or 60.3 percent of the total water produced for distribution in Authority area. As is shown in Table 8, the Otay, Poway, and Valley Center Districts relied entirely on the Authority for their water. Excluding the San Dieguito and the Santa Fe Districts, which used no Authority water, the smallest percentage use was by the Buena Colorado District, with only 18 percent of its water coming from the Authority. Of the total water in 8 of the 18 member agencies, more than 75 percent was supplied by the Authority.

The water production of each agency, on the basis of population and gross area, is shown in Table 9. The area used in this comparison is the entire area within the district actually capable of being served with water from present system. Therefore, the gross area includes the area of streets, parks and unused lands lying within the area served. This unit measure is easy to obtain and is useful in estimating future trends, since the proportion of the area not using water, such as streets, parks et cetera, would remain fairly constant as the area develops.

As shown in Table 9, the average water use per capita during the year in the Authority area is 0.20 acre feet (178 gallons per day per capita), with the highest use of 2.79 acre feet (2,490 gallons per day per capita) occurring in the Rainbow District and the minimum of 0.07 acre feet (62 gallons per day per capita) occurring in the Otay and Ramona Districts.

Water production per gross watered area for the entire area of the Authority, as shown in Table 9, averaged 0.75 acre feet per acre per year. The highest rate of use occurred in the South Bay District, where 1.32 acre feet per acre were used. The lowest per acre use occurred in the Otay District, with a use of only 0.04 acre feet per acre for the year.

WATER SUPPLY AND CONSUMPTION

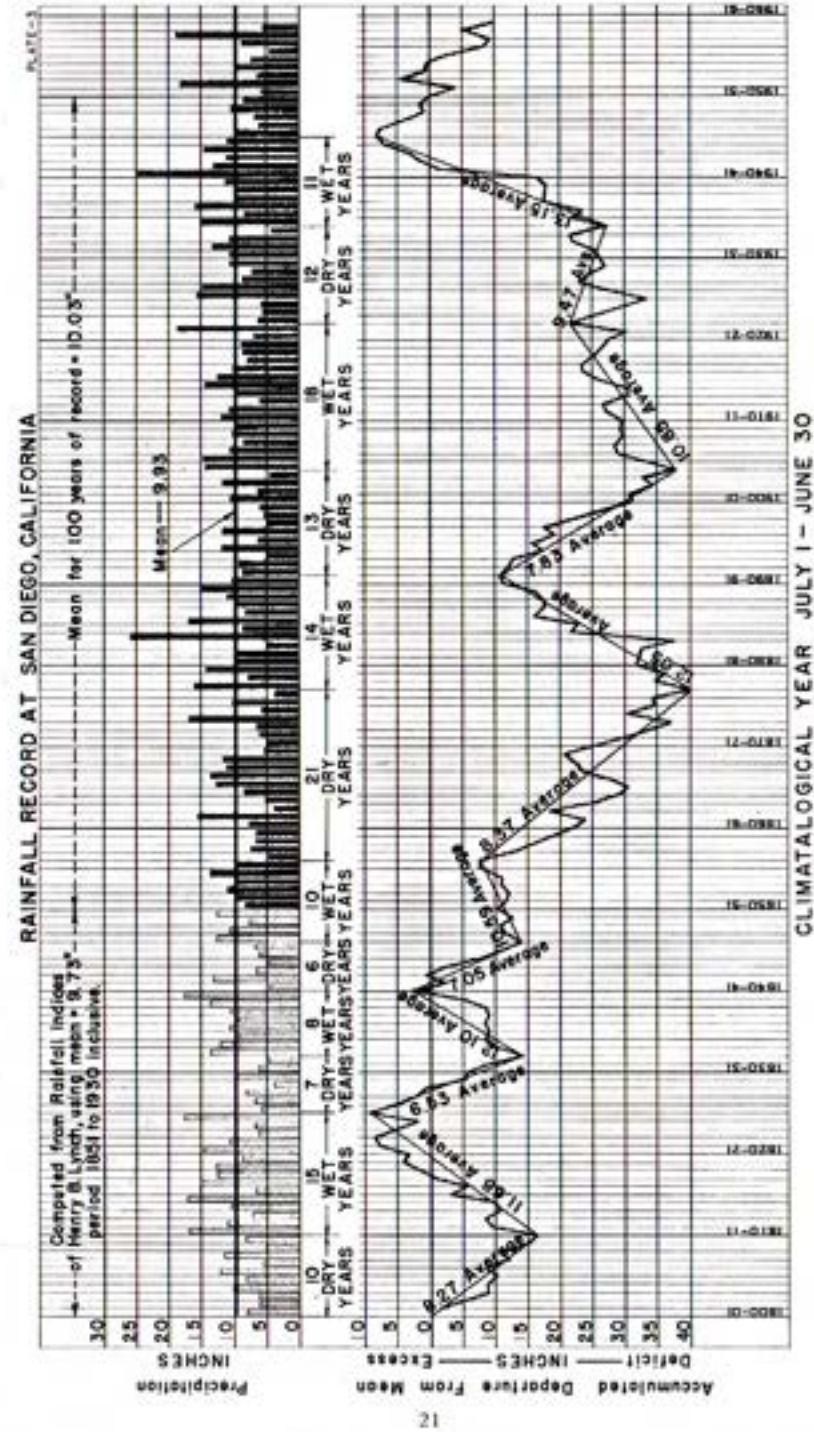


Figure C. Rainfall record at San Diego, California.

For the use of storage in the reservoir, the agencies pay monthly their proportionate part of water lost by evaporation in San Vicente Reservoir. The agencies also pay a proportionate part of the Authority's annual payment to the City of San Diego for the right to store water in the reservoir. The total payment to the City is based on the maximum amount of water in storage during the year at a cost of \$2.20 per acre foot. The agency also pays a charge of 50¢ per acre foot, at the time the water is transferred, to reimburse the City for the cost of pumping the transferred water from the lower level of the lake. If the in lieu water were not transferred to the City at the lower level, the City would take the water at the end of the aqueduct, where the elevation is sufficiently high for water to flow by gravity to the City's distribution system.

In February of 1959 a canvass was made of member agencies to determine the need for stored water to carry through 1959. The canvass indicated that all agencies would require the storage of water to which they have a preferential right and that an additional 6,340 acre feet would be needed by Fallbrook, Poway and Rainbow Districts to meet the needs of their consumers.

After completion of negotiations in February of 1959, the Authority entered into a supplemental agreement with the City of San Diego April 16, 1959, in which the Authority was permitted to store an additional 6,340 acre feet in San Vicente Reservoir. On March 15, 1959 a total of 26,340 acre feet of water was stored in the reservoir. Immediately thereafter, delivery of water in accordance with preferential right was begun, and delivery of in lieu water from storage was started. During the fiscal year, the Authority delivered 12,398 acre feet of water from storage. An amount of 17,154 acre feet was available on June 30, 1959 to carry the agencies through the year. It would appear that ample storage exists to meet the needs throughout the remainder of 1959, but some transfer of stored water may be necessary.

The quantity of Authority storage in San Vicente Reservoir at the beginning of the fiscal year, the amounts placed into storage and withdrawn from storage during the year, and the total quantity in storage on June 30, 1959 are shown in Table 11.

Water Quality

Monthly samples of the natural Colorado River water delivered to the First Aqueduct at the west portal of San Jacinto are taken by
Because of the special reduced rate established for water used for

Because of the special reduced rate established for water used for agriculture, it has been possible for the first time to determine the extent to which water is used for agricultural purposes. As shown in Table 10, of the total 184,240 acre feet of water produced in Authority area, 62,273 acre feet or 33.8 percent, was used for the growing of agricultural products for the commercial market. Of this total, the Authority furnished 29,561 acre feet or 47.5 percent of the water used for agricultural purposes.

Storage Facilities

The Authority has the right to store up to 20,000 acre feet of water in San Vicente Reservoir under an agreement entered into in 1954. Water is stored by the Authority only on written application by an agency. The reservoir is located at the southern terminus of the First Aqueduct. Delivery of stored water to an agency is accomplished by diverting the requested flow to the agency from the current flow of the aqueduct and simultaneously transferring an equivalent flow of water to the City of San Diego from Authority stored water in the San Vicente Reservoir to compensate for the in lieu water diverted to the agency.

*Blow-off—San Dieguito River
Typical Access Structure
Typical Vent Structure*

the Metropolitan Water District. The samples are analyzed in the laboratory of the District at La Verne, California. The results of the analyses are given in Table 12. The total hardness of water, as shown in this table, reached a minimum of 296 p.p.m. in September of 1958 and a maximum of 317 p.p.m. in June of 1959.

Temperature readings of the flow in the San Diego Aqueduct were taken frequently, showing a variation from a high of 82° in August of 1958 to a low of 52° in December. During the warm summer months chlorination of the flow at Lilac Station consisted of massive doses, approximately 200 to 300 pounds of chlorine injected twice weekly for short periods.

Allocation of Water Among Member Agencies

From July 1, 1958 to March 15, 1959 the demands for water, including storage requests, were considerably less than the capacity of the First Aqueduct, and during this period water was delivered on the basis of need. On March 15, 1959 the City of San Diego demanded delivery of its full allocation. The combined demands of all the agencies exceeded the Authority's ability to deliver from the current flow of the aqueduct, and deliveries by allocation (as set forth in the Authority Act) were initiated.

Under the Authority Act, each agency has a preferential right to purchase a proportionate part of Authority water equal to the proportion which the taxes and related sums (not including payments for water paid to the Authority) bear to all taxes and related sums paid by all agencies. In determining the preferential right of an agency, the outstanding balance of the total amount which an agency has contracted to pay as an annexation charge is included. The percentage right of each agency as of June 30, 1959 is shown in Table 13, together with the basic flow which would be available to each agency, with a capacity flow in the First Aqueduct assumed at 196 cubic feet per second. The City of San Diego, which constitutes 24.13 percent of the Authority area, has the highest percentage right to purchase water, equivalent to 67.57 percent of the Authority flow.

OPERATION AND MAINTENANCE

The Authority continues to center its maintenance and field operational activities at its headquarters in Escondido, California. The maintenance superintendent resides at this location, where he is on

call at all times should there be necessity of his presence during an emergency.

With a crew of 8 men, the superintendent services and maintains in first-class condition the 66 miles of pipeline on the First San Diego Aqueduct and Branch Lines comprising the Authority system. The pipe ranges from 14 to 72 inches in diameter. With the completion of Section One of the Second Aqueduct and its acceptance on March 25, 1959, the work of the maintenance crew was expanded to include an additional 10.6 miles of pipeline. The work will continue to increase as the remaining three sections of the Second Aqueduct are completed and placed in service. In addition to operation and maintenance of the aqueduct system, the crew installed a number of new service connections on the First and Second Aqueducts during the summer months when maintenance activity was at a minimum.

Patrolling and Inspection

A continuous patrol of the aqueduct is maintained, resulting in all sections of the system being inspected at least twice weekly. Open vent structures, of which there are 19 on the First Aqueduct and one on the completed section of the Second Aqueduct, are inspected regularly, at which time the water levels are noted and recorded. Any change from normal is carefully noted and analyzed to determine if the change might be due to bacterial growth in the pipe. In addition, all structures containing air valves are inspected frequently for proper functioning. Twice annually the entire length of the aqueduct is patrolled, with those sections inaccessible by car being traversed on foot to locate any leaks which might have escaped detection during routine patrol.

Delivery of Water

Water deliveries are made and changed at the request of an agency. Authority Ordinance No. 33 requires that 18 hours' notice be given prior to a change by the agency. Because of the heavy demand for water to be placed in storage this rule has not been enforced, with the result that deliveries have been made according to agency request but changes have been kept to a minimum.

There is a total of 18 structures housing 24 service connections on the First Aqueduct and the two Branch Lines, which require maintenance, operation and inspection of meters, with weekly changing of meter charts on which the flow during the week is recorded. Shutoff valves and control valves at these stations are greased monthly.



Maintenance of the Aqueduct System

All indications of corrosion observed by the patrolmen during routine patrol are immediately reported to the superintendent. Steps are then taken to correct and prevent further damage. Seepage through walls into low-lying structures is a common cause of corrosion. The structures require frequent pumping to keep them reasonably dry.

The patrol roads, of which there are 40 miles maintained by the Authority for access to the aqueduct system, require constant attention during the winter months to guard against washouts. During the winter of 1958-59 the very light rainfall resulted in a minimum of effort to keep them in good condition. A new Allis-Chalmers Motor Grader with automatic controls was purchased during the year, resulting in much faster maintenance than was possible with the old grader which was operated manually and purchased in 1948. Upon completion of the Second Aqueduct, road maintenance problems will be substantially increased.

Prevention of erosion on the First Aqueduct right of way has been a constant battle since operation began in 1947. However, the right of way has now acquired

*Second Aqueduct
Construction Activities*

a growth of grass and weeds, and it has stabilized itself with erosion occurring only on steeper sections during heavy rainfall. The Second Aqueduct right of way is mainly bare, except where some attempt has been made to plant grass and ice plant on the steeper slopes. Maintenance of the Second Aqueduct line is going to be particularly heavy for the first few years.

Maintenance of Headquarters

The buildings located at 660 West Fifth Avenue, Escondido, California, were given a coat of paint during the year, and the areas between the buildings were paved. A small one-room addition was made to the superintendent's residence.

Maintenance of Motor Vehicles

The maintenance shop at Escondido is well equipped for repairing Authority motor vehicles, of which there are 49. The Authority employs only one full-time mechanic, who, with occasional help recruited from the regular maintenance crew, services all equipment.

PUBLIC RELATIONS

The Authority continues to enjoy good relationship with local and county newspaper publishers. Since the need for additional water is of prime importance throughout the entire county, construction of the \$35,000,000 Second San Diego Aqueduct has been the subject of much interest. Local publishers have shown a keen interest in construction activities of the Second Aqueduct, as well as all water news of the Authority. A large number of well-written articles, together with illustrating pictures have been published throughout the year.

Members of the Board of Directors and Authority staff appeared at several service clubs and similar civic organizations to explain the Authority Act, under which the Authority operates, and the aqueduct system.

The Authority joined with the Chamber of Commerce and the City of San Diego in conducting an air and bus tour of the county for a group of California Senators and prominent officials to impress upon them the need for additional water—especially northern California water—in the not too distant future.



Laying First Pipe in Lake Murray Crossing

Frank Lawler, Asst. Design Engineer; John McCoy, Project Construction Engineer; James Larney, Project Design Engineer; Fred Heilbron, Chairman of Board of Directors; R. S. Holmgren, General Manager and Chief Engineer; Paul Shaw, Superintendent of Construction, E. A. Irish Construction Company; Robert Wilken, Division Engineer.

SECOND SAN DIEGO AQUEDUCT PROJECT

Excellent progress has been made toward construction of the Second San Diego Aqueduct, which, barring any unforeseen complications, will be completed by late 1960. This project consists of 94 miles of canal, steel and reinforced concrete pipe, designed to divert water from the Metropolitan Water District's Colorado River Aqueduct at San Jacinto into the Authority system six miles south of Riverside-San Diego County line. The pipeline portion of the aqueduct has a capacity of 250 feet per second. The District, of which the Authority is a constituent member, is constructing the northerly 35 miles of the aqueduct to a major delivery point six miles south of the county line. The cost of the Metropolitan section is estimated to be \$22,000,000. The Authority's portion totals 59 miles in length and generally

SECOND SAN DIEGO AQUEDUCT

parallels the First San Diego Aqueduct at a distance of approximately six miles to the west.

Engineering

Construction and design offices for the aqueduct project continue to be located at Authority headquarters in Escondido, with a construction division office located at La Mesa, California. Field engineering and inspection forces are Authority personnel, headquartered at Escondido and La Mesa, respectively, under the overall supervision of Mr. John D. McCoy, Project Construction Engineer. The work performed under Mr. McCoy and the two Division Engineers, Messrs. Lee D. Purdin and Robert H. Wilken, includes surveys of pipeline location and rights of way, preparation of contract specifications, layout and inspection of actual construction operations by the contractors.

On April 17, 1959 Mr. McCoy resigned from the Authority to take a position with the U. S. Government in Formosa to develop water for the Nationalist Chinese Government. Since specifications for the entire project had been completed and the contracts for three of the four sections of the aqueduct had been awarded to contractors, no successor was employed to fill the position. The two division engineers continue to supervise the field activities in their respective divisions and report directly to the Chief Engineer.

Design and construction drawings for the Second Aqueduct project were prepared by a special engineering staff under the direct supervision of Mr. James P. Larney, Design Engineer. This group also checked the shop drawings of pipe, materials and reinforcement details being fabricated for the project.

As of July 1, 1959 there remains only the design and preparation of drawings for the construction of a chlorination station in Rainbow Pass, where the two barrels of the First Aqueduct and the single-barrel Second Aqueduct can be serviced from one chlorination station. So far as is practical all of the chlorination equipment now installed at Lilac Station, which can only chlorinate the flows in the First Aqueduct, will be utilized in the Rainbow Chlorination Station.

Construction

For construction purposes the Second Aqueduct has been divided into four sections. As of June 30, 1959 all four contracts had been awarded to contractors.



Section 1—Specification 201

This section, totaling 10.6 miles, extends from the Metropolitan Water District major delivery point in northern San Diego County to a point designated Twin Oaks Vent, located on the divide between San Luis Rey River and Escondido Creek, about five miles north of the community of San Marcos. The pipeline, consisting of steel pipe with cement mortar coating and lining, is 72 and 75 inches in diameter. Proposals for construction of this section were received from eight contractors (see Twelfth Annual Report, page 30 for individual bids), with Young and Anderson Co. being the low bidder at \$6,366,304. The contract was awarded on November 21, 1957.

Crossing the San Luis Rey River, where the pipe was laid approximately 25 feet below the river bottom, proved to be the most difficult portion of this section to construct. It was necessary to sink nine wells from 60 to 90 feet deep and pump water from the sands before the pipe could be laid in the dry. On March 25, 1959 Section One of the Second San Diego Aqueduct was completed, and on March 26, 1959 a notice of completion was filed with the county recorder.

Final cost for construction of Section One was \$6,373,874.41.

Aqueduct Pipe and Encasement Across San Diego River



only \$7,570.41 above the estimated cost of \$6,366,304, based on bid prices and estimated quantities. The close agreement between the Authority's estimates and the contractor's actual final payment is the result of good engineering. Careful estimates of the required work, prepared from complete construction drawings which were accurately laid out, resulted in no unforeseen contingencies occurring during actual construction.

Upon completion of Section One, the pipeline was tested under a pressure head slightly greater than that which could exist under operating conditions with maximum flow. The specifications permit a leakage of 15 gallons per mile per inch of diameter for a 24-hour period, equal to 1,080 and 1,125 gallons per mile per day for the 72 and 75-inch pipe, respectively. The contract was divided into five sections for test purposes. The results are shown in the following tabulation:

Test Section	Allowable Leakage	Actual Leakage	Percent of Allowable
Section 1	1,817 gal/day	8 gal/day	0.4%
Section 2	1,963 gal/day	0 gal/day	0%
Section 3	2,631 gal/day	53 gal/day	2.0%
Section 4	2,935 gal/day	0 gal/day	0%
Section 5	2,460 gal/day	0 gal/day	0%

Section 2—Specification 202

This section extends from the southern terminus of Section One at Twin Oaks Vent southerly to Black Mountain Vent about 4½ miles south of the aqueduct's San Dieguito River Crossing, a total distance of 18.2 miles.

The specifications for this section call for pipe sizes 66, 69, 72 and 75 inches in diameter. On April 11, 1958 proposals for construction of Section 2 were received from 8 bidders (see 12th Annual Report, page 31), with Young and Anderson Co. again being the low bidder of \$8,766,694, on the basis of furnishing steel pipe cement mortar lined and coated, with rubber gasket joints, except at designated locations where welded joints are required.

As of June 30, 1959 there remains only 4,200 feet of pipe to be laid in the vicinity of Escondido Creek and 20,900 feet at the southerly end of the section, about 26 percent of pipe remaining to be laid to complete this section. Final cleanup work has been completed to the top of the hill on the south side of San Marcos Valley. Total value of contract work accomplished to June 25, 1959 totals \$5,809,348, equal to 66.3 percent of the total contract price of \$8,766,694.

The completed pipeline to San Marcos Vent was tested in two sections. The tests were particularly interesting, inasmuch as these sections include primarily pipe with rubber gasket joints. The specifications under which this section is being constructed permit a leakage of 50 gallons per mile per inch of diameter for a 24-hour period, equal to 3,300, 3,450, 3,600 and 3,750 gallons per mile per day for the 66, 69, 72 and 75-inch pipe, respectively. The results of the tests, consisting of water in the pipe at slightly greater head than under operation at maximum capacity, gave the following results:

Test Section	Allowable Leakage	Actual Leakage	Percent of Allowable
Section 1	8,544 gal/day	267 gal/day	3.1%
Section 2-A	8,176 gal/day	150 gal/day	1.8%
Section 2-B	9,974 gal/day	300 gal/day	3.0%

Section 3—Specification 203

The portion of the Second Aqueduct included in this section extends from Black Mountain Vent to a point a short distance southerly of the aqueduct's crossing of El Cajon Boulevard in La Mesa. The total length of aqueduct included in this contract is 16.8 miles and consists of 66, 69 and 72-inch pipe.

On November 7, 1958 proposals for the construction of this section were received from the following contractors:

Contractor	Amount Bid
E. A. Irish Contractor	\$6,562,895
Vido Artukovich, Inc., and H. C. Smith Construction Co., a joint venture	7,041,342
Ukropina, Polich and Kral Construction Co.	7,079,610
Young and Anderson Co.	7,099,464
Morrison-Knudsen Company, Inc.; Macco Corporation; and F. E. Young Construction Company, a joint venture	7,178,016
Foster-Marsch Corporation	7,329,722
Webb & White, and R. B. Potashnich Construction Company	7,524,210

All bids were on the basis of furnishing prestressed concrete pipe.

On November 13, 1959 the contract for this section was awarded by the Board of Directors to the E. A. Irish Construction Company at unit bid prices totaling \$6,562,895 on estimated quantities, with the contractor proposing to furnish prestressed concrete pipe. The 66-inch pipe is to be fabricated and furnished to the contractor by the

American Pipe and Construction Company of Southgate, California, and the 69-inch pipe will be furnished by the United Concrete Pipe Corporation of Baldwin Park, California. As of June 30, 1959, no portion of this section had been tested. Construction has been considerably slowed down by the tunneling of Highway 80, Fletcher Parkway and El Cajon Boulevard. The completion date is June 30, 1960. As of June 30, 1959 the total value of contract work accomplished is \$1,959,832, equal to 30 percent of the total contract price of \$6,562,895.

Section 4—Specification 204

This section extends southerly from the end of Section 3 at El Cajon Boulevard to the terminal structure near the westerly end of the dam at Otay Reservoir. The total length of pipeline to be laid on this section is 13.4 miles, consisting of 66 and 69-inch diameter pipe.

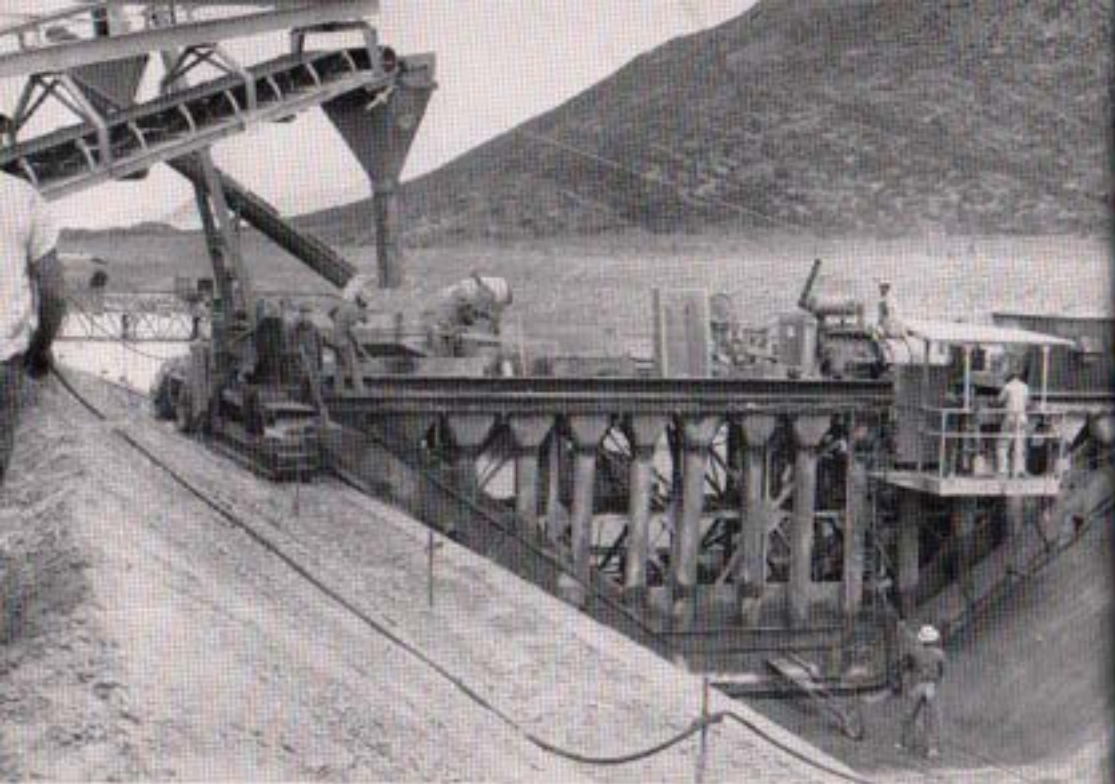
On May 8, 1959 proposals for construction of the fourth and last section of the Second San Diego Aqueduct were received from the following contractors:

Contractor	Amount Bid
Foster-Marsch Corporation	\$6,213,544
Morrison-Knudsen Company, Inc.; Macco Corp.; and F. E. Young Construction Co., a joint venture	6,279,928
A. Teichert & Son, Inc.	6,299,858
Young and Anderson Co.	6,306,783
Vinnel Company, Inc., and Ukropina, Polich and Kral Construction Co., a joint venture	6,342,347
Vinnel Company, Inc., and Ukropina, Polich and Kral Construction Co., a joint venture	6,643,975 (*)
Engineers Limited Pipeline Co., and Stolte, Inc., a joint venture	6,704,222
Matt J. Zaich Construction Co.	6,884,089

All bids were on the basis of furnishing prestressed concrete pipe.

(*) Vinnel-Ukropina, Polich and Kral submitted a bid for furnishing steel pipe.

On May 14, 1959 the Board of Directors awarded the contract to Foster-Marsch Corporation at a unit bid price totaling \$6,213,544 on the estimated quantities. As of June 30, 1959 no work on this section had been done by the contractor. However, excavation and pipelaying are expected to begin early in August. The American Pipe and Construction Company will furnish the 66-inch pipe to the contractor, and



Placing Concrete Lining on Metropolitan Water District Canal Section of Second Aqueduct

SECOND SAN DIEGO AQUEDUCT

the United Concrete Pipe Corporation will furnish the 69-inch pipe. About equal amounts of each will be required. The completion date is set for November 30, 1960, after which the entire Second San Diego Aqueduct will be placed in operation.

Chlorination Station—First and Second Aqueducts

The Authority proposes to construct a new chlorination station in the vicinity of Rainbow Pass, from which flow in either or all three pipelines of the First and Second Aqueducts can be chlorinated. Preliminary studies are being made, and construction drawings will be ready for bidding the latter part of 1959.

Rights of Way

A right of way across 290 parcels of land (including 39 parcels for the Metropolitan Water District section which lies in San Diego County, for which the Authority is obtaining a right of way) will be required for the construction of the 65 miles of the Second San Diego Aqueduct in San Diego County.

A right of way across Camp Elliott was given to the Authority by the Federal Government. Wherever the Second Aqueduct crosses water utilities property, the land has been donated to the Authority. As of June 30, 1959, all rights of way for the aqueduct line have been obtained with the exception of 24 parcels, held by 19 ownerships. Condemnation proceedings for the acquisition of these unacquired parcels is in progress, as described in the legal section of this report.

Metropolitan Section of Second San Diego Aqueduct

The Metropolitan Water District has awarded three contracts for the construction of its portion of the Second Aqueduct, extending from the Colorado River Aqueduct near San Jacinto to its major delivery point six miles inside San Diego County, a total distance of 35 miles.

The contract for the most northerly 16 miles of Metropolitan's portion of the Second San Diego Aqueduct includes that part of the aqueduct extending from a takeoff point on the Colorado River Aqueduct Casa Loma Canal Section 4.4 miles west of the west portal of San Jacinto Tunnel and extends southerly to Auld Valley. This section consists of open canal, except for siphons under roads and water courses.

The canal will have a capacity of 1,000 cubic feet per second, sufficient to deliver the estimated ultimate water requirements of San

Diego County. The contract for this portion of the District project was awarded to Winston Brothers Company.

As of June 30, 1959, rough excavation on the San Diego Canal Section is practically complete, and the pouring of concrete lining has begun. It is expected that construction of the Casa Loma Siphon and the Canal Section of the San Diego Aqueduct will be completed by March 31, 1960.

The construction of the District's portion of the Second San Diego Aqueduct, extending from the end of the Canal Section near Auld Valley in Riverside County to the San Diego County line, was awarded to Ukropina-Polich and Kral Construction Company. This contract was completed June 30, 1959.

Included in the U-P-K contract were two crossconnections to be located in the Rainbow Pass area. The southerly crossconnection will permit delivery of water from the First Aqueduct to the Second Aqueduct, and the northerly crossconnection will allow diversion from the Second Aqueduct to the First Aqueduct. Should an emergency occur or a shutdown be required for maintenance purposes, these two crossconnections will permit the isolation of the upper or lower portion of each aqueduct.

The contract for the construction of the Metropolitan aqueduct lying within San Diego County was awarded to Vido Artukovich and Son, Inc., for a total distance of 5.9 miles. This section of the aqueduct was completed in June of 1959.

SERVICE CONNECTIONS ON AUTHORITY SYSTEM

The following nine service connections were designed and the construction drawings were prepared by the San Diego office engineering staff under the supervision of Assistant Chief Engineer Allen H. Jones. The installations were made by the maintenance crew under the supervision of Maintenance Superintendent Joseph E. Lester.

Fallbrook No. 4 Service Connection

This outlet is located at Station 2101+50 on the Second Aqueduct about two miles north of San Luis Rey River. Water will be delivered into a new pipeline installed by the Fallbrook District, which connects the Second Aqueduct to the District's distribution system in its southerly area, where difficulty has been experienced with the maintenance of pressure when deliveries were made from the First Aqueduct.

Fallbrook District is the first member agency of the Authority to receive water from the Second Aqueduct.

Water deliveries will be metered by a B.I.F. 18" x 10" short venturi tube and a Type MDUAX meter instrument with a capacity of 22 c.f.s. The rate of flow to the District will be controlled and maintained by a Nordstrom Plug Valve and an automatic operating unit, manufactured by General Controls Corporation. The equipment has been installed in a reinforced concrete and block masonry structure which will permit easy access for maintenance and operation. As of June 30, 1959 the station was complete, and water is being delivered from the Second Aqueduct to the District. The water being delivered was diverted from the First Aqueduct through the crossconnection at Rainbow.

Rainbow No. 3 Service Connection

This service connection is located at Station 2435+62 on the Second Aqueduct about one-half mile south of the aqueduct crossing of Moosa Canyon Road. Water will be delivered into the south reservoir of the Rainbow system, which will be connected to the northerly system through a pipeline in Moosa Canyon now under construction. Deliveries will be metered by a 18" x 10" B.I.F. short venturi tube and a Type MDUAX meter instrument having a capacity of 22 c.f.s. Deliveries will be controlled by a B.I.F. Butterfly Valve operated by a General Controls operating unit. Equipment has been installed in a reinforced concrete and block masonry structure. As of June 30, 1959 this connection was complete with the exception of some minor electrical wiring.

Bueno No. 3 Service Connection

This connection is located at Station 2748+00 on the Second Aqueduct near Pechstein Reservoir of the Vista Irrigation District. The meter, valves and a part of the piping for this connection were transferred from Bueno No. 1 Service Connection on the First Aqueduct. The meter is a 24" x 12" B.I.F. standard venturi tube and a Type MDUAX meter instrument having a capacity of 30 c.f.s. A 14-inch Nordstrom Plug Type Valve, operated by a General Controls operating unit, will control the flow to the District. The equipment is housed in a reinforced concrete and block masonry building. As of June 30, 1959 the structure was completed and the valves were installed. All piping and equipment are at the site ready for installation.

Carlsbad No. 1 Service Connection

This connection is located at Station 2965+22 on the Second Aqueduct, near the intersection of Santa Fe and Encinitas Roads in San Marcos Valley. The connection will deliver water into a new transmission line to be constructed by the District, connecting the service outlet with its distribution reservoir south of Santa Fe Road.

Deliveries will be metered by a 24" x 13.5" B.I.F. short venturi tube and Type MDUAX instrument having a capacity of 40 c.f.s. Deliveries to the District will be controlled by a 24-inch Nordstrom Plug Valve and a General Controls automatic operating unit, arranged to give constant delivery of the amount required by the agency. Equipment is housed in two structures of reinforced concrete and block masonry to a height of four feet above ground to conform with the requirements of the Escondido Union High School Board of Trustees, who placed this requirement on the building when donating the area to the Authority for aqueduct purposes.

This is the first service connection directly serving the Carlsbad District, and in accordance with its policy the Authority is paying a portion of the cost equivalent to the cost of a 16 c.f.s. connection, the size to which the District is entitled at Authority expense. As of June 30, 1959 the installation had been completed and it was ready to begin service except for some minor electrical wiring.

Oceanside No. 2 Service Connection

This connection is located at Station 2502+50 about one-half mile south of Gopher Canyon. The City has requested and provided funds for the installation of a valve and protective structure at this time to permit completion of the service connection at some future time without requiring that the aqueduct be shut down. The City of Oceanside is studying its water requirements in the San Luis Rey Valley area which was recently annexed. The study indicates that a pipeline bringing water to its system from the Second Aqueduct will be required sometime before 1964. As of June 30, 1959 the valve had been installed but the structure had not been completed.

Bueno No. 1 Service Connection

This connection, located on the First Aqueduct at Rincon Avenue in Escondido, was reduced in size by the removal of the original 30 c.f.s. meter, which was installed at this location to deliver water directly into the Vista Flume for use of the Vista Irrigation District. Since the hydraulic gradient in the flume was considerably lower than that

in the aqueduct, a substantial loss in head occurred when deliveries were made. The possibility of utilizing this lost head at Bueno No. 3 Service Connection on the Second Aqueduct and relieving the Vista Flume to provide capacity for Lake Henshaw water indicated that the 30 c.f.s. meter should be removed from Bueno No. 1 and installed at Bueno No. 3 Service Connection. A smaller meter, removed from the abandoned Fallbrook No. 2 Service Connection, was installed at this location for emergency use. The meter installed consists of a B.I.F. 12" x 6" standard venturi tube and Type MDUAX instrument having a capacity of 10 c.f.s. Deliveries are controlled manually by a 12" Nordstrom Plug Valve. As of June 30, 1959 revamping of this station had been completed, except for miscellaneous work and the final cleanup.

Fallbrook No. 2 Service Connection

This connection was originally installed on the Fallbrook-Oceanside Branch Line near Fallbrook, California, in 1949 in order to deliver water to the District's Red Mountain Reservoir. Since the Fallbrook Public Utility District no longer planned to utilize this service connection, after completion of a new supply line from the First Aqueduct at Rainbow to the Red

Typical Service Connection Structures



Mountain Reservoir on June 30, 1956, the District informed the Authority by Resolution in May of 1959 that service would no longer be required at this location, consenting to the removal of the station. The meter instrument, tube and valves, and some of the small accessories were removed and installed in the Bueno No. 1 Service Connection structure to replace the meter removed from that station.

In accordance with a policy adopted by the Authority Board of Directors at its meeting of May 14, 1959, the Fallbrook District will receive a credit equal to the original cost of the equipment less reasonable depreciation, less the cost of removal.

Rio No. 1 Service Connection

This connection is located in the control station at Lakeside on the La Mesa-Sweetwater Branch, installed during the original construction of this branch line to deliver water to the Lakeside Irrigation District, one of the original member agencies of the Authority, now included within the area of the Rio San Diego Municipal Water District. The original meter installation included a Hersey 4" x 1" Model CT compound meter.

The original meter was removed from this station and installed at Rio No. 3 Service Connection, and the meter and usable piping from the Rio No. 3 Service Connection on the north bank of the San Diego River were installed at this location, consisting of a 10" x 5.25" B.I.F. short venturi tube and a Type MDUAX instrument having a capacity of 6 c.f.s. Water deliveries are controlled manually by a 10" Nordstrom Plug Valve. The work at this station was completed and placed in operation at the close of the year.

Rio No. 3 Service Connection

This connection is located on the La Mesa-Sweetwater Branch Line directly north of the San Diego River, and it was installed in 1957 to serve the Lakeside Mutual Farms Water Company, lying within the Rio District. The District owns wells in the valley floor and obtains its principal water supply from this source. Since it was evident that only small quantities of water would be required from the Authority for sometime, the venturi meter was removed and replaced by the Hersey Meter from Rio No. 1 Service Connection. By June 30, 1959 the work of exchanging the meters was complete and the station was ready for delivery of water.

Preliminary studies have been completed for several additional service connections, including the installation of a 90 c.f.s. service connection to serve the proposed City of San Diego Miramar Treat-

ment Plant, located adjacent to the aqueduct immediately east of Miramar; the proposed service connection to the City of San Diego Alvarado pipeline, which will permit better distribution of flows between the First and Second Aqueducts; and a 50 c.f.s. service connection to serve the California Water and Telephone Company's proposed treatment plant, to be located adjacent to the aqueduct directly north of the Sweetwater Dam.

LEGAL AND LEGISLATIVE

While the Authority has never been forced to engage in serious litigation, it is the function of its General Counsel to advise its employees, officers and directors in the daily operations of the organization in such manner that the occasion for such litigation shall not arise from errors of their commission or omission. As the area and activities of the Authority increase, so does the responsibility of the General Counsel, resulting in increasing demands upon his time and professional services.

The counsel prepares all resolutions and ordinances adopted by the Board of Directors, examines and approves all contracts, leases, property acquisition documents, official bonds, insurance policies and any matters which create or affect any legal relations. To be properly efficient in this work, it is essential that the counsel work closely with all departments and officials of the Authority, the committees of its board, and with the board itself. For these purposes, the counsel attends all board and committee meetings and countless conferences with staff and board members.

Annexations

In addition to the expansion of the ordinary functions of the Authority, annexations (both of separate members and of additional areas to existing members) are growing in complexity. Annexation of territory as a part of the Authority involves the creation of legal relations with a variety of different types of public agencies, each having its own legal technicalities in its annexation procedure. As annexation to the Authority is legally effective only to the extent that the agencies' proceedings are legally correct, the Authority's counsel must be able to pass upon the adequacy of both the formation proceedings and annexation proceedings of each type of public agency represented in its membership. These include cities, irrigation districts, public utility districts and municipal water districts, each organized under a different enabling act and having different legal requirements for formation and for annexation of territory. The type of annexation, for example in-



LEGAL AND LEGISLATIVE

habited and uninhabited territory, introduces further changes in procedure.

Because of the necessity of making detailed studies of the proceedings followed by proponents of proposed annexations and because of the unfamiliarity with the Authority's requirements on the part of legal counsel for some of the agencies, it is necessary in many instances for the Authority's counsel to supervise each step taken by the applicants. While no new members were added during the year, substantial areas were added to Fallbrook, San Diego, Oceanside, Ramona and Helix. Areas were also exchanged by Helix and Rio and by South Bay and Otay. New proceedings under way but not completed include the proposed Olivenhain and East County Districts, additions to Poway, Rincon, Valley Center, San Dieguito, Santa Fe, Helix and Otay.

Miscellaneous Activities
on Second Aqueduct



Second Aqueduct

While the board authorized employment of special counsel to conduct the condemnation proceedings for the Second Aqueduct rights of way, many legal duties remained in supervising the acquisitions by purchase. These included frequent conferences with and counselling of the right-of-way staff, examining contracts and easement documents resulting from their efforts, clearing payments for purchases and court deposits and the like. Construction contracts, their proper execution, examination of bonds and insurance certificates, (required from contractors), consultations between the staff and contractors and contractors' representatives, all entail considerable responsibility and consume considerable time. Additional bond sales, their proofing, the delivery to the purchasers, the procedure for handling proceeds of sale, all come within the counsel's supervision. During the year, certain of the holders of the new bonds, all of which were issued as bearer obligations, surrendered the bonds to the Authority for registration and re-issue as registered obligations. This required the setting up of the legal mechanics for the change in nature of the securities and conferences with the treasurer and controller to perfect the procedure.

Legislation and State Water Development

The Authority Act was amended during the 1959 spring session to increase to \$90 million the assessed valuation entitling a member agency to an additional Authority director. It is planned to gradually increase the amount so as not to deprive any agency of the number to which it is currently entitled, but prevent the unwarranted increase in number of directors in the future. The bill for this purpose was



handled by the San Diego Legislative delegation with little effort on the part of the Authority.

Attendance on the legislature, presentation of material to legislative committees, consultation with the Authority board and committees, participation in local and statewide committees, all in connection with the promotion of statewide water development, continue to require an overwhelming amount of the counsel's time and effort. The counsel has participated in formulating this program in the belief that its accomplishment is of major importance to the Authority area, and that the method of its accomplishment is of equal importance. As legal problems have been given a prominence not necessarily in proportion to their importance, counsel for the Authority has deemed it to be his duty to be constantly alert to and familiar with the developments so that the board can be informed and its position be made known to those taking the leadership in the program. Gratification resulted from the success of the program in the legislative session ending in June, but that success did not end the continuing obligation to work for its acceptance by the electorate. Much remains to be done before the Authority area is assured of water to meet its requirements, and continued participation in the work by the Authority and its counsel is indicated.

FINANCIAL

The statements contained in Tables 15 to 22, inclusive, summarize the Authority's financial position at June 30, 1959, and the results of its fiscal operations for the year then ended. Continuing the policy of the Board of Directors as described in previous reports, operating requirements have been met primarily from revenues from the sale of water to member agencies. Requirements for contractual payments to the United States Government, and for service and retirement of bonded debt, have been provided from tax levies. Funds for construction of the Second Aqueduct have been provided from sale of \$23,000,000 in general obligation bonds, of the \$35,000,000 authorized by the electorate July 9, 1957.

During 1958-59, operating income amounted to \$1,556,396, while operating costs amounted to \$1,563,092. Non-operating income totaled \$420,936, while depreciation and debt service expense amounted to \$381,614, resulting in net income of \$32,626 from utility operations, compared with \$130,594 for the preceding year. This decrease resulted primarily from the Authority's reduced sales of water as compared with the preceding year.

Cash and marketable securities at June 30, 1959 amounted to \$12,610,275, compared with \$8,252,455 at June 30, 1958. Included in the total were \$11,129,270 in securities of the United States Government, earning an average interest rate of 3.17%. During 1958-59 current assets increased \$248,249, while current liabilities increased \$67,755. Special fund assets decreased \$11,728,426, principally because of expenditures for construction of the Second Aqueduct, while special fund liabilities increased \$2,011,637 as a result of the increase in the unpaid amounts under contracts for Aqueduct construction. Fixed assets increased \$15,748,869, while long-term obligations increased \$13,912,148, reflecting the issuance of additional bonds and expenditures for Aqueduct construction; this resulted in a net increase of \$1,836,720 in the Authority's investment equity in fixed assets. Reserves for debt redemption decreased \$332,741, principally because of the reduction of the amount due from the Metropolitan Water District by its payments to the Authority on the First Aqueduct. Reserves for encumbrances increased \$142,333 on construction contracts. Appropriated surplus decreased \$13,560,144, while unappropriated surplus increased \$190,983. The net overall result for the year was a decrease of \$11,722,848 in the Authority's net reserves and equities.

In summary, the Authority's financial position continues to be sound and strong. Generally, operating requirements are financed from operating revenues. Provision for the orderly retirement of present and projected debt has been established by the Board's long-range policy previously referred to, and by the use of special funds. The Authority's position is further strengthened by the maintenance of necessary and adequate reserves, the investment of which also aids in minimizing tax requirements.

The Authority's accounting system conforms to the basic principles of fund and budgetary accounting normally employed in municipalities, modified to the extent necessary to reflect conditions peculiar to the Authority. Accounts are maintained on the accrual basis; that is, revenues are recorded when earned, and expenditures and/or encumbrances are recorded when incurred. All accounts have been regularly audited by the firm of Everts and Esenoff, Certified Public Accountants, whose certificate is included herein. Every effort has again been made, in this report, to present clearly and comprehensively, the Authority's financial position, the results of its fiscal operations, and to reflect our continued conformity to the highest standards of accounting and reporting as promulgated by the Municipal Finance Officers Association and the National Committee on Governmental Accounting.

SAN DIEGO COUNTY WATER AUTHORITY

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October 5, 1959

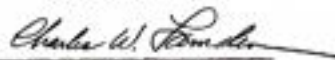
Board of Directors
San Diego County Water Authority
San Diego 3, California

Gentlemen:

We have examined the statement of financial position of the San Diego County Water Authority as of June 30, 1959, and the related statements of income and surplus for the year then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement of financial position and related statements of income and surplus present fairly the financial position of the San Diego County Water Authority at June 30, 1959, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the prior years.

Yours very truly,


For Everts and Esenoff
Certified Public Accountants

MEMBERSHIP IN THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

The Authority receives its entire water supply from the Metropolitan Water District as a member agency of that District, to which it annexed as the fifteenth constituent member December 17, 1946. The act under which the District was organized in 1928 was used as a pattern for the Authority Act, which in many instances is similar to the District Act.

The District is governed by a board of directors, made up of representatives from each of its constituent member agencies. Each agency is entitled to one representative on the Metropolitan board of directors, and an additional director for each \$500 million dollars of assessed valuation.

The Authority is represented on the Metropolitan board of directors by Mr. Fred A. Heilbron, who has represented the Authority for twelve years, since it annexed to the District in 1946, and who is also secretary of the board and a member of the Water Problems and Finance Committees of the District. The second representative is the Authority's General Manager and Chief Engineer, Richard S. Holmgren. Mr. Holmgren has served on the District board six years. He is also chairman of the Engineering and Operations Committee and a member of the Personnel Committee.

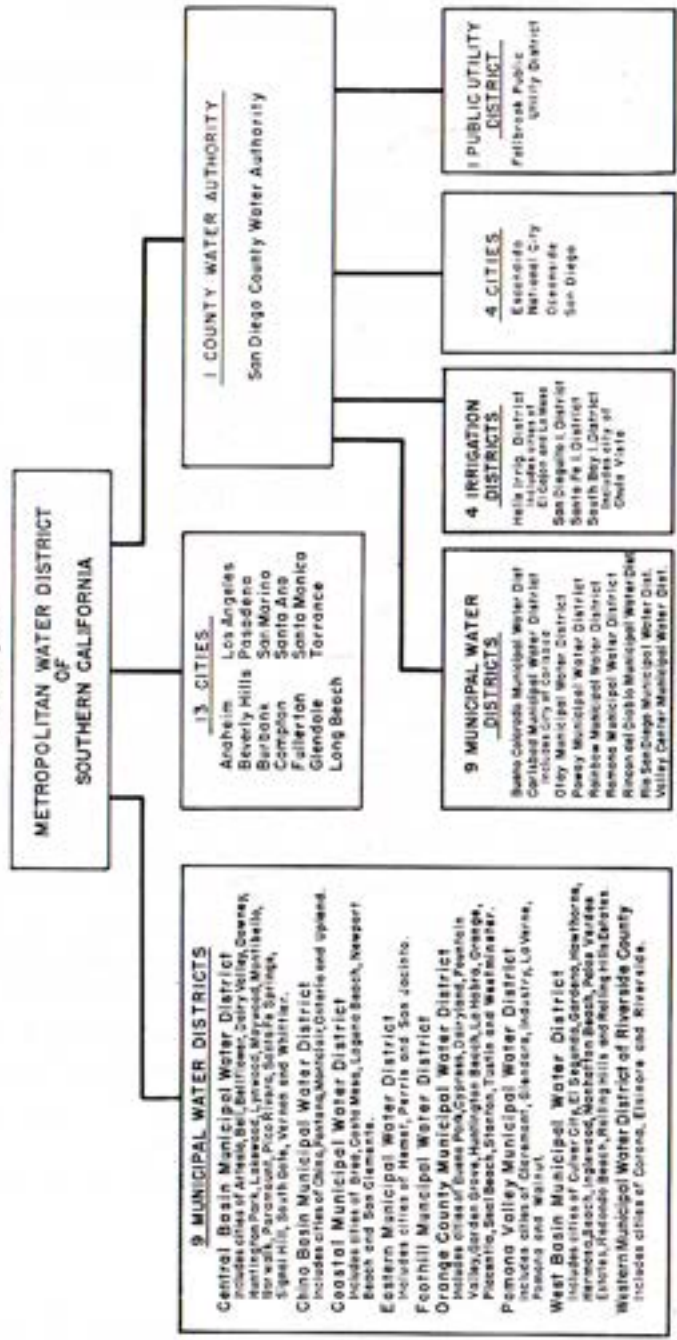
In all actions taken by the board, each agency has one vote for each \$100 million of assessed valuation regardless of the number of representative directors, and the votes must be cast as a block. As of June 30, 1959, the Authority had 112 votes on the board of a total of 1,205 votes, or 9.29 percent of the District board. Under the District Act, no agency can have more than 50 percent of the total votes. Los Angeles, which once had a 50 percent vote, is now entitled to only a 34.84 percent vote. The District is comprised of 23 constituent member agencies, consisting of 13 cities, 9 municipal water districts, and one water authority. Within the District area there are 86 incorporated cities.

Area

On June 30, 1959 the total area within the Metropolitan District

COMPOSITION OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

JUNE 30, 1959



MEMBERSHIP IN THE METROPOLITAN WATER DISTRICT

was 3,325.5 square miles. Of this area, that lying within the Authority totaled 520,853 acres, or 814 square miles, equal to 24.5 percent of the District area. There were no constituent areas annexed to the District during the year. The 128.5 square mile increase resulted from concurrent annexations to member agencies, of which 87 square miles, or 68 percent represents concurrent annexations to the Authority.

Assessed Valuation

The assessed valuation of taxable property within the District for the taxable year 1958-59 was \$12,070,838,070, an increase of \$834,931,560, or 7.4 percent over the previous year. In the same period the assessed valuation of taxable property within the Authority increased to \$1,121,860,510, an increase of \$116,737,870, or 11.6 percent, indicating a slightly greater proportionate increase in valuation in the Authority area than in the Metropolitan Water District as a whole.

Water Supply

The District has contractual rights to 1,212,000 acre feet of water per year in the Colorado River, and storage capacity behind Hoover Dam to equalize the river flow to make this quantity available. Water required by the District is released at Hoover Dam through the power plant, where the District has contracted with the United States of America for 36 percent of the power produced for use in its pumping stations located along the aqueduct. Water released flows downstream to Lake Havasu, created by Parker Dam, where it is diverted into the Colorado River Aqueduct. In this aqueduct, the water is raised by five pumping stations a total of 1,357 feet to a maximum elevation of 1,807 feet, from which it flows to the delivery points of all member agencies by gravity.

The District delivers water to the Authority's First Aqueduct on the north bank of the San Luis Rey River, a distance of 255 miles from the Colorado River at a hydraulic gradient of 1,200 feet elevation.

The District is actively engaged in an expansion program which will bring the Colorado River Aqueduct up to its full capacity and increase the capacity of existing feeder lines, including the San Diego

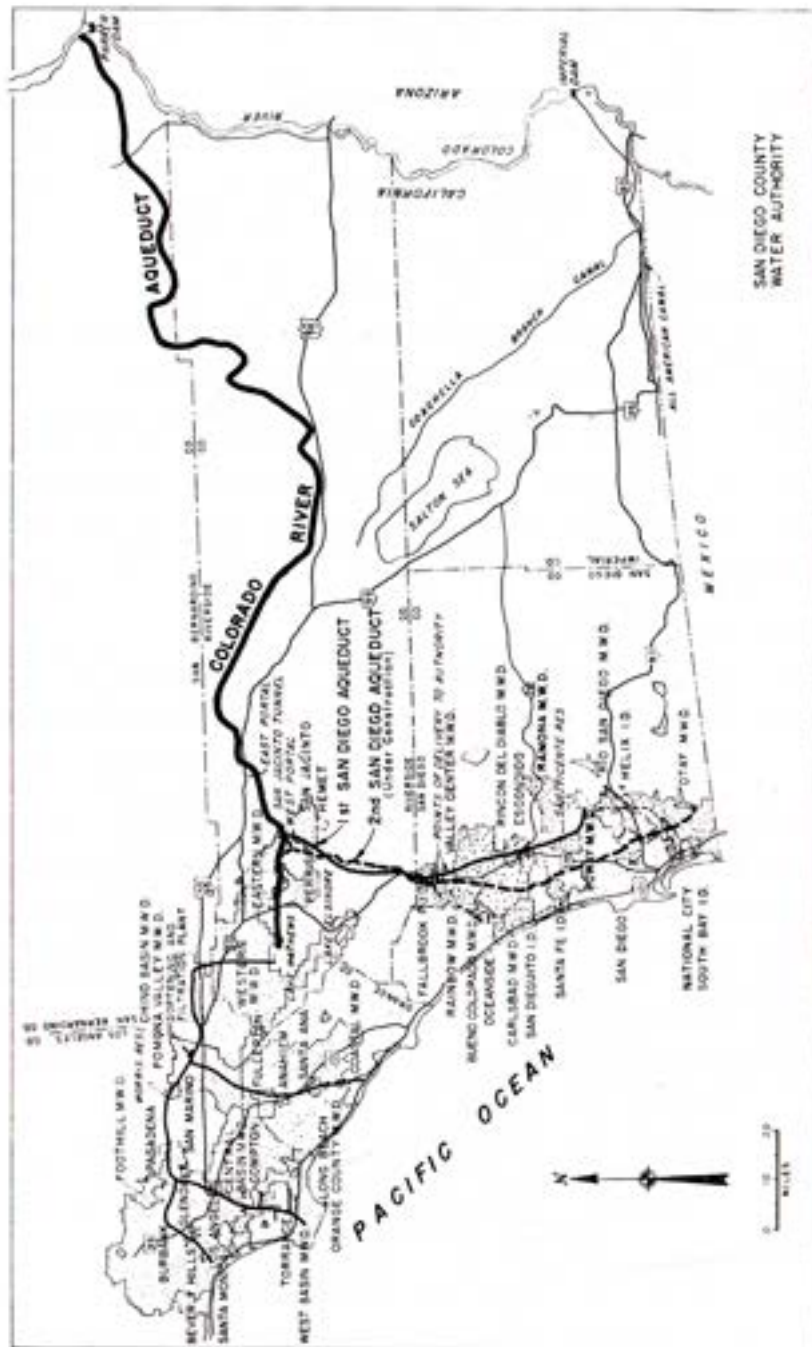


Figure E. Water Systems of Metropolitan Water District and San Diego County Water Authority.

Feeder by the construction of the Second San Diego Aqueduct, to a capacity capable of delivering an additional 250 c.f.s. to the Authority. The work under the expansion program is expected to be completed in 1960. Upon completion, the District will be able to deliver about 450 c.f.s. to the Authority through the combined First and Second Aqueducts, or approximately 320,000 acre feet of water if operated continually throughout the year.

Water Sales

A total of 102,779 acre feet of water was delivered by the District to the Authority during 1958-59, as shown in Table 26, a decrease of 41,236 acre feet from that delivered in 1957-58. Deliveries to the Authority represented 19.5 percent of a total of 526,602 acre feet of treated and untreated water to District member agencies in 1958-59.

District Tax

A tax was levied on all taxable property within the District at a rate of 18 cents per \$100 of assessed valuation, the same rate as that levied by the District for the previous year. Tax rates as levied by the District since its first levy in 1929-30 are shown in Table 27. The regular tax levy in 1958-59 on property within the Authority totaled \$2,662,397, or 9.6 percent of the total tax levy of \$27,616,727.

Special taxes were levied against those areas which have annexed to the District since its organization and who have not paid their annexation charges. The total amount of annexation charges by the District on the area within the Authority as of June 30, 1959 is \$18,625,000, of which \$6,151,000 has been paid to June 30, 1959, leaving \$12,474,000 still to be paid. Payments to date and the amounts of outstanding indebtedness for each agency in the Authority are shown in Table 24.

Water Rate

A new water rate became effective July 1, 1958, under which the price of raw and treated water was increased by \$3.00, to \$15.00 and \$25.00 per acre foot, respectively, except for such water as is used for agricultural purposes or for replenishing water of underground storage,

SAN DIEGO COUNTY WATER AUTHORITY

where the old rates of \$12.00 and \$22.00 per acre foot were retained. The Authority receives only untreated water.

The District's total revenue from the sale of water in 1958-59 was \$11,150,279, of which \$2,842,071 was received for softening and filtering. Of the remainder received by the District for raw water prior to filtering, totaling \$8,308,208, the Authority paid a total of \$1,468,302, or 17.7 percent.

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SAN DIEGO COUNTY WATER AUTHORITY

TABLE 1
AREA—AUTHORITY MEMBER AGENCIES

Member Agencies	Area Within Authority			Percent of total Authority area 6/30/59
	As of 6/30/58	Changes during year	As of 6/30/59	
	acres	acres	acres	
Bueno Colorado M.W.D.	50,540	0	(3) 50,540	9.70
Carlsbad M.W.D.	20,811	0	(4) 20,811	4.00
In City of Carlsbad	(4,780)	(0)	(4,780)	(0.92)
Escondido, City of	2,252	+883	3,135	0.60
Fallbrook Public Utility Dist.	8,192	+7,277	15,469	2.97
Helix Irrigation District (2)	30,499	+316	(6) 30,815	5.92
In City of El Cajon	(5,525)	(+642)	(6,167)	(1.18)
In City of La Mesa	(4,100)	(+293)	(4,393)	(0.84)
National City, City of	4,724	+31	4,755	0.91
Oceanside, City of	9,880	+6,619	16,499	3.17
Otay M.W.D.	50,657	(1) -713	(7) 49,944	9.59
Poway M.W.D.	10,800	0	10,800	2.07
Rainbow M.W.D.	33,900	(9) +6,140	(9) 40,040	7.69
Ramona M.W.D.	20,600	+9,300	29,900	5.74
Rincon del Diablo M.W.D.	22,080	(1) -883	(5) 21,197	4.07
Rio San Diego M.W.D.	18,700	+5	18,705	3.59
San Diego, City of	98,993	+26,670	125,663	24.13
San Dieguito Irrigation Dist.	3,996	0	3,996	0.77
Santa Fe Irrigation Dist.	10,082	0	(8) 10,082	1.93
South Bay Irrigation Dist.	15,447	(1) -105	(10) 15,342	2.94
In City of Chula Vista	(4,280)	(+1,227)	(5,507)	(1.06)
Valley Center M.W.D.	53,160	0	53,160	10.21
Total Authority Area (2)	465,313	55,540	520,853	100.00
San Diego County			2,725,100	

- (1) Annexed by an adjacent city member agency but still in district, being an overlapping area and considered here as being a part of the city.
- (2) Revised to conform with data received from agency.
- (3) Does not include 1,360 acres overlapping in City of Oceanside.
- (4) Does not include 27 acres overlapping in City of Oceanside.
- (5) Does not include 1,203 acres overlapping in City of Escondido.
- (6) Does not include 166 acres overlapping in City of San Diego.
- (7) Does not include 5,580 acres overlapping in City of San Diego.
- (8) Does not include 3 acres overlapping in City of San Diego.
- (9) Does not include 160 acres overlapping in City of Oceanside.
- (10) Does not include 217 acres overlapping in City of San Diego.

TABLES

TABLE 2
POPULATION GROWTH—COUNTY AND AUTHORITY AREA
1910 to 1959
(Includes Resident Military Personnel)

Year (as of April 1)	COUNTY		AUTHORITY		Percent of County Population in Authority
	Total Population (1)	Average Annual Growth	Total Population (2)	Average Annual Growth	
1910	61,665		46,000		74
1920	112,248	5,058	87,000	4,100	78
1930	209,659	9,741	173,000	8,600	82
1940	289,348	7,969	248,274	7,600	86
1946 (3).....	502,804	26,746	(3) 440,659	20,361	88
1950	556,808				
1956	819,300	43,749	751,500	49,936	92
1957	900,000	80,700	783,550	32,050	86
1958	943,000	43,000	842,600	59,050	89
1959	1,006,800	63,800	909,000	66,400	90

- (1) County population from U.S. Census Bureau Reports.
- (2) Authority population based on U.S. Census Bureau Reports. Population in years prior to Authority organization in 1944 is for Authority area as of 1944. Population in later years is for Authority as then constituted.
- (3) Based on Special Census, U.S. Census Bureau, exclusive of emergency military personnel due to World War II.

TABLE 3
POPULATION—AUTHORITY MEMBER AGENCIES AND COUNTY
(Includes Resident Military Personnel)

Member Agencies	Population—U. S. Census						Annual Increase 1950-1959 Percent	Density of Population 1959 Per Sq. Mile
	1940		1950		1959			
	Area 6/30/59 Acres	(1)	(2)	Decade Increase Percent	Estimate (4)	Per Acre		
Bueno Colorado M.W.D.	50,540	—	—	—	28,500	—	0.56	361
Carlsbad M.W.D.	20,811	—	—	—	10,000	—	0.48	308
In City of Carlsbad	(4,780)	—	—	—	(9,500)	—	1.99	1,272
Escondido, City of	3,135	4,560	6,608	45	13,000	11	4.15	2,654
Fallbrook Public Utility Dist.	15,469	2,300	5,500	139	10,000	9	0.65	414
Helix Irrigation District	30,815	17,100	44,162	158	113,000	17	3.67	2,347
In City of El Cajon	(6,167)	(1,471)	(5,600)	281	(34,900)	58	5.66	3,622
In City of La Mesa	(4,393)	(3,925)	(10,946)	178	(28,500)	18	6.49	4,152
National City, City of	4,755	10,344	21,199	105	34,300	7	7.21	4,617
Oceanside, City of	16,499	4,651	12,880	177	24,000	10	1.45	931
Otay M.W.D.	49,944	—	—	—	2,200	—	0.04	28
Poway M.W.D.	10,800	—	—	—	2,800	—	0.26	166
Rainbow M.W.D.	40,040	—	—	—	2,500	—	0.06	40
Ramona M.W.D.	29,900	—	—	—	5,300	—	0.18	113
Rincon del Diablo M.W.D.	21,197	—	—	—	13,300	—	0.63	402
Rio San Diego M.W.D.	18,705	—	—	—	12,300	—	0.66	421
San Diego, City of	125,663	203,341	334,387	64	554,000	7	4.41	2,822
San Diego, City of	3,996	(3) 2,400	6,223	159	13,900	14	3.48	2,226
San Dieguito Irrigation Dist.	10,082	(3) 2,000	3,000	50	7,200	16	0.71	457
Santa Fe Irrigation District	15,342	10,938	28,927	164	59,600	12	3.88	2,486
South Bay Irrigation District	(5,507)	(5,138)	(15,927)	210	(38,600)	16	7.01	4,486
In City of Chula Vista	53,160	—	—	—	3,100	—	0.06	37
Valley Center M.W.D.	—	—	—	—	—	—	—	—
Total Authority	520,853	257,634	462,886	80	909,000	11	1.75	1,117
San Diego County	2,725,100	289,348	556,808	92	1,006,800	9	0.37	236

(1) Population in agencies other than cities was estimated from population of judicial townships.

(2) Population in agencies other than cities was estimated from population of judicial townships.

(3) Estimated.

(4) Estimated by agencies.

TABLE 4
ASSESSED VALUATIONS—AUTHORITY MEMBER AGENCIES AND COUNTY

Member Agencies	Area 6/30/59 Acres	Assessed Valuation—Secured and Unsecured				Assessed Valuation 1959-60 Total	
		1957-58		1958-59			
		Total	Per Acre	Total	Per Acre		
Bueno Colorado M.W.D.	50,540	\$ 24,241,330	629	\$ 31,811,980	629	31.2	\$ 34,725,530
Carlsbad M.W.D.	20,811	22,995,130	1,236	25,721,020	1,236	11.9	28,124,700
Escondido, City of	3,135	14,711,500	5,160	16,176,310	5,160	10.0	17,689,990
Fallbrook Public Utility District	15,469	7,762,150	540	8,348,090	540	7.5	9,115,600
Helix Irrigation District	30,815	110,951,360	4,020	123,873,810	4,020	11.6	144,393,860
National City, City of	4,755	27,063,240	6,236	29,746,300	6,236	9.9	32,125,650
Oceanside, City of	16,499	23,234,310	1,473	24,295,260	1,473	4.6	31,245,750
Otay M.W.D.	49,944	3,507,390	77	3,821,170	77	9.0	6,229,360
Poway M.W.D.	10,800	2,295,230	237	2,771,840	237	20.8	6,697,700
Rainbow M.W.D.	40,040	4,049,060	110	4,397,740	110	8.6	4,515,790
Ramona M.W.D.	29,900	4,116,370	144	4,312,550	144	4.8	4,815,050
Rincon del Diablo M.W.D.	21,197	16,580,520	840	17,803,600	840	7.4	20,125,400
Rio San Diego M.W.D.	18,705	10,397,300	628	11,738,470	628	12.9	14,910,230
San Diego, City of	125,663	648,427,780	5,733	720,367,360	5,733	11.1	790,171,450
San Dieguito Irrigation Dist. (2)	3,996	10,724,020	3,004	12,003,200	3,004	11.9	13,154,840
Santa Fe Irrigation District	10,082	9,374,930	1,267	12,777,780	1,267	36.3	15,659,250
South Bay Irrigation District	15,342	60,988,380	4,427	67,920,390	4,427	11.4	81,602,030
Valley Center M.W.D.	53,160	3,702,640	75	3,973,640	75	7.3	4,325,370
Total Authority	520,853	\$ 1,005,122,640	2,154	\$ 1,121,860,510	2,154	11.6	\$ 1,259,627,550
San Diego County	(1) 1,250,000	\$ 1,096,640,460	971	\$ 1,214,275,720	971	10.7	\$ 1,356,820,650

(1) Excluding 1,475,100 acres of tax-exempt lands in San Diego County.

(2) Includes area excluded from Agency but not from Authority.

SAN DIEGO COUNTY WATER AUTHORITY

TABLE 5
SALES OF COLORADO RIVER WATER—FISCAL YEAR 1958-59
(All Figures in Acre Feet)

Member Agencies	July	August	Sept.	Oct.	Nov.	Dec.	Total 6 Months
Buena Colorado M.W.D.	97.0	137.3	1,051.3	363.4	97.9	44.3	1,791.2
Carlsbad M.W.D.	406.1	409.2	376.2	217.0	97.9	201.9	1,708.3
Escondido, City of	152.9	149.2	130.6	135.2	111.0	119.4	798.3
Fallbrook P.U.D.	1,003.5	939.1	961.6	1,077.4	680.5	639.4	5,301.5
Helix I.D.	793.9	845.0	710.9	1,282.1	1,034.1	1,340.2	6,006.2
National City & South Bay I.D.	325.4	335.9	124.4	127.4	125.4	124.9	1,163.4
Oceanside, City of	334.3	370.2	341.0	319.6	300.8	282.7	1,948.6
Otay M.W.D.	4.0	20.0	25.0	25.0	25.0	25.0	124.0
Poway M.W.D.	118.5	138.4	131.0	130.7	76.3	79.7	674.6
Rainbow M.W.D.	631.9	699.3	653.4	656.9	366.4	371.4	3,379.3
Ramona M.W.D.	1.7	14.7	31.3	1.8	13.1	13.2	75.8
Rincon del Diablo M.W.D. ..	67.2	70.5	393.6	177.2	38.3	433.2	1,200.0
Rio San Diego M.W.D.	124.4	117.3	101.5	93.5	67.1	63.4	566.8
San Diego, City of	3,000.0	3,000.0	3,000.0	2,274.0	500.0	500.0	12,274.0
San Dieguito I.D.	0	0	0	0	0	0	0
Santa Fe I.D.	0	0	0	0	0	0	0
Valley Center M.W.D.	91.4	85.8	75.5	77.5	33.8	43.3	407.3
Total Sales to Agencies	7,152.2	7,331.9	8,107.1	6,958.5	3,567.6	4,302.0	37,419.3
Total Sales to Others	11.2	32.9	17.0	24.2	21.0	27.1	133.4
Total Sales to Agencies and Others	7,165.4	7,364.8	8,124.1	6,982.7	3,588.6	4,329.1	37,552.7
Total to Authority Storage	+3,115.5	+1,561.1	+1,420.8	+2,126.6	+627.7	+76.4	+8,928.1
Total from Authority Storage	0	-20.0	-963.8	-388.4	-122.9	-69.3	-1,566.4
Total from Aqueduct	10,278.9	8,905.9	8,579.1	8,720.9	4,093.4	4,336.2	44,914.4
Rate of Flow:							
c.f.s. to Agencies and Others	120.4	119.8	136.3	113.5	60.3	70.4	102.9
c.f.s. to Authority Storage ..	+32.3	+25.4	+23.8	+34.6	+10.6	+1.2	+24.5
c.f.s. from Authority Storage	0	-0.4	-16.2	-6.3	-2.1	-1.1	-4.3
Total from Aqueduct	172.7	144.8	143.9	141.8	68.8	70.5	123.1

The Metropolitan Water District delivered to Authority 102,778.5 acre feet, plus 144.7 acre feet transported by Authority to others in San Diego County, or 1445.4 acre feet more than total Authority deliveries.

*Includes 183.5 acre feet delivered to contractors for Second Aqueduct construction.

TABLES

TABLE 5 (Continued)

Jan.	Feb.	March	April	May	June	Total 6 Months	Yearly Total	Yearly Average c.f.s.
54.8	41.9	418.1	183.1	102.1	85.5	885.5	2,676.7	3.70
143.9	91.3	195.6	287.3	318.9	365.9	1,402.9	3,111.2	4.30
341.1	112.2	144.7	165.7	187.5	253.8	1,205.0	2,003.3	2.77
551.0	229.6	509.6	622.4	788.0	1,030.1	3,730.7	9,032.2	12.48
1,238.6	889.0	1,356.1	1,446.9	1,865.1	1,597.1	8,392.8	14,399.0	19.89
156.5	676.4	908.8	887.3	899.9	816.6	4,345.7	5,509.1	7.61
232.6	187.2	246.6	320.8	370.7	358.5	1,716.4	3,665.0	5.06
0	0	0	25.0	25.0	25.0	75.0	199.0	0.27
77.0	26.5	88.8	127.4	147.7	169.2	636.6	1,311.2	1.81
356.1	109.0	453.3	529.0	567.3	699.9	2,714.6	6,093.9	8.42
7.8	6.6	9.8	6.4	31.3	31.2	93.1	168.9	0.23
193.6	154.8	552.5	241.2	368.8	334.2	1,845.1	3,045.1	4.21
66.5	46.6	88.3	113.1	127.1	226.3	667.9	1,234.7	1.70
500.0	500.0	4,732.5	7,964.5	8,106.7	7,285.6	29,089.3	41,363.3	57.13
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
26.6	14.4	33.1	50.8	80.9	163.1	368.9	776.2	1.07
3,946.1	3,085.5	9,737.8	12,971.1	13,987.0	13,442.0	57,169.5	94,588.8	130.65
18.2	9.1	15.4	43.8	25.5	30.0	142.0	275.4	0.38
3,964.3	3,094.6	9,753.2	13,014.9	14,012.5	13,472.0	57,311.5	94,864.2	131.03
+218.7	+4,181.5	+3,508.1	+298.5	+287.9	+248.3	+8,745.0	+17,671.1	+24.41
-54.8	-41.9	-1,548.1	-1,894.8	-2,682.8	-3,268.7	-9,491.1	-11,057.5	-15.27
4,128.2	7,234.2	11,713.2	11,418.6	11,617.6	10,451.6	56,563.4	101,477.8*	140.17
64.5	55.7	158.6	218.7	227.9	226.4	159.6	131.0	
+3.5	+75.3	+37.1	+5.0	+4.7	+4.2	+24.4	+24.4	
-0.9	-0.7	-25.2	-31.8	-43.6	-34.9	-26.4	-15.2	
67.1	130.3	190.5	191.9	189.0	175.7	157.6	140.2	

TABLE 6
SALES OF COLORADO RIVER WATER—1949 to 1959
(All figures in acre feet)

Member Agencies	(1) 1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59
Bueno Colorado M.W.D.	—	—	—	—	0	3,627.3	5,433.5	7,315.4	2,665.3	2,676.7
Carlsbad M.W.D.	—	—	—	—	54.0	1,599.7	1,416.8	975.5	1,988.5	3,111.2
Escondido, City of	—	117.1	540.0	382.8	738.9	928.9	1,381.4	1,843.8	1,552.5	2,003.3
Fallbrook Public Utility District	5,004.0	3,979.2	2,209.7	3,366.1	5,720.4	7,030.7	6,566.5	7,228.5	5,446.5	9,032.2
Helix Irrigation District	4,792.6	8,282.5	5,314.8	5,100.5	5,311.4	11,609.5	13,552.8	14,967.9	14,059.8	14,399.0
National City and South Bay I.D.	10,973.2	12,964.7	6,649.0	0	4,893.5	5,706.2	12,273.9	10,823.0	10,680.2	5,509.1
Oceanside, City of	127.8	558.5	513.4	604.1	1,469.5	2,064.0	2,864.2	3,308.0	2,941.3	5,665.0
Otay M.W.D.	—	—	—	—	—	—	—	0	2.0	199.0
Poway M.W.D.	—	—	—	—	—	523.7	1,108.6	915.0	680.8	1,311.2
Rainbow M.W.D.	—	—	—	—	137.1	1,416.2	2,061.2	3,984.9	3,327.6	6,093.9
Ranoma M.W.D.	—	—	—	—	—	—	—	—	29.0	168.9
Rincon del Diablo M.W.D.	—	—	—	—	—	2,905.3	4,682.8	5,600.8	2,603.0	3,045.1
Rio San Diego M.W.D.	30.4	27.2	20.8	80.2	99.2	226.5	512.3	894.0	818.8	1,234.7
San Diego, City of	35,371.2	51,453.9	43,745.3	20,684.9	51,176.3	60,059.1	80,088.2	83,530.6	89,869.9	41,363.3
San Diego Irrigation District	1,655.0	1,043.8	691.0	0	32.8	913.3	598.0	2,012.5	1,171.3	0
Santa Fe Irrigation District	2,657.9	832.1	146.8	0	0	338.4	416.4	1,149.9	998.0	0
Valley Center M.W.D.	—	—	—	—	—	0	1.2	791.2	769.0	776.2
Total Sales to Agencies	58,612.1	79,259.0	60,030.8	30,418.6	69,635.1	98,968.8	132,977.8	145,361.0	139,603.5	94,588.8
Total Sales to Others	0	0	0	49.4	13.7	3.4	19.7	69.5	95.2	275.4
Total to Authority Storage	+10,652.0	+ 821.4	+5,765.2	+1,612.8	+1,722.2	+6,217.3	+10,608.6	+6,655.0	+10,451.8	+17,671.1
Total from Authority Storage	0	-6,265.5	-3,176.0	-3,314.5	-4,113.6	-2,975.7	-5,601.2	-7,710.3	-7,897.7	-11,057.5
Total from Aqueduct	69,264.1	73,814.9	62,618.0	28,566.3	67,257.4	102,213.8	137,984.9	144,375.2	142,232.8	*101,477.8
Rate of Flow:										
c.f.s. to Agencies and Others	81.0	109.5	82.7	42.1	96.2	136.7	183.2	200.3	193.0	131.0
c.f.s. to Authority Storage	+14.7	+1.1	+7.9	+2.2	+2.4	+8.6	+14.6	+9.2	+14.4	+24.4
c.f.s. from Authority Storage	0	-8.6	-4.4	-4.8	-5.7	-4.1	-7.7	-10.6	-10.9	-15.2
c.f.s. total from Aqueduct	95.7	102.0	86.2	39.5	92.9	141.2	190.1	198.9	196.5	140.2

(1) The operation of the First Aqueduct was formally initiated on November 27, 1947. For sales in intervening years see previous reports.
(2) Rio San Diego M.W.D., encompassing Lakeside I.D., was annexed to Authority June 7, 1956. Figures prior to that date are for Lakeside I.D. only.

* Includes 183.5 acre feet delivered to contractors for Second Aqueduct construction.

TABLE 7
WATER PRODUCTION WITHIN AUTHORITY AGENCIES—FISCAL YEARS 1946-47 to 1958-59
(All Figures in Acre Feet)

Member Agencies	From Local and Authority Supplies												
	1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59
Bueno Colorado M.W.D.	12,335	13,407	11,344	11,977	13,484	7,572	11,171	11,671	*12,707	13,043	13,058	11,098	15,000
Carlsbad M.W.D.	2,582	2,856	2,613	2,499	2,033	2,074	2,565	*2,961	2,445	2,972	2,891	2,607	3,923
Escondido, City of	835	954	801	858	*1,034	1,033	1,238	1,398	1,712	1,741	1,816	1,730	2,213
Fallbrook Public Utility District	2,596	*3,470	3,613	3,379	5,777	5,803	6,635	7,606	8,001	8,394	8,095	6,709	10,013
Helix Irrigation District	9,790	*10,290	9,325	10,204	11,412	9,858	13,524	15,319	15,557	15,998	16,541	15,848	21,595
National City and South Bay I.D.	10,319	*10,265	*11,293	*12,709	11,750	10,491	11,308	12,076	12,840	13,795	12,878	12,316	14,597
Oceanside, City of	2,319	*2,787	2,641	2,977	3,035	2,955	3,533	3,954	4,099	4,633	4,369	4,204	5,107
Otay M.W.D.	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	2
Poway M.W.D.	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	*554	1,120	917	755
Rainbow M.W.D.	179	385	699	892	1,336	1,120	1,657	*1,697	2,850	3,555	4,834	4,052	6,976
Ranoma M.W.D.	305	155	138	131	132	118	186	212	215	192	152	178	351
Rincon del Diablo M.W.D.	8,799	9,259	7,372	7,668	6,905	5,577	7,710	8,401	*10,023	9,804	9,451	7,881	11,733
Rio San Diego M.W.D.	90	*103	110	161	185	197	292	292	355	1,301	1,457	1,438	2,311
San Diego, City of:													
Inside City	49,431	*51,078	49,693	51,410	54,935	55,784	60,552	63,258	66,000	68,715	71,250	70,052	80,060
Outside City (not in Authority)	1,038	1,329	1,946	1,049	2,051	1,406	2,396	2,375	2,610	3,001	2,856	2,609	3,598
San Diego Irrigation District	3,569	3,034	*2,503	2,899	3,039	2,326	3,139	3,440	3,329	3,578	3,607	3,524	4,247
Santa Fe Irrigation District	5,312	5,491	*2,878	3,372	3,515	2,539	3,338	3,255	3,561	3,663	3,509	2,807	3,863
Valley Center M.W.D.	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	791	769
Total	107,899	112,863	106,769	114,185	120,621	106,853	129,264	138,113	146,638	155,305	158,472	148,579	187,839

* Delivery of Colorado River Water began this year.

† Includes evaporation losses of Colorado River Water in Sweetwater Reservoir.

(a) Not available.

(b) Figures shown for Rio San Diego M.W.D. prior to 1955-56 are for Lakeside I.D. only.

TABLE 8
WATER PRODUCTION OF AUTHORITY AGENCIES—FISCAL YEAR 1958-59

Member Agencies	TOTAL WATER PRODUCTION				LOCAL SUPPLY			AUTHORITY SUPPLY	
	as m.g.d.	as c.f.s.	as ac. ft./yr.	as ac. ft./yr.	Amount ac. ft.	Per- cent	Amount ac. ft.	Per- cent	
Bueno Colorado M.W.D.	13.39	20.72	14,999.5	12,322.8	82.2	2,676.7	17.8		
Carlsbad M.W.D.	3.50	5.42	3,922.6	811.4	20.7	3,111.2	79.3		
Escondido, City of	1.98	3.06	2,213.1	190.5	8.6	2,022.6	91.4		
Fallbrook Public Utility District	8.94	13.83	10,013.2	1,046.6	10.5	8,966.6	89.5		
Helix Irrigation District	19.28	29.83	21,595.0	7,196.0	33.3	14,399.0	66.7		
National City and South Bay I.D.	13.03	20.16	14,597.0	9,088.0	62.3	5,509.0	37.7		
Oceanside, City of	4.56	7.05	5,106.7	1,441.7	28.2	3,665.0	71.8		
Otay M.W.D.	0.13	0.20	146.4	0	0	146.4	100.0		
Poway M.W.D.	1.17	1.81	1,310.1	0	0	1,310.1	100.0		
Rainbow M.W.D.	6.23	9.64	6,976.1	882.2	12.6	6,093.9	87.4		
Ramona M.W.D.	0.31	0.49	551.4	190.3	54.2	161.1	45.8		
Rincon del Diablo M.W.D.	10.49	16.23	11,752.8	8,707.7	74.1	3,045.1	25.9		
Rio San Diego M.W.D.	2.06	3.19	2,310.7	1,076.0	46.6	1,234.7	53.4		
San Diego, City of:									
Inside City	71.48	110.59	80,060.4	19,940.3	24.9	60,120.1	75.1		
Outside City (Not in Authority)	3.21	4.97	3,598.3	3,598.3	100.0	0	0		
San Dieguito Irrigation District	3.79	5.87	4,246.5	4,246.5	100.0	0	0		
Santa Fe Irrigation District	3.45	5.33	3,862.5	3,862.5	100.0	0	0		
Valley Center M.W.D.	0.69	1.07	776.2	0	0	776.2	100.0		
Total	167.69	259.46	187,838.5	74,600.8	39.7	113,237.7	60.3		

NOTE: This table is a compilation of data furnished by member agencies. Figures include losses in transmission and distribution systems but not in conservation reservoirs.

TABLES

TABLE 9
UNIT WATER PRODUCTION—PER ACRE AND PER CAPITA 1958-59

Member Agencies	Gross Area (2) acres	Total Production of Water ac. ft.	Estimated Area Served by Water System acres	Water Production per Acre ac. ft./acre/yr.	Estimated Population	Water Production per Capita ac. ft./cap./yr.
Bueno Colorado M.W.D.	50,540	14,999.5	14,960	1.00	28,500	0.53
Carlsbad M.W.D.	20,811	3,922.6	12,700	0.31	10,000	0.39
Escondido, City of	3,135	2,213.1	3,130	0.71	13,000	0.17
Fallbrook Public Utility District	15,469	10,013.2	8,380	1.19	10,000	1.00
Helix Irrigation District	30,815	21,595.0	28,000	0.77	113,000	0.19
National City, City of	4,755	3,586.0	3,470	1.03	34,300	0.10
Oceanside, City of	16,499	5,106.7	8,050	0.63	24,000	0.21
Otay M.W.D.	49,944	146.4	3,300	0.04	2,200	0.07
Poway M.W.D.	10,800	1,310.1	5,180	0.25	2,800	0.47
Rainbow M.W.D.	40,040	6,976.1	14,980	0.47	2,500	2.79
Ramona M.W.D.	29,900	351.4	600	0.59	5,300	0.07
Rincon del Diablo M.W.D.	21,197	11,752.8	10,490	1.12	13,300	0.88
Rio San Diego M.W.D.	18,705	2,310.7	5,040	0.46	12,300	0.19
San Diego, City of	125,663	(1) 80,060.4	67,060	1.19	554,000	0.14
San Dieguito Irrigation District	3,996	4,246.5	3,990	1.07	13,900	0.31
Santa Fe Irrigation District	10,082	3,862.5	10,080	0.38	7,200	0.54
South Bay Irrigation District	15,342	11,011.0	8,450	1.30	59,600	0.18
Valley Center M.W.D.	53,160	776.2	7,800	0.10	3,100	0.25
Total and Average	520,853	184,240.2	215,660	0.85	909,000	0.20

(1) Does not include production by City of San Diego for areas outside City (not in Authority).

(2) Does not include overlapping area as shown in Table 1.

TABLE 10
AGRICULTURAL USE OF WATER

Agency	WATER USED FOR AGRICULTURAL PURPOSES					Percent of Agricultural Water to Total Production	
	Total Water Production (ac-ft)	From Local Supply (ac-ft)	From Authority Supply (%)	Total (ac-ft)	Percent of Agricultural Water to Total Production		
	(ac-ft)	(%)	(ac-ft)	(%)			
Bueno Colorado M.W.D.	14,999.5	11,463.1	91.7	1,043.1	8.3	12,506.2	83.4
Carlsbad M.W.D.	3,922.6	912.1	33.6	1,799.9	66.4	2,712.0	69.1
Escondido, City of	2,213.1	(a)		(a)		(a)	(a)
Fallbrook P.U.D.	10,013.2	973.6	10.6	8,214.0	89.4	9,187.6	91.8
Helix Irrigation District	21,595.0	3,353.6	37.1	5,695.3	62.9	9,048.9	41.9
National City & South Bay I.D.	14,597.0	2,017.8	65.8	1,050.8	34.2	3,068.6	21.0
Oceanside, City of	5,106.7	(a)		(a)		(a)	(a)
Oray M.W.D.	146.4	(a)		(a)		(a)	(a)
Poway M.W.D.	1,310.1	0	0	1,019.2	100.0	1,019.2	77.8
Rainbow M.W.D.	6,976.1	868.2	12.6	5,996.7	87.4	6,864.9	98.4
Ramona M.W.D.	351.4	10.0	10.9	81.5	89.1	91.5	26.0
Rincon del Diablo M.W.D.	11,752.8	8,404.9	80.0	2,097.9	20.0	10,502.8	89.4
Rio San Diego M.W.D.	2,310.7	151.7	46.7	172.9	53.3	324.6	14.0
San Diego, City of	80,060.4	4,450.0	70.2	1,889.1	29.8	6,339.1	7.2
San Dieguito I.D.	4,246.5	(b)		(b)		(b)	(b)
Santa Fe I.D.	3,862.5	(b)		(b)		(b)	(b)
Valley Center M.W.D.	776.2	145.5	22.5	500.9	77.5	646.4	83.3
Total	184,240.2	32,750.5	52.6	29,561.3	47.4	62,311.8	33.8

(a) No report received from agency.
(b) Included in City of San Diego.

TABLE 11
AUTHORITY STORAGE IN SAN VICENTE RESERVOIR
(Fiscal Year 1958-59)

Member Agencies	Total Quantity in Storage 7/1/58 (acre feet)	Placed into Storage during Fiscal Year (acre feet)	Withdrawn during Fiscal Year		Total Quantity in Storage 6/30/59 (acre feet)
			By Delivery (acre feet)	By Evaporation (acre feet)	
Bueno Colorado M.W.D.	1,380.4	1,397.9	2,013.3	42.9	722.1
Carlsbad M.W.D.	1,637.5	704.5	487.8	105.2	1,749.0
Escondido, City of	448.0	111.6	165.7	24.2	369.7
Fallbrook Public Utility District	0	7,973.6	2,470.2	241.3	5,262.1
Helix Irrigation District	3,574.6	0	1,911.5	126.5	1,536.6
National City & South Bay I.D.	0	0	0	0	0
Oceanside, City of	945.7	3.6	269.4	36.8	643.1
Otay M.W.D.	781.0	130.0	195.0	27.7	688.3
Poway M.W.D.	0	1,680.7	410.9	56.6	1,213.2
Rainbow M.W.D.	0	2,801.3	1,937.4	79.0	784.9
Ramona M.W.D.	527.0	500.0	13.9	47.6	965.5
Rincon del Diablo M.W.D.	725.2	437.0	848.9	37.1	296.2
Rio San Diego M.W.D.	1,019.6	32.2	168.2	42.9	840.7
San Diego, City of	0	0	0	0	0
San Dieguito Irrigation District	0	0	0	0	0
Santa Fe Irrigation District	0	0	0	0	0
Valley Center M.W.D.	434.0	1,914.4	165.3	100.3	2,082.8
Authority (for evaporation)	372.7	*-35.7	0	337.0	0
Total	11,845.7	17,671.1	11,057.5	1,305.1	17,154.2

* Reallocated to Agencies.

TABLE 12
CHEMICAL CHARACTER OF NATURAL COLORADO RIVER
WATER AT WEST PORTAL OF SAN JACINTO TUNNEL

Year Ending June 30, 1959

Samples taken at entrance to San Diego Aqueduct by M.W.D.
and analyzed at District Laboratory

Month	Total Hardness as P.P.M. CaCO ₃	Non Carbonate Hardness as P.P.M. CaCO ₃	Alkalinity as P.P.M. CaCO ₃		Magnesium as P.P.M. of Mg.	Hydrogen Ion Concentration	Temperature when sampled F°
			Total	Phenolphthalein			
July	310	193	117	2	25.0	8.4	76
August	305	187	118	0	25.0	8.2	80
September	296	184	112	0	24.0	8.1	80
October	301	187	114	0	24.5	8.1	—
November	300	188	112	0	25.0	8.1	68
December	308	191	117	0	25.0	8.0	58
January	306	189	117	0	24.5	8.3	55
February	309	190	119	2	24.0	8.3	50
March	311	193	119	0	24.5	8.2	58
April	309	190	119	2	25.0	8.4	61
May	313	191	122	0	24.5	8.3	67
June	317	198	119	3	26.0	8.4	—
Average	307	190	117	1	25.0	8.2	65
Maximum	317	198	122	3	26.0	8.4	80
Minimum	296	184	112	0	24.0	8.0	50

TABLE 13
ALLOCATION OF RIGHT TO PURCHASE AUTHORITY WATER
As of June 30, 1959

Member Agencies	Total Amount Paid by Each Member Agency to 6/30/59	Amount Remaining to be Paid under Terms of Annexation	Total Contributions Paid and Contracted for	Allocation	
				Percentage of Authority Supply	Equivalent Flow c.f.s.
Buena Vista M.W.D.	\$ 189,166	\$ 22,029	\$ 211,195	2.48	4.86
Carlsbad M.W.D.	135,943	0	135,943	1.60	3.14
Escondido, City of	107,219	4,083	111,302	1.31	2.57
Fairbrook P.U.D.	63,295	8,500	71,795	0.84	1.65
Helix I.D.	814,275	6,887	821,162	9.65	18.91
National City, City of	220,112	0	220,112	2.59	5.08
Oceanside, City of	193,516	0	193,516	2.28	4.47
Oray M.W.D.	16,903	15,013	31,916	0.38	0.74
Poway M.W.D.	16,586	1,837	18,423	0.22	0.43
Rainbow M.W.D.	31,797	3,500	35,297	0.41	0.80
Ranoma M.W.D.	12,895	39,875	52,770	0.62	1.22
Rincon del Diablo M.W.D.	137,059	0	137,059	1.61	3.16
Rio San Diego M.W.D.	50,122	27,049	77,171	0.91	1.78
San Diego, City of	5,746,535	0	5,746,535	67.56	132.41
San Diego, City of	91,257	0	91,257	1.07	2.10
Santa Fe I.D.	82,517	0	82,517	0.97	1.90
South Bay I.D.	434,336	0	434,336	5.11	10.02
Valley Center M.W.D.	24,181	9,141	33,322	0.39	0.76
Total Authority	\$8,367,714	\$137,914	\$8,505,628	100.00	196.00

TABLE 14
STATEMENT OF FINANCIAL POSITION
June 30, 1959

ASSETS			
CURRENT ASSETS—GENERAL FUND:			
Cash with treasurer	\$ 280,556.71		
Petty cash	100.00		
Accounts receivable	232,659.07		
Inventory of water in storage	238,586.20		
Delinquent taxes receivable	\$ 5,115.36		
Less allowance for delinquency ..	5,115.36		
		\$ 751,901.98	
SPECIAL FUND ASSETS:			
General Reserve Fund:			
Cash with treasurer	169,423.57		
Investments	213,420.94	382,844.51	
Waterworks Bonds, 1947, Interest & Sinking Fund:			
Cash with treasurer	28,711.47		
Cash with fiscal agent, for bond interest	15,000.00		
Investments	520,269.70		
Delinquent taxes receivable	3,237.18		
Less allowance for delinquency ..	3,237.18		
		563,981.17	
U. S. Government Contract Fund:			
Cash with treasurer	52,758.60		
Due from Metropolitan Water District	12,083,974.03		
Delinquent taxes receivable	17,551.75		
Less allowance for delinquency ..	17,551.75		
		12,156,732.63	
Special Tax Fund:			
Cash with treasurer	22,752.29		
Investments	410,126.53		
Annexation charges receivable— not due	127,614.13		
Delinquent taxes receivable	6,627.16		
Less allowance for delinquency ..	6,627.16		
		560,472.95	
Waterworks Bonds, 1957, Improvement Fund:			
Cash with treasurer	729,323.02		
Accounts receivable	13,200.16		
Investments	9,985,455.49		
Bonds authorized—unissued	12,000,000.00	22,727,976.67	
Waterworks Bonds, 1957, Interest & Redemption Fund:			
Cash with treasurer	197,499.22		
Cash with fiscal agent for bond interest	5,041.50		
Delinquent taxes receivable	3,930.78		
Less allowance for delinquency ..	3,930.78		
		202,540.72	
FIXED ASSETS:			
Participation rights in Metropolitan Water District	36,557,775.87		
Plant	18,021,500.62		
Less allowance for depreciation ..	1,452,547.54	16,569,153.08	
		52,926,928.95	
Work in progress	16,103,781.77	69,030,710.72	
		<u>\$106,357,161.35</u>	

TABLE 14 (Continued)
STATEMENT OF FINANCIAL POSITION
June 30, 1959

LIABILITIES			
CURRENT LIABILITIES—GENERAL FUND:			
Accounts payable	\$ 151,729.95		
Unapplied credits for irrigation water	9,428.10		
Advances by agencies for construction	55,815.22	\$ 216,971.27	
CURRENT LIABILITIES—SPECIAL FUNDS:			
Contracts payable	1,848,966.89		
Retained percentage on contract payments	776,917.93	2,625,884.82	
LONG-TERM OBLIGATIONS:			
General obligation bonds payable— not due	24,475,000.00		
Estimated balance on U. S. Government contract for repayment of First Aqueduct cost	22,931,716.54		
Balance of annexation charges to Metropolitan Water District	12,404,747.27	59,811,463.81	
SURPLUS AND RESERVES:			
Net equity in fixed assets		9,219,246.91	
Reserves for encumbrances:			
General Fund	11,187.26		
Waterworks Bonds, 1957, Improvement Fund	13,780,618.21	13,791,805.47	
Reserves for debt redemption:			
For retirement of general obligation bonds	766,521.89		
For retirement of U. S. Government contract	12,156,732.63	12,903,254.52	
Appropriated:			
For petty cash fund balance	100.00		
For general reserve fund balance ..	382,844.51		
For special tax fund balance	480,357.86		
For Waterworks Bonds, 1957, Improvement Fund:			
Reserve for authorized expenditures	5,889,718.39		
For incomplete projects (continuing appns.)—Table 16:			
General Fund	\$ 31,857.35		
Waterworks Bonds, 1957, Improvement Fund	431,755.25		
Special Tax Fund	80,115.09	543,727.69	7,296,748.45
Unappropriated surplus—Table 15			491,786.10
			<u>\$106,357,161.35</u>

SAN DIEGO COUNTY WATER AUTHORITY

TABLE 15
STATEMENT OF INCOME AND SURPLUS—
UTILITY OPERATIONS
July 1, 1958 to June 30, 1959
INCOME DIVISION

OPERATING INCOME:			
Water sales			\$1,556,396.82
DEDUCT OPERATING COSTS:			
Cost of water sold:			
Inventory of water in storage			
July 1, 1958	\$ 134,853.60		
Water purchased	1,468,482.00		
Storage charges	40,561.18		
		1,643,896.78	
Less inventory of water in storage			
June 30, 1959	238,586.20	\$1,405,310.58	
Direct operating expense	41,274.01		
General and administrative expense ..	116,508.27		
Net operating costs			1,563,092.86
Net income (deficit) before depreciation and debt service expense			(6,696.04)
DEDUCT DEPRECIATION AND DEBT SERVICE EXPENSE:			
Depreciation		187,713.00	
Debt service expense	389,500.36		
Less receipts from Metropolitan Water District	195,598.56	193,901.80	381,614.80
Net operating income (deficit)			(388,310.84)
ADD NON-OPERATING INCOME:			
Revenue from taxes (net)		223,018.05	
Earnings on investments		770.83	
Rentals		1,416.00	
Use of Authority facilities		1,414.50	
Miscellaneous income		415.68	
Debt service expense provided by:			
Bond Interest and Sinking Fund	31,000.00		
U. S. Government Contract Fund ..	162,901.80	193,901.80	420,936.84
Net income for the year to surplus division			\$ 32,626.00

TABLES

TABLE 15 (Continued)
STATEMENT OF INCOME AND SURPLUS—
UTILITY OPERATIONS
July 1, 1958 to June 30, 1959
SURPLUS DIVISION

SURPLUS, JULY 1, 1958			\$ 337,412.70
ADD:			
Net income for the year from income division	\$ 32,626.00		
Refunds of prior year's expenditures ..	18,480.52		
Depreciation charged to income, entailing no expenditure of current funds	187,713.00	238,819.52	
			576,232.22
DEDUCT:			
Expenditures from General Fund for:			
Additions to fixed assets	14,778.66		
Construction work in progress	37,710.11	52,488.77	
SURPLUS, JUNE 30, 1959			\$ 523,743.45
Consisting of:			
Appropriated surplus:			
For incomplete projects (continuing appropriations)	\$ 31,857.35		
For petty cash	100.00	\$ 31,957.35	
Unappropriated surplus:			
Invested in water in storage	238,586.20		
Available for appropriation	253,199.90	491,786.10	
Total as above			\$ 523,743.45

TABLE 16
STATEMENT OF APPROPRIATIONS AND EXPENDITURES
July 1, 1958 to June 30, 1959

E & A No.	Purpose	Prior Years' Appropriation Carried Over	Appropriations 1958-59
161	Engineering and Rights of Way, Second Aqueduct	\$	\$ 786,000.00
185	Bond Issue for financing Second Aqueduct	36,510.09	
192	Construction of Second Aqueduct, Spec. 201	4,875,441.74	
193	Construction of Second Aqueduct, Spec. 202	8,900,000.00	
194	Service Connection, Fallbrook, Sta. 1886+20		6,400.00
196	Service Connection, Fallbrook, Sta. 2101+50		28,500.00
198	Service Connection, Rainbow		24,000.00
199	Purchase of water for resale		1,683,000.00
200	Operation and maintenance		212,500.00
201	Interest and principal, 1947 Bonds		131,000.00
202	Payments on lease-purchase of First Aqueduct		1,237,710.00
203	Interest and principal, 1957 Bonds, Series A		280,575.00
204	Service Connection by Metropolitan Water District		19,000.00
205	Service Connection, Carlsbad, Sta. 2964+54		39,000.00
206	Construction of Second Aqueduct, Spec. 203		6,700,000.00
207	Interchange meters, Rio Nos. 1 and 3		4,000.00
208	Service Connection, Bueno No. 3, Sta. 2748+00		20,400.00
209	Revamp Service Connection, Bueno No. 1		8,400.00
210	Interest, 1957 Bonds, Series B		154,070.00
211	Service Connection, San Diego, Sta. 4462+67		60,000.00
212	Service Connection, Oceanside, Sta. 2502+50		7,000.00
213	Construction of Second Aqueduct, Spec. 204		6,379,000.00
214	Access roads, Second Aqueduct		25,000.00
	Subtotal	13,811,951.83	17,805,555.00
	Less advances by agencies		104,700.00
	Total—Authority	\$13,811,951.83	\$17,700,855.00
	<i>Distribution by Funds</i>		
	General Fund	\$ 36,510.09	\$ 1,928,500.00
	Waterworks Bonds, 1947, Interest and Sinking Fund		131,000.00
	U. S. Government Contract Fund		1,237,710.00
	Waterworks Bonds, 1957, Improvement Fund	13,775,441.74	13,884,000.00
	Waterworks Bonds, 1957, Interest and Redemption Fund		434,645.00
	Special Tax Fund		85,000.00
		\$13,811,951.83	\$17,700,855.00

TABLE 16 (Continued)
STATEMENT OF APPROPRIATIONS AND EXPENDITURES
July 1, 1958 to June 30, 1959

Expenditures 1958-59	Cancelled Appropriations	Unexpended Appropriations June 30, 1959	Encumbrances	Unencumbered Balance
\$ 696,652.32	\$ 89,347.68	\$	\$	\$
19,067.13		17,442.96		17,442.96
4,873,774.85		1,666.89		1,666.89
5,809,347.78		3,090,652.22	2,957,346.22	133,306.00
595.52		5,804.48		5,804.48
18,532.56		9,967.44		9,967.44
13,354.82		10,645.18		10,645.18
1,509,043.18	173,956.82			
172,618.31	39,881.69			
131,000.00				
1,237,709.20	.80			
280,575.00				
19,000.00				
23,400.08		15,599.92		15,599.92
1,959,831.64		4,740,168.36	4,603,063.76	137,104.60
2,547.61		1,452.39		1,452.39
5,922.52		14,477.48		14,477.48
1,074.64		7,325.36		7,325.36
154,070.00				
297.25		59,702.75		59,702.75
2,044.64		4,955.36		4,955.36
6,379,000.00		6,379,000.00	6,219,322.24	159,677.76
4,587.66		20,412.34		20,412.34
16,935,046.71	303,186.99	14,379,273.13	13,779,732.22	599,540.91
48,886.78		55,813.22		55,813.22
\$16,886,159.93	\$303,186.99	\$14,323,459.91	\$13,779,732.22	\$543,727.69
\$ 1,719,314.23	\$213,838.51	\$ 31,857.35	\$	\$ 31,857.35
131,000.00				
1,237,709.20	.80			
13,358,606.59	89,347.68	14,211,487.47	13,779,732.22	431,755.25
434,645.00				
4,884.91		80,115.09		80,115.09
\$16,886,159.93	\$303,186.99	\$14,323,459.91	\$13,779,732.22	\$543,727.69

SAN DIEGO COUNTY WATER AUTHORITY

TABLES

TABLE 17
STATEMENT OF REVENUES—ESTIMATED AND ACTUAL
July 1, 1958 to June 30, 1959

Source	Estimated Revenues	Actual Revenues	Actual Over or (Under) Estimate
Taxes, secured, current levy	\$1,014,050.00	\$1,037,905.01	\$ 23,855.01
Taxes, unsecured, current levy	117,550.00	119,253.75	1,703.75
Taxes, secured, prior years' levies	9,600.00	12,982.25	3,382.25
Taxes, unsecured, prior years' levies	1,200.00	(547.63)	(1,747.63)
Penalties on delinquent taxes	1,200.00	1,663.60	463.60
Miscellaneous tax on options		385.20	385.20
Receipts in lieu of taxes		1,663.84	1,663.84
Miscellaneous tax sales		233.13	233.13
Sale of water	1,673,300.00	1,556,396.82	(116,903.18)
Earnings on investments	90,000.00	144,698.50	54,698.50
Sale of discarded materials		37.18	37.18
Rentals	1,000.00	1,416.00	416.00
Contract payments from Metropolitan Water District	652,500.00	652,492.92	(7.08)
Use of Authority facilities	900.00	1,414.50	514.50
Miscellaneous	100.00	1,293.70	1,193.70
	<u>\$3,561,400.00</u>	<u>\$3,531,288.77</u>	<u>\$ (30,111.23)</u>
DISTRIBUTION BY FUNDS:			
General Fund	\$1,893,700.00	\$1,783,159.66	\$(110,540.34)
Waterworks Bonds, 1947, Interest and Sinking Fund	114,600.00	122,074.41	7,474.41
U. S. Government Contract Fund	1,213,300.00	1,226,367.38	13,067.38
General Reserve Fund	2,000.00	7,083.90	5,083.90
Waterworks Bonds, 1957, Improvement Fund		915.20	915.20
Waterworks Bonds, 1957, Interest and Redemption Fund	265,800.00	312,911.07	47,111.07
Special Tax Fund	72,000.00	78,777.15	6,777.15
	<u>\$3,561,400.00</u>	<u>\$3,531,288.77</u>	<u>\$ (30,111.23)</u>

TABLE 18
SUMMARY STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
July 1, 1958 to June 30, 1959

	Cash Balance July 1, 1958	Cash Receipts	Cash Disbursements	Inter-Fund Transfers		Cash Balance June 30, 1959
				In	Out	
General Fund	\$ 54,503.33	\$ 1,860,113.03	\$ 1,781,896.02	\$149,024.01	\$ 1,187.66	\$ 280,556.71
Waterworks Bonds, 1947, Interest and Sinking Fund	22,931.34	392,662.25	387,294.32	481.15	68.95	28,711.47
U. S. Government Contract Fund	62,802.78	1,225,122.77	1,237,709.20	87,887.01	85,344.76	52,738.60
General Reserve Fund	112,339.67	57,083.90	195,000.00	195,000.00	195,000.00	169,423.57
Waterworks Bonds, 1957, Improvement Fund	138,477.21	36,894,663.28	36,230,888.83	1,470.66	74,399.30	729,323.02
Waterworks Bonds, 1957, Interest and Redemption Fund	58,344.14	306,848.73	434,643.00	176,731.35	110,000.00	197,499.22
Special Tax Fund	56,292.02	358,441.21	227,387.43		144,613.51	22,732.29
Total All Funds	\$485,890.49	\$41,294,933.19	\$40,299,820.80	\$610,614.18	\$610,614.18	\$1,481,004.88

TREASURY CASH ON DEPOSIT—June 30, 1959

First National Trust and Savings Bank	\$1,591,859.94
Bank of America National Trust and Savings Association	43,322.50
San Diego Trust and Savings Bank	50,000.00
Total bank balances	1,685,182.44
Deduct:	
Outstanding warrants	\$185,855.06
Special deposit for payment of bond interest	18,322.50
Treasury cash, June 30, 1959	204,177.56
	<u>\$1,481,004.88</u>

SAN DIEGO COUNTY WATER AUTHORITY

TABLE 19
STATEMENT OF BONDS PAYABLE
June 30, 1959

Description	Rate of Interest	Date of	
		Issue	Maturity
Waterworks Bonds, 1947	2%-2½%	1947	1971
Waterworks Bonds, 1957	3%-6%	1957	1993

STATEMENT OF BONDED DEBT MATURITIES

Fiscal Year	Waterworks Bonds, 1947		
	Principal	Interest	Total
1959-60	\$ 100,000.00	\$ 29,000.00	\$ 129,000.00
1960-61	100,000.00	27,000.00	127,000.00
1961-62	150,000.00	24,500.00	174,500.00
1962-63	150,000.00	21,500.00	171,500.00
1963-64	150,000.00	18,500.00	168,500.00
1964-65	150,000.00	15,500.00	165,500.00
1965-66	150,000.00	12,500.00	162,500.00
1966-67	150,000.00	9,500.00	159,500.00
1967-68	100,000.00	7,000.00	107,000.00
1968-69	100,000.00	5,000.00	105,000.00
1969-70	100,000.00	3,000.00	103,000.00
1970-71	100,000.00	1,000.00	101,000.00
1971-72			
1972-73			
1973-74			
1974-75			
1975-76			
1976-77			
1977-78			
1978-79			
1979-80			
1980-81			
1981-82			
1982-83			
1983-84			
1984-85			
1985-86			
1986-87			
1987-88			
1988-89			
1989-90			
1990-91			
1991-92			
1992-93			
	<u>\$1,500,000.00</u>	<u>\$174,000.00</u>	<u>\$1,674,000.00</u>

TABLES

TABLE 19 (Continued)
STATEMENT OF BONDS PAYABLE
June 30, 1959

Bonds			Sinking Fund		
Authorized	Issued	Outstanding	Required	Actual	Excess
\$ 2,000,000.00	\$ 2,000,000.00	\$ 1,500,000.00	\$543,475.00	\$548,981.17	\$5,506.17
35,000,000.00	23,000,000.00	22,975,000.00			
<u>\$37,000,000.00</u>	<u>\$25,000,000.00</u>	<u>\$24,475,000.00</u>			

STATEMENT OF BONDED DEBT MATURITIES

Waterworks Bonds, 1957			Total		
Principal	Interest	Total	Principal	Interest	Total
\$ 50,000.00	\$ 887,915.00	\$ 937,915.00	\$ 150,000.00	\$ 916,915.00	\$ 1,066,915.00
80,000.00	884,915.00	964,915.00	180,000.00	911,915.00	1,091,915.00
90,000.00	880,115.00	970,115.00	240,000.00	904,615.00	1,144,615.00
90,000.00	874,715.00	964,715.00	240,000.00	896,215.00	1,136,215.00
100,000.00	869,315.00	969,315.00	250,000.00	887,815.00	1,137,815.00
120,000.00	863,315.00	983,315.00	270,000.00	878,815.00	1,148,815.00
130,000.00	856,115.00	986,115.00	280,000.00	868,615.00	1,148,615.00
160,000.00	848,315.00	1,008,315.00	310,000.00	857,815.00	1,167,815.00
180,000.00	838,715.00	1,018,715.00	280,000.00	845,715.00	1,125,715.00
240,000.00	827,915.00	1,067,915.00	340,000.00	832,915.00	1,172,915.00
290,000.00	813,515.00	1,103,515.00	390,000.00	816,515.00	1,206,515.00
350,000.00	796,115.00	1,146,115.00	450,000.00	797,115.00	1,247,115.00
470,000.00	778,115.00	1,248,115.00	470,000.00	778,115.00	1,248,115.00
530,000.00	758,240.00	1,288,240.00	530,000.00	758,240.00	1,288,240.00
580,000.00	735,840.00	1,315,840.00	580,000.00	735,840.00	1,315,840.00
620,000.00	715,160.00	1,335,160.00	620,000.00	715,160.00	1,335,160.00
680,000.00	693,060.00	1,373,060.00	680,000.00	693,060.00	1,373,060.00
750,000.00	668,235.00	1,418,235.00	750,000.00	668,235.00	1,418,235.00
800,000.00	640,860.00	1,440,860.00	800,000.00	640,860.00	1,440,860.00
825,000.00	611,670.00	1,436,670.00	825,000.00	611,670.00	1,436,670.00
870,000.00	581,545.00	1,451,545.00	870,000.00	581,545.00	1,451,545.00
910,000.00	549,790.00	1,459,790.00	910,000.00	549,790.00	1,459,790.00
960,000.00	516,865.00	1,476,865.00	960,000.00	516,865.00	1,476,865.00
1,000,000.00	481,630.00	1,481,630.00	1,000,000.00	481,630.00	1,481,630.00
1,040,000.00	444,905.00	1,484,905.00	1,040,000.00	444,905.00	1,484,905.00
1,090,000.00	406,690.00	1,496,690.00	1,090,000.00	406,690.00	1,496,690.00
1,120,000.00	366,065.00	1,486,065.00	1,120,000.00	366,065.00	1,486,065.00
1,160,000.00	324,325.00	1,484,325.00	1,160,000.00	324,325.00	1,484,325.00
1,195,000.00	281,112.50	1,476,112.50	1,195,000.00	281,112.50	1,476,112.50
1,230,000.00	236,590.00	1,466,590.00	1,230,000.00	236,590.00	1,466,590.00
1,270,000.00	190,790.00	1,460,790.00	1,270,000.00	190,790.00	1,460,790.00
1,310,000.00	143,517.50	1,453,517.50	1,310,000.00	143,517.50	1,453,517.50
1,350,000.00	94,772.50	1,424,772.50	1,350,000.00	94,772.50	1,424,772.50
1,355,000.00	45,237.50	1,400,237.50	1,355,000.00	45,237.50	1,400,237.50
<u>\$22,975,000.00</u>	<u>\$20,505,995.00</u>	<u>\$43,480,995.00</u>	<u>\$24,475,000.00</u>	<u>\$20,679,995.00</u>	<u>\$45,154,995.00</u>

TABLE 20
STATEMENT OF TAX ASSESSMENTS AND COLLECTIONS
July 1, 1958 to June 30, 1959

	Tax Assessments to Date	Adjustments to Tax Assessments	Tax Collections	Interest and Penalties	Tax on Options	Receipts in Lieu of Taxes	Miscellaneous Tax Sales	(Less) Refunds	Net Total Collections	Uncollected June 30, 1959
Fairbrook P.U.D.	\$ 59,985.98	20.58	\$ 59,645.21	\$ 232.20	\$.41	\$ 3,420.09	\$ 5.44	\$ 7.94	\$ 63,293.41	\$ 361.33
Helix Irrigation District	814,216.13	(310.20)	810,170.67	1,899.71	89.08	1,810.00	579.70	274.28	814,274.88	3,735.26
City of National City	214,477.98	(176.94)	213,675.42	599.81	6.90	6,251.30	56.39	478.03	220,111.79	623.62
City of Oceanside	190,624.79	518.39	190,584.76	414.56	5.11	2,561.13	51.68	101.61	193,515.63	558.42
City of San Diego	5,591,135.58	16,486.93	5,589,951.66	8,973.16	40.71	151,149.21	1,787.70	5,347.64	5,746,534.80	17,690.85
Ramona M.W.D.	13,103.61	(.03)	12,894.68	.68					12,895.36	208.90
Santa Fe I.D.	78,817.09	659.97	79,612.07	813.88	821.19	192.80	1,090.99	13.54	82,517.39	(135.01)
San Diego I.D.	90,722.56	178.59	90,439.68	296.04	3.88	618.14	98.86	199.45	91,257.15	461.47
City of Escondido	106,844.71	519.93	107,089.11	119.12			28.84	18.37	107,218.70	275.53
South Bay I.D.	423,672.06	748.57	420,685.79	707.09	.39	13,281.66	57.13	396.47	434,335.59	3,734.84
Rainbow M.W.D.	11,240.77	66.58	11,200.43	16.36				9.64	16,585.87	251.96
Poway M.W.D.	16,771.15	47.99	16,567.18	28.33				78.10	189,365.80	6,031.47
Bueno Colorado M.W.D.	178,834.78	5,303.91	178,107.22	359.51	1.73	10,750.00	45.44	7.12	137,059.13	424.01
Rincon del Diablo M.W.D.	86,053.75	1,118.83	86,748.57	199.31				8.51	135,942.73	422.31
Carlsbad M.W.D.	102,996.48	99.38	102,673.35	92.35		33,176.44			24,180.98	380.77
Valley Center M.W.D.	24,487.98	30.53	24,137.74	33.49				.65	50,122.57	1,373.32
Rio San Diego M.W.D.	51,147.50	146.83	49,921.01	146.12	.05	45.00	19.38	98.17	16,903.05	(47.96)
Oray M.W.D.	16,855.69	82.20	16,985.85	15.37						
Total member agencies	8,071,988.59	25,542.04	8,061,070.40	14,927.09	969.45	293,954.11	3,841.05	7,048.51	8,367,713.59	36,460.23
Withdrawn agencies	4,123.99	31.04	4,153.03	10.60	.15	186.64	2.49	5.35	4,347.56	2.00
Total	\$8,076,112.58	\$25,573.08	\$8,065,223.43	\$14,937.69	\$969.60	\$294,140.75	\$3,843.54	\$7,053.86	\$8,372,061.15	\$36,462.23

ANALYSIS OF UNCOLLECTED TAXES BY FUNDS

General Fund	\$ 5,115.36
Waterworks Bonds, 1947, Interest and Sinking Fund	3,237.18
U. S. Government Contract Fund	17,551.75
Waterworks Bonds, 1957, Interest and Redemption Fund	3,930.78
Special Tax Fund	6,627.16
	<u>\$36,462.23</u>

TABLE 21
STATEMENT OF ASSESSED VALUATIONS AND TAX RATES TO JUNE 30, 1959

Fiscal Year	Secured		Public Utilities	Unsecured		Total (3)	Tax Rate per \$100	
	Real	Personal		Personal	Unsecured		Secured	Unsecured
1945-1946	\$212,082,975	\$ 28,253,700	\$ 29,960,130	\$ 270,296,805	\$0.04	\$		
1946-1947	208,715,150 (1)	29,433,450	30,665,910	268,814,510	0.04			0.04
1947-1948	233,579,990	32,740,680	40,977,850	307,298,520 (2)	0.14			0.04
1948-1949	254,227,570	37,482,020	47,177,300	338,886,890	0.14			0.14
1949-1950	290,351,875	42,429,140	45,743,200	378,524,215	0.10			0.14
1950-1951	306,104,930	43,595,730	44,717,740	394,418,400	0.10			0.10
1951-1952	344,620,030	48,452,940	50,904,035	443,977,005	0.10			0.10
1952-1953	382,948,860	53,208,220	63,996,330	500,153,410	0.12			0.10
1953-1954	490,709,350	63,092,050	69,147,150	622,948,550	0.10			0.12
1954-1955	546,272,880	69,243,550	79,629,790	695,146,220	0.10			0.10
1955-1956	627,062,960	87,485,390	79,936,450	794,484,800	0.09			0.10
1956-1957	680,824,400	101,224,260	97,950,800	879,999,460	0.09			0.09
1957-1958	761,088,330	111,151,890	128,785,440	1,001,025,660	0.09			0.09
1958-1959	865,283,080	128,479,290	128,124,720	1,121,887,090	0.10			0.09
1959-1960*	979,491,050	145,317,290	134,846,730	1,259,655,070	0.11			0.10

Debt limit 15 percent of last equalized assessed valuation of property.

Basis of assessment approximately 40 per cent of appraised value.

(1) City of Coronado secured assessed valuation not included in this or subsequent tax levies by the Authority, having withdrawn from the Authority prior to 1946-47.

(2) City of Coronado not included in this or subsequent total valuation.

(3) Includes areas excluded from Authority.

* Data for 1959-1960 were available before completion of report and are included for convenience of reader.

TABLES

SAN DIEGO COUNTY WATER AUTHORITY

TABLE 22
TAX LEVIES AND TAX COLLECTIONS
Fiscal Years 1945-46 to 1958-59

Fiscal Year	Tax Levy (1)	Collection of Current Year's Taxes During Fiscal Year	Percentage of Levy Collected During Fiscal Year	Adjustments to Prior Years' Levies	Collection of Prior Years' Taxes During Fiscal Year	Total Tax Collections	Ratio of Total Collections to Adjusted Tax Levy (2)	Accumulated Delinquent Taxes	Ratio of Accumulated Delinquent Taxes to Adjusted Tax Levy (2)
1945-46	\$ 96,131.33	\$ 94,656.51	98.47	\$	\$	\$ 94,656.51	98.47	\$ 1,474.82	1.53
1946-47	107,808.89	105,753.78	98.09		1,090.25	106,844.03	99.11	2,439.68	2.26
1947-48	389,591.57	381,563.14	97.94		1,882.72	383,445.86	98.42	8,585.39	2.20
1948-49	474,520.78	459,504.39	96.84		5,916.41	465,420.80	98.08	17,685.37	3.73
1949-50	401,112.07	392,732.15	97.91	329.58	13,342.55	406,074.70	101.15	13,052.32	3.25
1950-51	397,970.61	390,274.43	98.07	373.44	8,217.82	398,492.25	100.03	12,904.12	3.24
1951-52	450,405.19	441,242.12	97.97	978.87	7,699.55	448,941.67	99.46	15,346.51	3.40
1952-53	594,603.48	585,417.35	98.46	(1,140.34)	12,567.93	597,985.28	100.76	10,824.37	1.82
1953-54	652,335.08	640,239.42	98.15	4,213.42	9,942.33	650,181.75	99.03	17,191.12	2.62
1954-55	709,678.89	695,200.64	97.96	1,295.13	12,638.30	707,838.94	99.56	20,326.20	2.86
1955-56	803,375.25	788,734.26	97.41	(2,099.58)	12,140.64	800,874.90	99.95	20,726.97	2.59
1956-57	874,774.45	861,461.66	98.48	576.90	13,036.01	874,517.67	99.90	21,560.65	2.46
1957-58	965,006.57	946,445.55	98.08	958.17	12,890.09	959,335.64	99.31	28,189.75	2.92
1958-59	1,178,885.91	1,157,265.98	98.17	13,347.45	13,347.45	1,170,613.43	99.30	36,462.23	3.09

(1) Including adjustments to current year's levy.
(2) Including adjustments to current and prior years' levies.

TABLE 23
SAN DIEGO COUNTY WATER AUTHORITY
ANNEXATION CHARGES, ASSESSMENTS AND BALANCES

Area	Date of Annexation	Amount of Annexation Charge	Period of Special Assessments		Special Assessments to 6/30/58	Fiscal Year 1958-59 Special Tax Rate Assessments \$/100	Remaining Balance of Annexation Charges 6/30/59	
			First Year	Last Year				
Annexation Charges Completed To June 30, 1958	—	\$209,126.00	—	—	\$209,126.00	\$ 0	\$ 0	
Annexation Charges Outstanding as of June 30, 1958								
Bueno Colorado M.W.D.	6-11-54	122,400.00	1955-56	1959-60	75,362.31	25,009.06	8 22,028.63	
Escondido, City of	10-9-50	27,500.00	1951-52	1960-61	20,181.84	3,235.26	2 4,082.90	
Fallbrook P.U.D.								
Annexation of 1958	11-24-58	8,500.00	1959-60	1968-69	0	0	0 8,500.00	
Helix I.D.								
El Cajon Dry Island Annexation	12-20-54	40,800.00	1955-56	1959-60	24,684.59	9,428.29	4 6,687.12	
Helix Watson Ranch Annexation	2-20-59	550.00	1958-59	1958-59	0	550.00	cash 0	
Helix Fletcher Annexation	6-26-59	200.00	1958-59	1958-59	0	200.00	cash 0	
Otay M.W.D.	10-26-56	24,900.00	1957-58	1961-62	4,910.35	4,976.33	15 15,013.32	
Poway M.W.D.	4-21-54	10,400.00	1955-56	1959-60	6,339.97	2,222.54	8 1,837.49	
Rainbow M.W.D.								
Annexation of 1958	5-12-59	3,500.00	1960-61	1969-70	0	0	0 3,500.00	
Ramona M.W.D.	8-27-57	41,900.00	1958-59	1962-63	0	8,625.10	20 33,274.90	
Annexation of 1958	5-29-59	6,600.00	1960-61	1969-70	0	0	0 6,600.00	
Rio San Diego (not including Lakeside I.D.)	6-7-56	46,100.00	1957-58	1961-62	9,237.07	9,814.37	11 27,048.56	
San Diego I.D.	12-13-48	13,733.00	1949-50	1958-59	13,060.20	672.80	cash 0	
Santa Fe I.D.	12-13-48	11,541.00	1949-50	1958-59	11,304.78	236.22	cash 0	
Valley Center M.W.D.	5-9-55	23,600.00	1956-57	1960-61	9,688.43	4,770.36	12 9,141.21	
Total		\$591,550.00			\$383,895.54	\$69,740.33		\$137,714.13

TABLES

TABLE 24

**METROPOLITAN WATER DISTRICT ANNEXATION CHARGES,
ASSESSMENTS AND BALANCES ON AUTHORITY AREAS**

Member Agencies	Date of Annexation	Amount of Special Assessments		Special Assessments to 6/30/58	Fiscal Year 1958-59		Remaining Balance of Annexation Fee 6/30/59
		Charge	First Year Last Year		Special Assessments	Tax Rate \$/100	
Annexation Charges Completed to June 30, 1958		\$ 60,909	1947-48 1976-77	\$ 60,909.00	—	—	0
Annexation Charges Outstanding as of June 30, 1958							
Chula Vista, City of	12-17-46	13,045,000	1947-48 1976-77	4,820,051.60	\$465,048.80	5	\$ 7,759,899.60
Fallbrook Public Utility District	6-11-54	1,072,230	1955-56 1984-85	107,949.67	55,089.37	11	929,190.96
Lakeside Irrigation District	6-16-54	548,100	1955-56 1984-85	55,282.73	18,095.19	7	474,722.08
Helix Irrigation District	10- 9-50	386,000	1951-52 1980-81	91,327.07	11,727.35	7	282,945.60
National City, City of							
Oceanside, City of							
San Diego, City of							
Bueno Colorado M.W.D.	8- 1-50	34,600	1951-52 1980-81	13,531.73	1,046.30	7	20,021.97
Carlsbad M.W.D.	11-24-58	50,400	1959-60 1988-89	0	0	0	50,400.00
Escondido, City of							
Fallbrook Public Utility District							
1950 Annexation							
1958 Annexation							
Helix Irrigation District							
Crest Public Utility Dist. Annexation	12-13-48	10,500	1949-50 1978-79	3,184.94	337.29	5	6,977.77
El Cajon Dry Island Annexation	12-20-54	327,450	1955-56 1984-85	33,526.47	11,851.86	5	282,271.67
Helix-Watson Ranch Annexation	2-20-59	8,730	1960-61 1989-90	0	0	0	8,730.00
Helix-Fletcher Annexation	6-26-59	2,675	1959-60 1959-60	0	0	0	2,675.00
Otay M.W.D.	10-26-56	273,000	1957-58 1986-87	9,119.21	12,573.60	24	251,307.19
Poway M.W.D.	4-21-54	91,800	1955-56 1984-85	9,363.23	3,064.25	11	79,372.54
Rainbow M.W.D.	4-10-54	167,700	1955-56 1984-85	17,131.98	5,301.19	12	145,266.83
1958 Annexation	5-12-59	24,300	1960-61 1989-90	0	0	0	24,300.00
Ranona M.W.D.	8-27-57	339,000	1958-59 1987-88	0	11,643.89	27	327,356.11
1958 Annexation	5-29-59	42,330	1960-61 1989-90	0	0	0	42,330.00
Rincon del Diablo M.W.D.	6-14-54	757,200	1955-56 1984-85	77,330.63	24,995.35	14	653,874.02
Rio San Diego M.W.D.							
(not including Lakeside I.D.)	6- 7-56	375,980	1957-58 1986-87	13,085.85	9,188.44	14	551,705.71
San Diego Irrigation District	12-13-48	187,100	1949-50 1978-79	56,630.93	6,057.69	5	124,411.38
Santa Fe Irrigation District	12-13-48	167,000	1949-50 1978-79	50,524.25	5,200.85	4	111,274.90
South Bay Irrigation District							
(not including City of Chula Vista)	11- 3-52	449,370	1955-54 1982-83	75,440.41	14,791.79	7	339,137.80
Valley Center M.W.D.	5- 9-55	205,680	1956-57 1985-86	14,059.68	6,759.18	17	184,881.14
Total		\$18,625,054		\$5,508,229.38	\$642,772.35		\$12,474,052.27

TABLES

**TABLE 25
WATER SALES BY METROPOLITAN WATER DISTRICT
Fiscal Years 1941-42 to 1958-59**

Year	To Member Municipalities							
	Natural Water		Softened Water		Total to Agencies	To Others	Total	
	Acre feet	Per cent	Acre feet	Per cent	Acre feet	Acre feet	Acre feet	
1941-42	0	0	9,372.6	100	9,372.6	70.7	9,443.3	
1942-43	0	0	14,457.8	100	14,457.8	2,626.4	17,084.2	
1943-44	0	0	15,874.9	100	15,874.9	3,301.8	19,176.7	
1944-45	0	0	30,591.3	100	30,591.3	1,715.7	32,307.0	
1945-46	0	0	46,685.8	100	46,685.8	1,264.2	47,950.0	
1946-47	0	0	59,861.8	100	59,861.8	524.0	60,385.8	
1947-48	41,093.5	36	71,995.4	64	113,088.9	116.8	113,255.7	
1948-49	71,642.6	49	73,237.1	51	144,879.7	128.4	145,008.1	
1949-50	69,308.0	49	72,936.0	51	142,244.0	23,371.6	165,615.6	
1950-51	75,000.9	54	63,493.1	46	138,494.0	26,978.6	165,472.6	
1951-52	66,674.3	44	84,616.1	56	151,290.4	42,464.2	193,754.6	
1952-53	30,845.3	24	99,589.6	76	130,434.9	31,682.4	162,117.3	
1953-54	120,773.0	51	115,550.6	49	236,323.6	7,820.7	244,144.3	
1954-55	192,544.7	59	134,923.3	41	327,468.0	58,184.5	385,652.5	
1955-56	190,337.2	53	169,506.4	47	359,843.6	45,562.9	405,406.5	
1956-57	286,059.1	60	191,110.7	40	477,169.8	66,074.1	543,243.9	
1957-58	266,024.1	57	197,900.0	43	463,924.1	75,612.8	539,536.9	
1958-59	244,354.2	46	282,248.1	54	526,602.3	74,494.3	601,096.6	

WATER PRODUCTION—METROPOLITAN WATER DISTRICT CONSTITUENT AREAS
 Figures Furnished by Metropolitan Water District

Constituent Areas	Total Water Production			Source of Water Produced—1958-59		
	1957-58	1958-59	Per cent	M.W.D.		Other
	Amount ac. ft.	Amount ac. ft.	Increase or Decrease	Amount ac. ft.	Per cent of Total	Amount ac. ft.
Anaheim	12,711	16,166	27.2	4,468	27.6	11,698
Beverly Hills	11,375	11,869	4.3	2,722	22.9	9,147
Burbank	22,300	24,415	9.5	3,849	15.8	20,566
Central Basin M.W.D.	173,131	201,043	16.1	6,624	3.3	194,419
Chino Basin M.W.D.	143,852	138,078	- 4.0	4,364	3.2	133,714
Coastal M.W.D.	12,120	13,704	13.1	11,803	86.1	1,901
Compton	6,873	7,546	9.8	178	2.4	7,368
Eastern M.W.D.	138,107	152,507	10.4	28,701	18.8	123,806
Foothill M.W.D.	13,423	15,732	17.2	8,258	52.5	7,474
Fullerton	12,173	14,237	17.0	7,810	54.9	6,427
Glendale	22,667	23,179	2.3	1,807	7.8	21,372
Long Beach	41,298	47,470	14.9	18,548	39.1	28,922
Los Angeles	463,731	511,506	10.3	82,817	16.2	428,689
Orange County M.W.D.	193,102	201,505	4.4	19,205	9.5	182,300
Pasadena	28,811	32,744	13.7	16,322	49.8	16,422
Pomona Valley M.W.D.	42,506	45,842	7.8	6,444	14.1	39,398
San Diego C.W.A.	174,214	187,839	7.8	102,779	54.7	85,060
San Marino	4,417	5,187	17.4	0	0	5,187
Santa Ana	11,999	14,647	22.1	7,102	48.5	7,545
Santa Monica	13,707	14,897	8.7	14,020	94.1	877
Torrance	14,661	15,837	8.0	14,913	94.2	924
West Basin M.W.D.	104,546	119,654	14.5	65,274	54.6	54,380
Western M.W.D.	155,058	154,578	- 0.3	6,278	4.1	148,300
Totals	1,816,782	1,970,182	8.4	434,286	22.0	1,535,896

(a) Exclusive of 81,327.5 acre feet delivered to Los Angeles County Flood Control District for recharging underground basins.
 (b) Exclusive of 81,710.0 acre feet delivered to Orange County for recharging underground basins, but including 19,204.7 acre feet delivered for irrigation and domestic use.
 (c) Includes 4,349.9 acre feet of softened water placed in underground basins.
 (d) Includes Colorado River water stored by Authority member agencies in previous years.
 (e) Includes 5,803.5 acre feet of tunnel seepage.

TABLE 27
ASSESSED VALUATIONS AND TAX RATES OF THE
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Fiscal Year	Area (acres)	Assessed Valuations Total (1)	Tax Rate	
			Per \$100 Secured	Per \$100 Unsecured
1929-30	—	\$ 2,439,836,920	\$0.04	\$0.00
1930-31	—	2,431,684,250	.03	.04
1931-32	—	2,382,184,445	.03	.03
1932-33	—	1,936,051,180	.04	.03
1933-34	—	1,654,403,890	.04	.04
1934-35	—	1,587,147,565	.10	.04
1935-36	—	1,783,531,020	.20	.10
1936-37	—	1,789,160,685	.37	.20
1937-38	—	1,827,765,725	.40	.37
1938-39	—	1,896,966,255	.40	.40
1939-40	—	1,910,152,190	.42	.40
1940-41	389,588	1,841,248,450	.49	.42
1941-42	399,875	1,900,599,934	.48	.49
1942-43	400,614	2,001,924,735	.48	.48
1943-44	401,190	2,005,496,430	.48	.48
1944-45	401,536	2,109,192,795	.48	.48
1945-46	402,779	2,159,731,425	.50	.48
1946-47	501,425	2,413,186,570	.48	.50
1947-48	546,573	3,443,212,822 (2)	.35	.48
1948-49	578,368	3,883,081,225	.34	.35
1949-50	585,184	4,181,812,855	.34	.34
1950-51	721,850	4,281,519,725	.31	.34
1951-52	995,130	4,674,664,040	.30	.31
1952-53	1,120,448	5,372,498,515	.28	.30
1953-54	1,368,038	6,015,691,980	.25	.28
1954-55	1,793,651	6,548,392,114	.23	.25
1955-56	1,876,256	8,514,868,335	.21	.23
1956-57	1,932,205	9,674,000,560	.19	.21
1957-58	2,046,189	11,235,906,510	.18	.19
1958-59	2,128,333	12,070,838,070	.18	.18
1959-60	—	12,714,205,470	.17	.18

- (1) Includes secured, unsecured, and public utility valuations.
 (2) First year in which Authority assessed valuation was included in district's assessed valuation.
 (3) Data for 1959-60 were available before completion of report and are included for convenience of reader.