

SAN DIEGO  
COUNTY WATER AUTHORITY



THIRTY-EIGHTH ANNUAL REPORT  
1984

SAN DIEGO COUNTY WATER AUTHORITY

Organized June 9, 1944

# Thirty-Eighth Annual Report

of Authority Operations  
for Fiscal Year Ending June 30, 1984

Lawrence R. Michaels  
*General Manager and Chief Engineer*

SAN DIEGO, CALIFORNIA  
1984

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**SAN DIEGO COUNTY WATER AUTHORITY**  
*Member Agencies, Date of Entry and  
 Representative on Board of Directors on June 30, 1984*

**CITIES**

- Del Mar ..... Nov. 23, 1962  
James A. Ferrara
- Escondido ..... Oct. 9, 1950  
Robert M. Dodd
- National City ..... June 9, 1944  
Tom Crownover
- Oceanside ..... June 9, 1944  
David Rorick, Jr.
- Poway ..... April 21, 1954  
Alan D. Archibald
- San Diego ..... June 9, 1944  
Craig S. Andrews, Dr. Charles F. Cooper, Janet Erickson, Lawrence Hirsch,  
Francesca M. Krauel, Roy W. Lessard, Michael D. Madigan, Paul A.  
Peterson, Dr. Alice C. Tang, John P. Starkey

**WATER DISTRICTS**

- Helix ..... June 9, 1944  
Nat L. Eggert, Harry Griffen
- Otay ..... Oct. 26, 1956  
Milton R. Emerson
- San Dieguito ..... Dec. 13, 1948  
Laena Dashiell

**IRRIGATION DISTRICTS**

- Santa Fe ..... Dec. 13, 1948  
John M. Cranston
- South Bay ..... Nov. 3, 1952  
Lloyd L. Lee

*(Includes City of Chula Vista, an independent member agency,  
 from June 9, 1944 to November 3, 1952)*

**MUNICIPAL WATER DISTRICTS**

- Bueno Colorado ..... June 11, 1954  
Hans H. Doe
- Costa Real ..... June 16, 1954  
Fred W. Maerke
- De Luz Heights ..... June 28, 1967  
George F. Yackey
- Olivenhain ..... July 25, 1960  
Howard G. Golem
- Padre Dam ..... June 7, 1956  
W. E. Klostermann

*(Includes Lakeside I.D., an independent member agency,  
 from June 9, 1944 to June 7, 1956)*

- Rainbow ..... April 10, 1954  
John H. Fox
- Ramona ..... August 27, 1957  
Harold J. Schachter
- Rincon del Diablo ..... June 14, 1954  
Sherwood D. Anderson
- Valley Center ..... May 9, 1955  
John F. Hennigar
- Yuima ..... Dec. 16, 1963  
F. D. Fitzsimmons

**PUBLIC UTILITY DISTRICT**

- Fallbrook ..... June 9, 1944  
Gordon W. Tinker

**FEDERAL AGENCY**

- Pendleton Military Reservation ..... Dec. 16, 1977  
Paul L. V. Campo

**COUNTY WATER DISTRICT**

- San Marcos ..... Feb. 25, 1980  
Dale Mason

**OFFICERS OF BOARD OF DIRECTORS  
 1983-84**



**Chairman  
 ROY W. LESSARD**  
*San Diego  
 5-73 to 6-84*



**Vice Chairman  
 NAT L. EGGERT**  
*Helix Water District  
 10-77 to 6-84*



**Secretary  
 FRANCESCA M. KRAUEL**  
*San Diego  
 8-78 to 6-84*

**EXECUTIVE OFFICERS**



**LAWRENCE R. MICHAELS**  
*General Manager and  
 Chief Engineer*



**PAUL D. ENGSTRAND**  
*General Counsel*

**ADMINISTRATIVE STAFF**



**B. L. OGDEN**  
*Assistant Chief  
 Engineer*



**HENRY LOZANO**  
*Director of Finance  
 and Treasurer*



**I. E. NICHOLS**  
*Superintendent*



**JANET RAVIART**  
*Executive Secretary*

**BOARD OF DIRECTORS  
1983-84**  
*For Officers, See Page 4*



**S. D. ANDERSON**  
*Rincon Del Diablo  
Municipal Water District  
8-78 to 6-84*



**CRAIG S. ANDREWS**  
*San Diego  
5-83 to 6-84*



**ALAN D. ARCHIBALD**  
*City of Poway  
10-82 to 6-84*



**PAUL L. V. CAMPO**  
*Pendleton Military  
Reservation  
1-78 to 6-84*



**DR. CHARLES F. COOPER**  
*San Diego  
4-73 to 6-84*



**JOHN M. CRANSTON**  
*Santa Fe  
Irrigation District  
10-64 to 6-84*



**TOM CROWNOVER**  
*National City  
6-76 to 6-84*



**LAENA DASHIELL**  
*San Dieguito  
Water District  
1-78 to 6-84*



**ROBERT M. DODD**  
*Escondido  
1-70 to 6-84*



**HANS H. DOE**  
*Buena Colorado  
Municipal Water District  
6-54 to 6-84*



**MILTON R. EMERSON**  
*Otay  
Water District  
12-81 to 6-84*



**JANET ERICKSON**  
*San Diego  
2-74 to 6-84*



**JAMES A. FERRARA**  
*City of Del Mar  
9-83 to 6-84*



**F. D. FITZSIMMONS**  
*Yuima Municipal  
Water District  
8-71 to 6-84*



**JOHN H. FOX**  
*Rainbow Municipal  
Water District  
12-82 to 6-84*



**HOWARD G. GOLEM**  
*Olivenhain Municipal  
Water District  
1-62 to 6-84*

**BOARD OF DIRECTORS  
1983-84**  
*(Continued)*



**HARRY GRIFFEN**  
*Helix  
Water District  
7-56 to 6-84*



**JOHN F. HENNIGAR**  
*Valley Center  
Municipal Water District  
10-76 to 6-84*



**LAWRENCE HIRSCH**  
*San Diego  
5-73 to 6-84*



**W. E. KLOSTERMANN**  
*Padre Dam Municipal  
Water District  
2-83 to 6-84*



**LLOYD L. LEE**  
*South Bay  
Irrigation District  
4-61 to 6-84*



**MICHAEL D. MADIGAN**  
*San Diego  
5-79 to 6-84*



**FRED W. MAERKLE**  
*Costa Real Municipal  
Water District  
11-78 to 6-84*



**DALE MASON**  
*San Marcos  
County Water District  
3-80 to 6-84*



**PAUL A. PETERSON**  
*San Diego  
6-83 to 6-84*



**DAVID RORICK, JR.**  
*Oceanside  
8-73 to 6-84*



**HAROLD J. SCHACHTER**  
*Ramona Municipal  
Water District  
1-83 to 6-84*



**JOHN P. STARKEY**  
*San Diego  
10-75 to 6-84*



**DR. ALICE C. TANG**  
*San Diego  
10-79 to 6-84*



**GORDON W. TINKER**  
*Fallbrook Public  
Utility District  
4-83 to 6-84*



**WILLIAM TRIPP**  
*City of Del Mar  
8-80 to 9-83*



**GEORGE F. YACKEY**  
*De Luz Heights  
Municipal Water District  
6-68 to 6-84*

**DIRECTORS REPRESENTING SDCWA ON METROPOLITAN WATER DISTRICT  
BOARD OF DIRECTORS**



**JOHN M. CRANSTON**  
12-74 to 6-84



**HANS H. DOE**  
7-59 to 6-84



**HARRY GRIFFEN**  
1-63 to 6-84



**FRANCESCA M. KRAUEL**  
10-83 to 6-84



**MICHAEL D. MADIGAN**  
7-82 to 6-84



**JOHN P. STARKEY**  
1-81 to 6-84

**COMMITTEES OF THE BOARD**  
June 30, 1984

**ADMINISTRATIVE POLICY**

David Rorick, Jr., Chairman  
Laena Dashiell, Vice Chairman  
Alan D. Archibald  
Tom Crownover  
Robert M. Dodd  
James A. Ferrara  
Lloyd L. Lee  
Fred W. Maerke  
Alice C. Tang  
Gordon W. Tinker  
George F. Yackey

**FISCAL POLICY**

Dale Mason, Chairman  
Howard G. Golem, Vice Chairman  
Craig S. Andrews  
Alan D. Archibald  
John M. Cranston  
Hans H. Doe  
Nat L. Eggert  
James A. Ferrara  
F. D. Fitzsimmons  
John H. Fox  
Harold J. Schachter  
John P. Starkey

**ENGINEERING AND OPERATIONS**

Sherwood D. Anderson, Chairman  
F. D. Fitzsimmons, Vice Chairman  
Paul L. V. Campo  
Milton R. Emerson  
Howard G. Golem  
W. E. Klostermann  
Lloyd L. Lee  
Fred W. Maerke  
Harold J. Schachter  
George F. Yackey

**PUBLIC INFORMATION**

John P. Starkey, Chairman  
Michael D. Madigan, Vice Chairman  
Sherwood D. Anderson  
Tom Crownover  
Laena Dashiell  
Janet Erickson  
Lawrence Hirsch  
W. E. Klostermann  
Francesca M. Krauel  
Dale Mason  
David Rorick, Jr.

**LONG RANGE PLANNING**

Lawrence Hirsch, Chairman  
Charles F. Cooper, Vice Chairman  
Paul L. V. Campo  
Robert M. Dodd  
Milton R. Emerson  
Janet Erickson  
Harry Griffen  
John F. Hennigar  
Michael D. Madigan  
Paul A. Peterson  
Alice C. Tang  
Gordon W. Tinker

**WATER POLICY**

Hans D. Doe, Chairman  
John F. Hennigar, Vice Chairman  
Craig S. Andrews  
Charles F. Cooper  
John M. Cranston  
Nat L. Eggert  
John H. Fox  
Harry Griffen  
Francesca M. Krauel  
Michael D. Madigan  
Paul A. Peterson



# San Diego County Water Authority

2750 Fourth Avenue, San Diego, California 92103 (619) 297-3218

(A Public Agency Organized June 9, 1946)

Neil L. Eggen, Chairman  
 Francisco M. Kikau, Vice Chairman  
 Dale Mason, Secretary  
 Lawrence R. Michaels, General Manager  
 and Chief Engineer  
 Paul D. Engstrand, General Counsel

March 1, 1985

## Board of Directors San Diego County Water Authority

June 9, 1984 marked the fortieth anniversary of the organization of the Water Authority. This Thirty-eighth Annual Report covers the activities of the Water Authority during fiscal year ending June 30, 1984.

The winter rainfall of 1983-84 was about 60% of normal throughout the County with the January - June rainfall being the least in recorded history for that period. Water deliveries by the Authority were up by 24% over the previous year. The water in storage on June 30, 1984 was 393,349 acre feet, 73% of June 30, 1983 total.

Work continued on a number of capital improvements that will enhance the reliability of the Authority's water delivery system. The second phase of Pipeline 3 rehabilitation was completed with 8,763 feet of steel liners installed. Contracts were awarded for equipment and construction of the Miramar and Alvarado hydroelectric power plants. A contract for Pipeline 4A was awarded to increase the raw water capacity to Miramar Filtration Plant. Design was completed for the third and final phase of Pipeline 3 rehabilitation, modifications to the crossover pipeline to accommodate higher flows, and the preliminary design report on Pamo Dam completed. The final EIR on the Pamo project was filed in April 1984.

The retirement of Mr. Linden R. Buzzell after twenty years as General Manager and Chief Engineer of the Authority was a major change. The loss of his extensive background and experience was felt during the latter part of the year even though he continued to be available for consultation on important matters.

The Water Authority's financial position remains strong, and the staff feels that with resourceful planning the Authority can meet its water demands through the 1990's.

Very truly yours,

*Lawrence R. Michaels*  
 Lawrence R. Michaels  
 General Manager and Chief Engineer

### MEMBER AGENCIES

- |                                                                                           |                                                     |                                                |                                                                                                                                                         |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CITIES</b><br>*Del Mar *National City *Poway<br>*Rancho Santa Fe *Oceanside *San Diego | <b>IRRIGATION DISTRICTS</b><br>*Santa Fe *South Bay | <b>COUNTY WATER DISTRICT</b><br>*San Marcos    | <b>MUNICIPAL WATER DISTRICTS</b><br>*Buena Colorado *Ramona<br>*Costa Real *Ramona<br>*De Luz Heights *Valley Center<br>*Olivewood *Yuma<br>*Palo Verde |
| <b>WATER DISTRICTS</b><br>*Helen *Clay<br>*San Diego                                      | <b>PUBLIC UTILITY DISTRICT</b><br>*Fallbrook        | <b>MILITARY RESERVATION</b><br>*Camp Pendleton |                                                                                                                                                         |

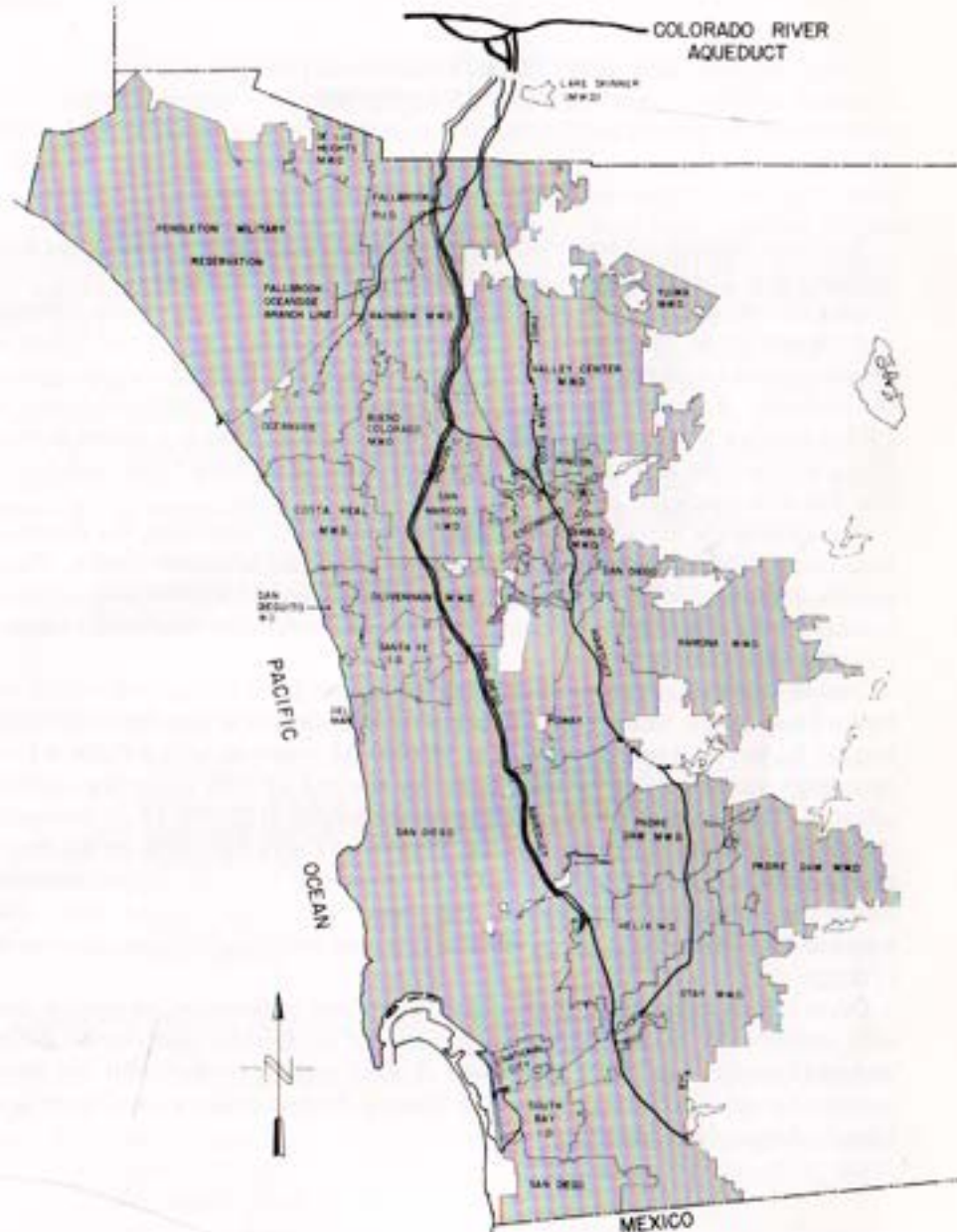


Figure A. Authority Area Within San Diego County

**SAN DIEGO COUNTY WATER AUTHORITY  
REPORT OF ACTIVITIES**

**FISCAL YEAR 1983-84**

San Diego depends on imported water for about 90 percent of its water needs in normal years. The San Diego County Water Authority, even under the most challenging circumstances, has been able to import enough water to meet the demand.

Prospects for an adequate future supply of water are less certain and failure to improve the delta transfer capability of the State Water Project is at the root of the problem. Accepting the electorate's opposition to the Peripheral Canal in 1982, Governor Deukmejian proposed a "through delta" plan as a second choice. This plan could be developed more rapidly than the Peripheral Canal and at less cost but with much less capacity.

Recognizing the impact and likelihood of future water shortages, the Board of Directors has supported new approaches to obtain an adequate supply. These include additional local water storage, possible contracts for short term supplies not needed by others at the present time and other prospects that would supplement potable water supplies.

Two of the storage projects advanced during the year. Design was started on Pamo Dam on the Santa Ysabel Creek after adoption of a first Environmental Impact Report on April 12, 1984. The 130,000 AF reservoir with 100,000 AF of emergency storage would be operational by the end of 1986 under the existing schedule. The Board of Directors approved the leasing of 20,000 AF of storage in the proposed Santa Margarita Project. This project with two dams on the Santa Margarita River and a total of 176,000 AF of storage is a joint project between Fallbrook Public Utilities District and Camp Pendleton Marine Base. The schedule for completion is not certain due to a need for Congressional approval of findings.

Other efforts being pursued are conservation and reclamation, in conjunction with groundwater basins. Conservation plans for all member agencies are being updated to meet new State guidelines. A Reclamation project with the most promise for early acceptance is the San Pasqual Project utilizing the City of San Diego's Aquaculture process.

## BOARD OF DIRECTORS

### General

The San Diego County Water Authority is comprised of 24 member agencies. Each member agency is represented by at least one person. A member agency is entitled to one additional representative for each full five percent of total assessed valuation contained within its boundaries. Assessed valuation is determined by the County of San Diego's Assessor's Office. These representatives are appointed by the chief executive officer of the respective agencies with approval by the agencies' governing bodies. During the year, only two agencies were represented by more than one representative: The City of San Diego by ten; Helix Water District by two. Directors serve without pay from the Authority.

Officers of the Board of Directors are elected in July of even-numbered years. In July 1982, Roy W. Lessard was elected Chairman; Nat L. Eggert, Vice Chairman; and Francesca M. Krauel, Secretary.

To facilitate matters, most business coming before the Board is first considered by one of its committees. Each committee then reports to the full Board which makes the necessary decisions. There are six standing committees:

Administrative Policy	Long Range Planning
Engineering and Operations	Public Information
Fiscal Policy	Water Policy

During fiscal year 1983-84, Directors were presented with service emblems as follows:

<u>Director</u>	<u>Length of Service</u>
George F. Yackey	15 years
Lawrence Hirsch	10 years
David Rorick, Jr.	10 years
Nat L. Eggert	6 years
Joseph Parker	6 years
Dale Mason	3 years

During the year the following Directors were seated or reseated:

<u>Date</u>	<u>Director</u>	<u>Agency</u>	<u>Term Expires</u>
Aug. 11	Tom Crownover	National City	July 15, 1989
Sept. 8	Nat L. Eggert	Helix Water Dist.	Aug. 18, 1989
	James Ferrara	City of Del Mar	March 3, 1987
	(replaces William H. Tripp)		
Jan. 12	Paul L. V. Campo	Camp Pendleton	Jan. 12, 1990
March 8	Milton R. Emerson	Otay Water Dist.	Sept. 10, 1989
April 12	Alan D. Archibald	City of Poway	April 22, 1990
	John F. Hennigar	Valley Center MWD	Jan. 13, 1990

**Significant Board Actions****July 14, 1983**

Resolution: Authorized a five-year storage agreement with the City of San Diego.

Motion: Adopted recommendation of consultant Phillips-Ramsey for the 1983-84 Public Awareness Program.

**August 11, 1983**

Resolution: Awarded contract for Pipeline 3 rehabilitation to firm of Vido Artukovich & Son and appropriated an additional \$1,770,000 from the General Fund.

Resolution: Set the tax levy for 1983-84 fiscal year at .700¢ per \$100 of assessed valuation.

**October 13, 1983**

Resolution: Amended the Administrative Code allowing the hiring of a non-engineer General Manager.

Resolution: Granted Jackson Drive, a public street, to the City of San Diego.

Resolution: Appropriated \$2,240,000 from the Capital Outlay Fund for turbines, generators, and related equipment for the Miramar and Alvarado Hydroelectric Facilities.

Resolution: Appointed Francesca M. Krauel to the Metropolitan Water District Board of Directors filling a new and sixth position.

**November 17, 1983**

Resolution: Accepted the Draft Environmental Impact Report and Environmental Assessment for the Pamo Project and authorized public hearing.

Resolution: Authorized execution of contract for water services to Fallbrook Annex, Naval Weapons Station, Seal Beach.

**December 15, 1983**

Motion: Reappointed Peat, Marwick, Mitchell & Co. as Authority auditors and to seek proposals from other firms for 1984-85 fiscal year.

Motion: Approved new policy on annexation fees and established \$238.00 per acre foot effective January 1, 1984 and an eight percent annual increase.

**January 12, 1984**

Resolution: Approved revision to Pamo Dam Work Order appropriating \$710,000 from the Capital Outlay Fund.

**February 9, 1984**

Resolution: Authorized call for bids for Crossover Pipeline Modification and appropriated \$440,000 from Capital Outlay Fund.

Resolution: Authorized call for bids for Pipeline 4A and appropriated \$3,075,000 from the Capital Outlay Fund.

Resolution: Appointed John P. Starkey as member, and John M. Cranston as alternate member of the Colorado River Board.

**February 23, 1984**

Motion: Hired Lawrence R. Michaels as General Manager and Chief Engineer.

Resolution: Honored Linden R. Burzell upon his retirement after twenty years of service as General Manager and Chief Engineer.

**April 12, 1984**

Resolution: Certified completion of the Final Environmental Impact Report and Environmental Assessment for Pamo Reservoir Project. This was followed by a public hearing.

Resolution: Found significant environmental effects of the proposed Pamo Reservoir Project and adopted a statement of overriding consideration.

Resolution: Approved the Pamo Reservoir Project.

Resolution: Authorized the execution of an agreement in the amount of \$1,353,000 with DVY Construction Company for the Miramar and Alvarado hydroelectric power-generating facilities; authorized additional tasks by engineering consultant CH2M-Hill in the amount of \$255,000, and appropriated \$1,572,000 from the Capital Outlay Fund.

Resolution: Authorized execution of a contract with Dames & Moore for the final design of Pamo Dam and appropriated an additional \$1,243,900 for this project from the Capital Outlay Fund.

Motion: Established the Authority's treated water rate at \$38.00 per acre foot beginning July 1, 1984.

May 10, 1984

- Motion: Approved the final phase of the Pipeline 3 rehabilitation and appropriated an additional \$726,000 to the work order.
- Resolution: Authorized the execution of a contract with L. H. Woods & Sons, Inc. for Pipeline 4A at \$2,248,640.
- Resolution: Authorized participation in the ACWA/JPIA Self-Insured Workers' Compensation Program.
- Resolution: Gave conceptual approval to terms and conditions for financial participation by the Authority in the Santa Margarita Project.

**Administration**

**Executive Officers**

- Lawrence R. Michaels    General Manager and Chief Engineer
- Linden R. Burzell        (Until January, 1984)
- Paul D. Engstrand        General Counsel

**Administrative Staff**

- Buckley L. Ogden        Assistant Chief Engineer
- Henry G. Lozano        Director of Finance
- Irwin E. Nichols        Superintendent
- Pete Rios                Government/Community Affairs Officer
- Janet M. Raviart        Executive Secretary

Administrative offices of the Authority are located at 2750 Fourth Avenue, San Diego. Field headquarters are at the Fred A. Heilbron Operations Center, 610 West Fifth Avenue, Escondido.

**EMPLOYEE RELATIONS**

On June 30, 1984 the Authority had 45 employees. Fourteen were employed in the San Diego office and 31 worked out of the Fred A. Heilbron Operations Center in Escondido. The longevity of the employees is as follows:

<u>Years of Service</u>	<u>Number of Employees</u>
over 25	4
over 20	2
over 15	13
over 10	8
over 5	5
under 5	13

The Authority is a member of the Public Employees Retirement System of the State of California. Contributions to the system are made by the employee and the Authority, and the plan is coordinated with Social Security. The basic formula provides for retirement at age 60 based upon 2% of the highest annual salary for each year of service. Social Security benefits will be received as well.



Other benefits the employees receive are a Blue Cross administered health plan, a California Dental Service dental plan, and a long-term disability plan with up to \$50,000 in life insurance.

The Administrative Code provides for vacation leaves of twelve working days for the first five years of service and increases to 20 days of vacation after 20 years of service. The Authority recognizes eleven paid holidays each year. Sick leave is granted on the basis of twelve days per year of service and can be accumulated. The Code provides for partial payment of unused sick leave upon retirement.

The employees, through their Employee Association, express their position as to salaries, fringe benefits and working conditions. The Association organizes a summer picnic, a Christmas party and other occasional functions for the employees.

# WATER AUTHORITY COMPOSITION

## General

The San Diego County Water Authority consists of six cities, three water districts, two irrigation districts, ten municipal water districts, one public utility district, one federal agency, and one county water district. It was organized on June 9, 1944 under the "County Water Authority Act" of 1943. The act was requested by San Diego City and County officials, prepared by Phil D. Swing, and introduced by Senator Ed Fletcher. The measure was approved by the Governor on May 17, 1943.

The original incorporators of the Water Authority were the City of Chula Vista, City of Coronado, City of National City, City of Oceanside, City of San Diego, Fallbrook Public Utility District, Lakeside Irrigation District, La Mesa, Lemon Grove and Spring Valley Irrigation District, and Ramona Irrigation District.

Such an organization was needed for the prime purpose of importing Colorado River water to San Diego in order to replace the local water supplies which were rapidly becoming inadequate.

## Area

The Authority encompasses 902,224 acres (1,409.7 square miles), a net increase of 2646 acres during the fiscal year.

Area changes, addition of member agencies, and percentage of area each member agency serves are contained in Table 3. The City of San Diego is the largest area with 206,175 acres; the smallest area is the City of Del Mar consisting of 1,159 acres.

Each calendar year the Authority is required by state law to file a Statement of Change of Boundary. This statement was filed with Metropolitan Water District, the San Diego County Assessor, and the State Board of Equalization on December 30, 1983.

The statement for calendar year 1983 contained several annexations and detachments which changed the Authority and MWD boundary, in addition to annexations and detachments that affected the area of the Authority's member agencies.

The Statement of Change of Boundary is used by the County Assessor to determine the total assessed valuation within each member agency and the Authority for tax purposes.

## Population

The population of San Diego County on June 30, 1984 was estimated to be 2,040,888 people of which 98 percent live within the Authority service area. The average annual growth rate within the Authority service area for the period from

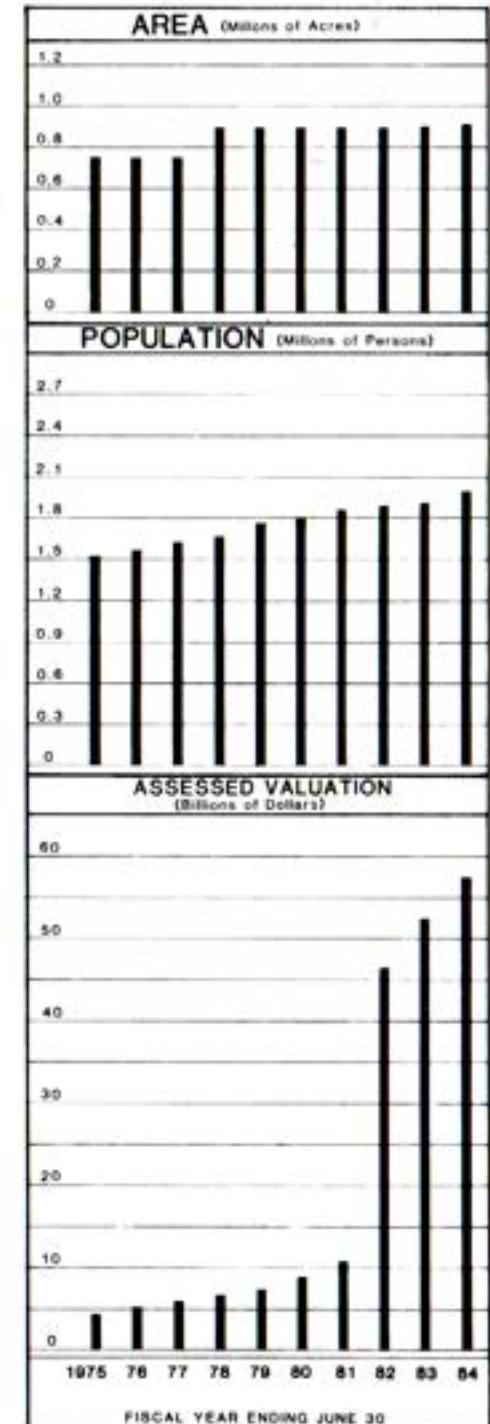
1946 to 1984 was 4.13 percent. The population within the Authority service area was estimated to be 2,006,239 persons on June 30, 1984, an increase of 71,652 or 3.7 percent from the June 30, 1983 estimate of 1,934,587. Population statistics are contained in Table 2 and Table 3.

The City of San Diego, largest member agency of the Authority in area, leads the member agencies in population with 958,900 persons, approximately 48 percent of the Authority total. De Luz Heights Municipal Water District has the smallest population with 250 persons and the lowest density with 0.02 persons per acre. The highest average population density within an identifiable political entity is 9.10 persons per acre in the City of La Mesa.

The average population density of the Authority increased during the fiscal year from 2.15 to 2.22 persons per acre or 1,423 persons per square mile.

## Assessed Valuation

The assessed valuation of taxable property within the Authority, both secured and unsecured, and the Authority's debt service requirements provide the basis for the annual determination of the Authority tax rate by the Board of Directors. The number of directors and the number of votes to which each member agency is entitled are determined by the total assessed valuation within each member agency. The valuations are determined by the San Diego County Assessor who collects these taxes for the Authority.



Total assessed valuation of taxable property within the Authority for 1983-84, according to the County Auditor's certification, was \$57,524,061,587, an increase of \$4,745,136,701 or 9.0 percent from the 1982-83 certified valuation of \$52,778,924,886.

The average assessed valuation of property within the Authority service area increased from \$58,671 per acre in 1982-83 to \$63,758 per acre in 1983-84. This increase was the result of higher value of secured and unsecured property in the Authority service area.

The assessed valuation for each member agency, the Authority, and San Diego County are contained in Table 5.

## WATER SUPPLY AND CONSUMPTION

### Source

The Metropolitan Water District of Southern California (MWD) is the sole source of supplemental water to the Authority and provides an average of 90% of its water. The member agencies of the Water Authority used approximately 25.7 percent of MWD's supply in 1983-84. The Authority has a preferential right to 10.74 percent of MWD's total supply, but MWD has never invoked preferential rights as a basis for curtailment of water deliveries.

### MWD Facilities

Metropolitan Water District supplies a blend of Colorado River water and State Project water. Water from the Colorado River is diverted at Lake Havasu and is carried through the Colorado River Aqueduct to the terminus at Lake Mathews in Riverside County. Supplies for San Diego are diverted from the aqueduct near the west portal of the San Jacinto Tunnel into the First San Diego Aqueduct (Pipelines 1 and 2). A few miles west, the San Diego Canal receives water from the Casa Loma Canal. Pipelines 1 and 2 enter and traverse San Diego County without going through any other major facilities.

The State Water Project water is delivered to MWD at Lake Perris, terminus of the 444-mile California Aqueduct. From there, it flows through the Lakeview Pipeline to the San Diego Canal into Lake Skinner. A portion of the water from Lake Skinner flows directly into Pipelines 3 and 5 while another portion is processed through the Skinner Filtration Plant before entering Pipeline 4. By the end of June 1984, the blend in Lake Skinner was 79 percent Colorado River water and 21 percent State Water Project water.

Lake Skinner is the major storage facility for the San Diego Aqueducts with a maximum capacity of 44,000 acre feet of storage. The facilities are located in Riverside County south of Winchester. The maximum water elevation for storage is 1,479 feet above sea level. The Skinner Treatment Plant, located at the reservoir, has a treatment capacity of 240 million gallons per day (mgd) and is being expanded to 340 mgd.

### Authority Facilities

The Authority takes delivery of water from MWD in the five pipelines of the San Diego Aqueducts approximately six miles south of the Riverside-San Diego County line.

San Vicente Reservoir, which is owned and operated by the City of San Diego, is the terminus of the First Aqueduct. The Fallbrook-Oceanside Branch originates from the First Aqueduct at Rainbow. The Authority operates and maintains approximately 12.5 miles of this branch from Rainbow to Morro Reservoir. The La Mesa-Sweetwater Branch extends from the First Aqueduct at Slaughterhouse Canyon through Lakeside and El Cajon to Sweetwater Reservoir. The two pipelines of the First Aqueduct share common tunnels and inverted siphons and are operated as a single unit.

The three pipelines of the Second Aqueduct (Pipelines 3, 4, and 5), although in common right of way for most of their length, do not share any facilities south of Lake Skinner and are operated separately. The treated water pipeline terminates in Lower Otay Reservoir. One untreated water pipeline ends at the City of San Diego's Alvarado Treatment Plant near Lake Murray. The terminus of Pipeline 5 is the crossover diversion structure at San Marcos. Pipeline 5 was placed in service on July 14, 1983.

To maximize the flexibility of the system, several crossover connections have been constructed in the last 20 years. One such facility is the pipeline from the Second Aqueduct at Twin Oaks Valley to the First Aqueduct just north of Escondido. This connection permits the refilling of the First Aqueduct with untreated water after agencies to the north have used a portion of its capacity.

Just upstream of the Twin Oaks Valley Diversion is an interconnection which permits the transfer of Pipeline 3 flows into Pipeline 4 and vice versa. Member agencies have also increased the flexibility of their operations by increasing the number of aqueduct pipelines to which they are connected.

Flows in the First Aqueduct are chlorinated at a station in Rainbow Pass just north of the Riverside-San Diego County line. Treated water is chlorinated during the treatment process at the Skinner Plant, and water in Pipeline 3 is chlorinated at the Rainbow Chlorination station.

The design capacities of the Authority pipelines at the point of delivery from the Metropolitan Water District are:

Pipeline 1 and 2 combined	196 cubic feet/second
Pipeline 3	250 cubic feet/second
Pipeline 4	380 cubic feet/second
Pipeline 5	450 cubic feet/second

One cubic foot equals 7.48 gallons. One cubic-foot per second flowing twenty-four hours will produce nearly two acre-feet. An acre-foot contains approximately 326,000 gallons.

No storage facilities are owned or operated by the Authority. However, it does have the contractual right to store up to 40,000 acre feet (af) in San Vicente

Reservoir, the terminus of the First Aqueduct. An agreement with the City of San Diego, which owns the reservoir, provides for payment to the City of San Diego in the amount of \$2.20 per af for the maximum amount of water in storage each year. In addition, the Authority pays the City of San Diego \$4.00 per af for pumping water from storage into the City's system. The agreement also provides that the first water which may be lost over the spillway is that stored by the Authority. During the fiscal year, water was placed in storage at San Vicente Reservoir by the Authority for the account of member agencies. San Vicente storage statistics are shown in Table 4.

Another Authority-City of San Diego agreement permits storage up to 2,500 af in Lower Otay Reservoir, terminus of Pipeline 3. Storage here is for operational purposes only. No storage is provided for member agencies. The City is paid \$1.00 per af for the maximum storage in any twelve-month period subject to a minimum annual fee of \$1,000. The Authority also pays pumping charges which vary from \$1.50 to \$2.25 per af depending on water elevation.

Supervision and control of the San Diego Aqueduct system is conducted from the Fred A. Heilbron Operations Center, Escondido, where delivery requests from member agencies are received. Aqueduct flows and deliveries are monitored and controlled through a computer system. Communication with operating and maintenance field staff and with MWD's East Valley Operations Section at Lake Skinner is by two-way radios.

#### Deliveries and Rates

The San Diego County Water Authority aqueducts received 370,231 af from MWD during the fiscal year: Untreated water accounted for 241,869 af, and the balance of 128,362 af of water was treated at the Skinner Treatment Plant in Riverside County. This total flow of 370,231 af was 72,064 af more than the previous fiscal year which represents a 24.2 percent increase. The lowest flow rate averaged 182 cfs in December 1983. The highest average delivery of 728 cfs occurred during July 1983. The average for the entire year was 510.0 cfs. Water deliveries to member agencies and others during the fiscal year are shown in Table 8. Purchases by member agencies totaled 369,779 af, of which 141,382 af was treated water from the Skinner plant and treatment plants owned by member agencies. Annual water sales to individual agencies for the eight-year period 1976-77 through 1983-84, and total water sales from 1947-84, are shown on Table 7.

The operations and maintenance of the Authority is financed by a surcharge rate of \$5 per af on water delivered to its member agencies plus other miscellaneous general fund revenues.

Capital costs for the First and Second Pipelines have been financed by the United States Government. The Third and Fourth Pipelines were financed from the sale of General Obligation Bonds. The debt service on this voter-approved debt is funded by an ad valorem tax on all property within the San Diego County Water Authority service area.

Construction of the Fifth Pipeline was financed through a borrowing from California First Bank under Section 8 of the Water Authority Act and accrued reserves from general purpose revenues including property tax allocation from the County of San Diego from the 1 percent general purpose levy. The debt service on borrowings under Section 8 of the County Water Authority Act is funded by a surcharge rate of \$5 per acre-foot which is included in the total surcharge of \$10.00 per acre-foot. The tax revenues from assessed valuations of property within the Authority for fiscal year 1983-84, as determined by the County Assessor, was set at 7 tenths of a cent per \$100 of assessed valuation for retirement of voter-approved bonded indebtedness.

The Metropolitan Water District generally announces water rates two years in advance. Since 1975, water rates have been increased yearly from \$58.00 an acre foot to \$197.00 an acre foot in fiscal year 1983-84 because of the higher cost of energy for pumping and an increase in the proportion of the bond service cost being financed through water sales. These rates are in accordance with the City of Los Angeles-MWD agreement which was the result of a lawsuit between these two parties.

The MWD rate for untreated water for municipal and industrial use was \$144.00 per acre foot for the first half of fiscal 1983-84 and \$197.00 for the second half of fiscal 1983-84 to which was added the Authority's surcharge of \$10.00 per acre foot. Treatment charges by MWD at the Skinner Treatment Plant were \$28.00 per af for the same period. Contracts between the Authority and some of its member agencies which have treatment plants provide for service by these plants. This treated water is then sold to agencies which do not have treatment facilities. The commodity charge for treatment of water as of July 1, 1983 was \$35.00 per af which remained in effect the entire fiscal year.

The following is a partial summary of past and future MWD rates to the Authority and Authority surcharge rates:

**SUMMARY OF UNTREATED WATER RATES**  
(Dollars Per Acre Foot)

From	To	MWD	Authority	Total	Agricultural Rebate	Resulting Agricultural Rate	Municipal and Industrial Interruptible Water Rate
7/01/58	1/01/61	15.00	2.00	17.00	3.00	14.00	—
1/01/61	1/01/62	17.00	2.00	19.00	4.25	14.75	—
1/01/62	1/01/63	19.00	2.00	21.00	5.50	15.50	—
1/01/63	1/01/64	21.00	2.00	23.00	6.75	16.25	—
1/01/64	7/01/64	24.00	2.00	26.00	9.00	17.00	—
7/01/64	9/01/64	25.00	2.00	27.00	9.75	17.25	—
9/01/64	7/01/65	25.00	1.25	26.25	9.75	16.50	—
7/01/65	7/01/66	28.00	1.25	29.25	12.00	17.25	—
7/01/66	7/01/67	31.00	1.25	32.25	14.00	18.25	—
7/01/67	7/01/68	34.00	1.25	35.25	16.00	19.25	—
7/01/68	7/01/69	37.00	1.25	38.25	18.00	20.25	—
7/01/69	7/01/70	40.00	1.25	41.25	20.00	21.25	—
7/01/70	7/01/71	44.00	1.25	45.25	23.00	22.25	—
7/01/71	7/01/72	48.00	1.25	49.25	26.00	23.25	—
7/01/72	8/13/73	52.00	1.25	53.25	28.50	24.75	—
8/13/73	7/01/75	56.00	1.25	57.25	31.00	26.25	—
7/01/75	7/01/76	58.00	1.25	59.25	33.00	26.25	—
7/01/76	7/01/77	62.00	2.00	64.00	33.00	31.00	—
7/01/77	7/01/78	67.00	2.00	69.00	34.00	35.00	—
7/01/78	1/01/79	74.00	2.50	76.50	34.00	42.50	—
1/01/79	7/01/79	79.00	3.00	82.00	34.00	48.00	—
7/01/79	7/01/80	79.00	5.00	84.00	34.00	50.00	—
7/01/80	7/01/81	90.00	9.00	99.00	39.00	60.00	—
7/01/81	7/01/82	96.00	9.00	105.00	35.00	70.00	70.00
7/01/82	7/01/83	114.00	10.00	124.00	35.00	89.00	89.00
7/01/83	12/31/84	144.00	10.00	154.00	44.00	110.00	110.00
1/01/84	7/01/84	197.00	10.00	207.00	44.00	163.00	163.00
7/01/84	7/01/85	197.00	10.00	207.00	44.00	163.00	163.00
7/01/85	7/01/86	192.00	10.00	202.00	44.00	158.00	158.00

NOTE: The above summary of water rates shows prices for untreated Colorado River and State Project water: \$13.00/af for the period 7/01/76 to 7/01/77; \$17.00/af for the period 7/01/77 to 7/01/78; \$21.00/af for the period 7/01/78 to 7/01/79; \$25.00/af for the period 7/01/79 to 7/01/82; \$26.00 for the period 7/1/82 to 7/1/83; and \$28.00 for the period 7/1/83 to 7/1/84; and \$32.00 for the period 7/1/84 to 7/1/86 must be added to the above rates for treated water deliveries to the Authority from MWD.

As shown in the summary above, MWD now gives encouragement to better local control and management of water supplies through an interruptible water rate. To obtain the interruptible rebate, the Authority certifies the quantities of water in storage which qualify as interruptible water to MWD. Rebates are shared with member agencies in proportion to the interruptible water they have in storage.

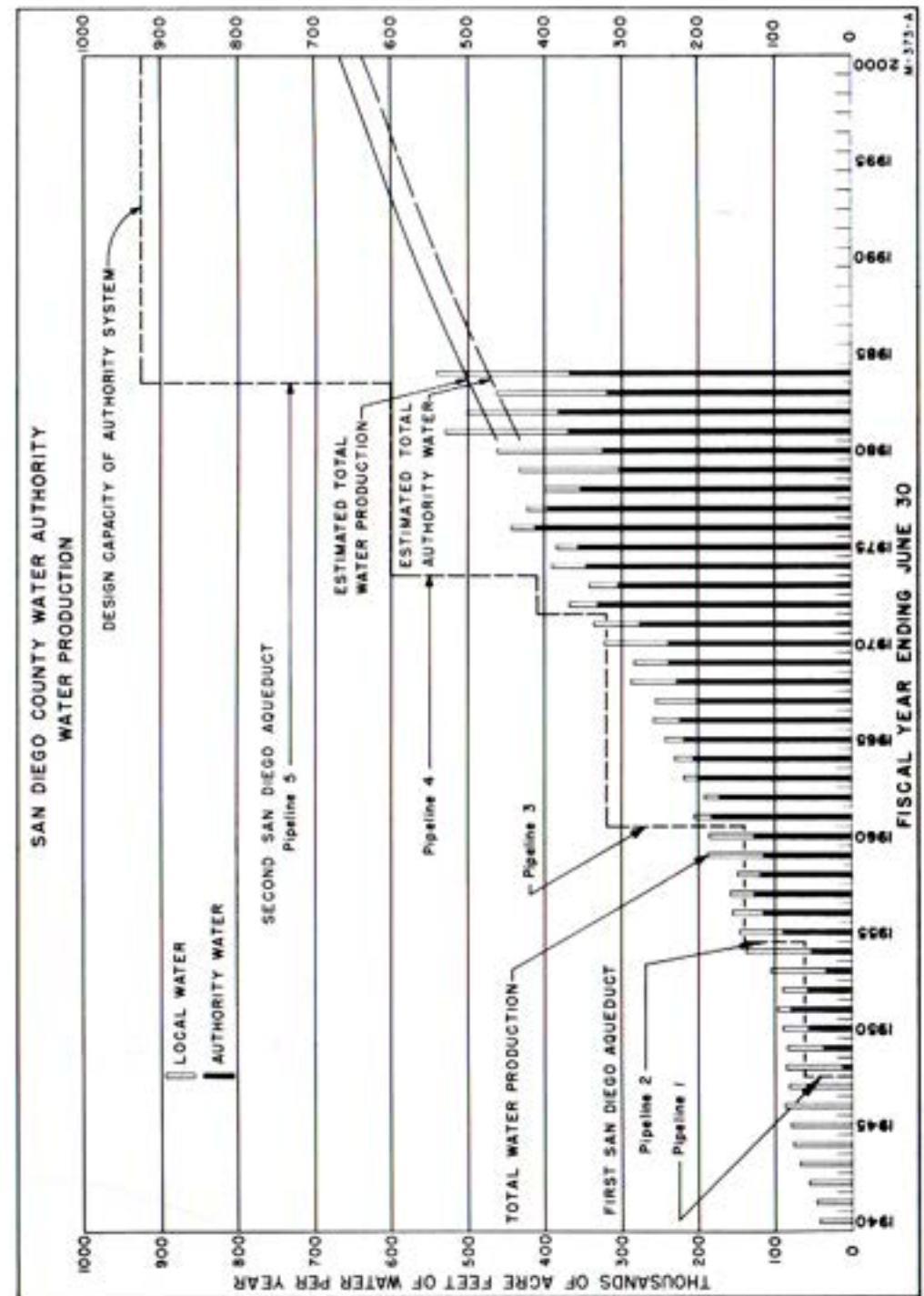


Figure B. Water Production of Authority Member Agencies

**Water Production of Member Agencies**

The term "Water Production" describes the quantity of water an agency obtains from all sources to meet its consumers' needs. It includes losses between the source and the consumer. These losses may result from pipeline breaks, evaporation from reservoirs, and operating shortages. Sources include impounding reservoirs, wells, and the Authority system.

Total water production for each of the 24 member agencies of the Authority is shown in Table 4. During 1982-83, the total water production was 462,357.1 af. The water production for the current year 1983-84 is 540,261.7 af which is an increase of 77,904.6 af or 16.8 percent. The highest monthly production occurred during July 1983 when 60,740.4 af of water were used. This was less than the record high month of July 1981 when 65,412.9 af were used. The lowest monthly production occurred during December 1983 when 23,037.9 af of water were used. The Authority supplied a high of 74.9 percent of the water production during the month of May 1984 and 67.8 percent of the production for the fiscal year 1983-84.

Local water supplies were reduced by below normal rainfall for 1983-84 as tabulated below:

Location	Rainfall	Percent of Normal
Lindbergh Field	5.73 in.	58.6%
Lake Cuyamaca	25.4 in.	67.2%
Lake Henshaw	18.0 in.	69.4%

Local and imported water stored in regional reservoirs decreased from 526,113 acre-feet on June 30, 1983 to 378,723 acre-feet on June 30, 1984 which is a decrease of 28 percent.

The City of San Diego maintains the most extensive system of impounding reservoirs in the Authority service area. This system produced 96,775.6 af of water during the fiscal year of which agencies outside of the Authority area received 6,148.6 af. Helix Water District produced 15,607.9 af from Lake Cuyamaca and its wells in the El Monte Basin. The Vista Irrigation District (part of Bueno Colorado Municipal Water District) produced 14,887.4 af from Lake Henshaw and the Warner Ranch wells. The City of Escondido produced 10,589.8 af from the Henshaw-Wolford system, and 2,004.4 af were produced within Yuima Municipal Water District from the Pauma Valley wells. Sweetwater Authority produced 25,505.9 af for use in National City and South Bay Irrigation District.

Twelve of the 24 member agencies are 100 percent dependent on imported water. The twelve remaining agencies vary from 97.7 percent (City of Poway) to less than 1.0 percent (Sweetwater Authority) dependence on Authority water.

Water production per unit area is highest in the urbanized portions of the County. However, the per capita use of water is generally less in areas of greater population density such as Helix Water District, National City, and the City of San Diego. Water production per unit area in the less densely populated areas, such as Rainbow Municipal Water District, Valley Center Municipal Water

District, and De Luz Heights Municipal Water District is similar to more urbanized areas but per capita use is considerably higher.

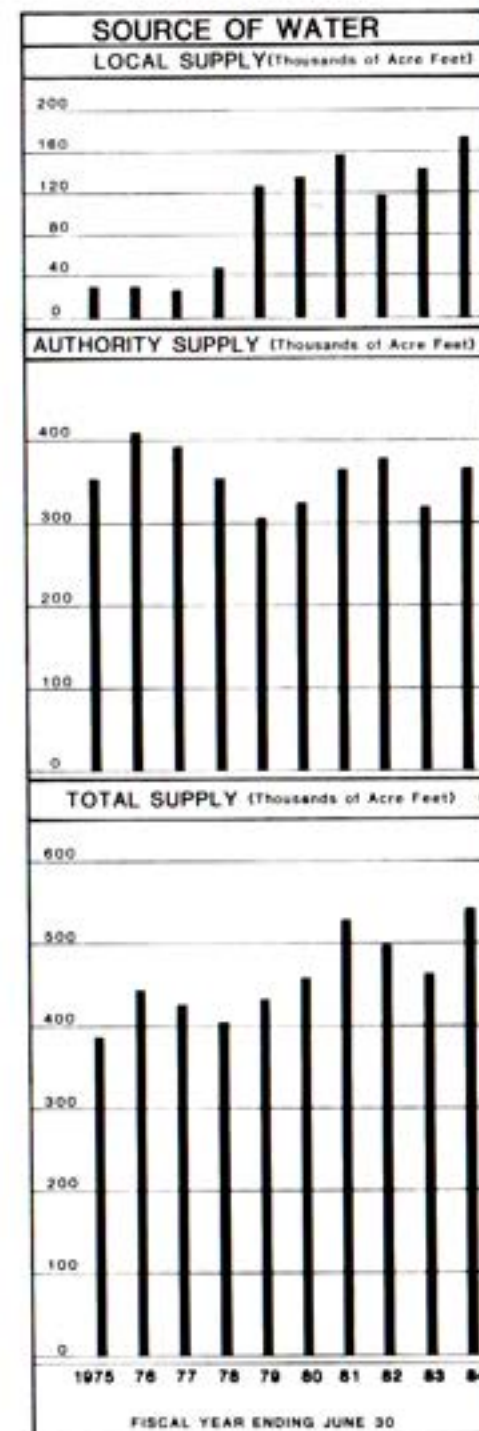
Average daily per capita consumption of municipal and industrial water for fiscal year 1983-84 was 185 gallons per day. This is up from 169 gallons per day during the previous year and 181 gallons per capita per day two years ago and reflects the very dry spring weather in 1984. It is estimated that the Authority serves approximately 47% of the geographical area within its boundaries.

The combined water production of Authority member agencies is shown in Figure B. Shading indicates the proportion obtained from local sources compared with that supplied by the Authority. Present transmission facilities are adequate to meet water production demands until the year 2000.

**Water Quality**

The general quality of water entering the Authority system continues to improve. However, some variation in raw water turbidity still occurs due to seasonal high algae levels. This is serious only for users of Colorado River water which is not filtered prior to distribution. Turbidity at Miramar Treatment Plant ranged from 1.0 Turbidity Units (TU) in December 1983 to a high of 7.6 units reported in September 1983.

Algae growth in Authority pipelines is controlled through a program of continuous chlorination. The rate of chlorine applied during the year was 0.75 parts per million (ppm) to flows in Pipelines 1, 2, and 3 at the



Rainbow Chlorination Station. This program has effectively controlled the residual algae from the Colorado River Aqueduct and provides continuous chlorination of untreated water from Lake Skinner. Treated water is delivered to the Authority from the Robert A. Skinner Treatment Plant where it is chlorinated and filtered.

Chemical constituents of the dissolved solids in the Colorado River water are shown in Table 10. The analyses are based on samples taken from West Portal of San Jacinto Tunnel and tested by MWD. Total hardness ranged from a high of 335 milligrams per liter (mg/l) to a low of 316 mg/l. Water temperature varied from a high of 81.5°F (27.5°C) in September 1983 to a low of 52.7°F (11.5°C) reported in January 1984.

The chemical constituents of the dissolved solids of treated, blended water at Lake Skinner are shown in Table 11. Total hardness ranged from a high of 325 mg/l to a low of 241 mg/l. Water temperature ranged from a high of 78.4°F (25.8°C) recorded in August 1983 to a low of 54.7°F (12.6°C) in January and February, 1984.

**Agricultural Water Use**

Agricultural water use by member agencies of the Authority during 1983-84 was 123,867 af which is 27,280 af more than the previous year's use of 96,587 af. The percentage of agricultural water to the total water production was 23 percent, an increase from 21 percent in 1982-83. About 91 percent of water used for agricultural purposes is supplied by the Authority while only 68% of the total amount of water produced is from the Authority. This occurs because agencies with a high percentage of agricultural water have little or no local water production. For example, Rainbow Municipal Water District uses approximately 88 percent of its water for agricultural purposes but its local production is less than 1 percent. While on the other hand, the City of San Diego uses less than 1 percent of its water for agricultural purposes but its local production is 46.1 percent of its total water needs. A complete summary of agricultural water use is contained in Table 4.

**Water Treatment**

The Robert A. Skinner Treatment Plant began operations in September 1976. Initial capacity of the facility was 150 million gallons per day (mgd). A 90 mgd expansion of the plant was completed and put into operation in May 1979. This expansion, together with the 100 mgd Skinner No. 2 Plant now under construction, will provide treated water to 13 agencies within the Water Authority requiring treated water.

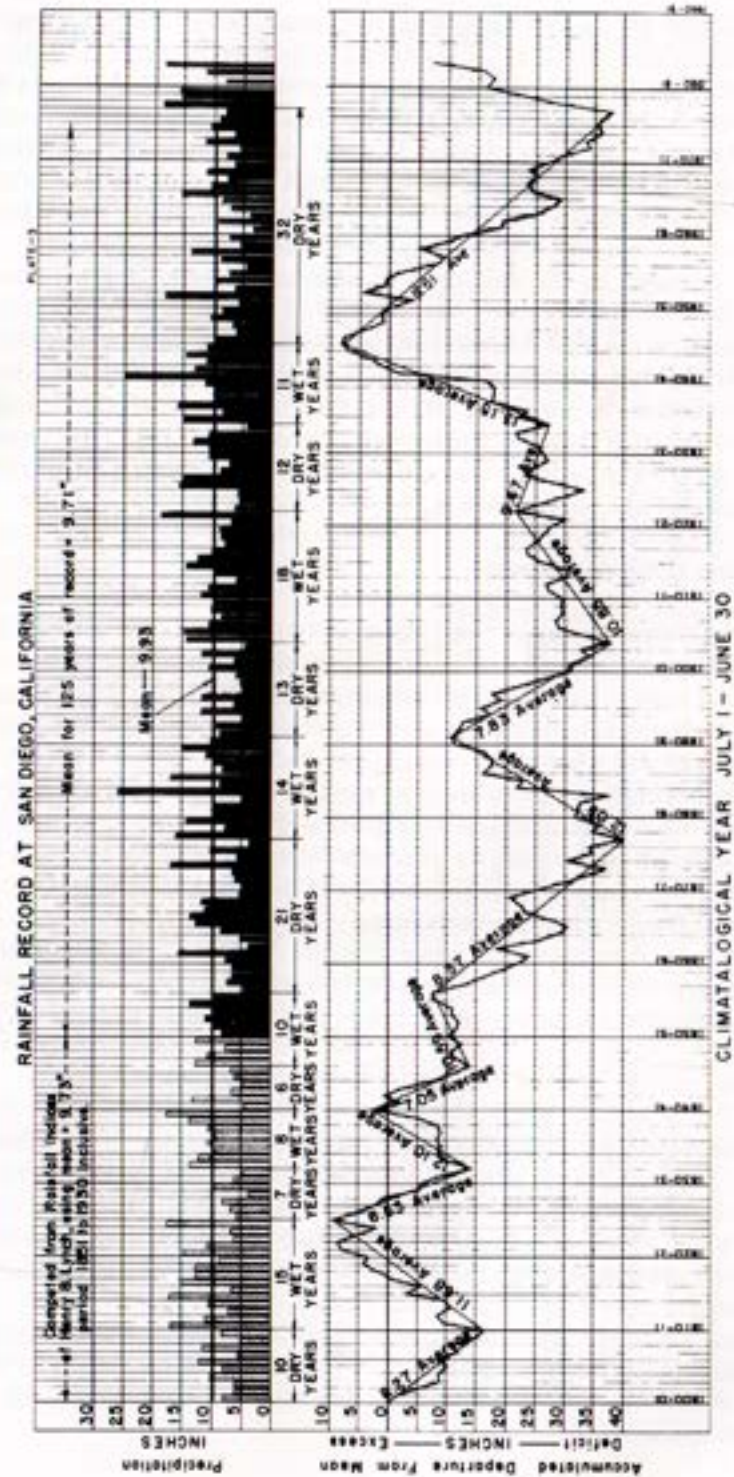


Figure C. Rainfall Record at San Diego, California

Member agencies of the Authority that own and operate treatment plants within the County are: The City of San Diego, the City of Escondido (joint ownership with Vista Irrigation District), San Dieguito Water District-Santa Fe Irrigation District (joint ownership), Helix Water District, City of Oceanside, City of Poway, Ramona Municipal Water District, and Sweetwater Authority (operating agency for South Bay Irrigation District and National City). The Authority purchases treated water from Helix and Poway to supply Padre Dam Municipal Water District and Ramona Municipal Water District. The cost of all treated water delivered by the Authority to its member agencies is the same regardless of the treatment source.

Several agencies on the First Aqueduct still use Colorado River water with dual chlorination as the only treatment provided. The Authority provides the first chlorine application in its pipelines, and the agencies are responsible for the second chlorination after delivery. Completion of the Skinner No. 2 Treatment Plant and the Auld Valley pipeline connection to the First Aqueduct will provide treated, blended water in these pipelines.

**Allocation of Water to Member Agencies**

The County Water Authority Act (Section 5.11) provides a preferential entitlement for the purchase of water by each of the Authority member agencies. This preferential right is established by the proportion of all payments by each agency to the Authority to meet capital costs, including the annexation fees, taxes and that portion of water purchases related to capital expenditures.

Voluntary agreement between the member agencies has made it unnecessary to invoke these provision when shortages have developed. When water and capacity are available, agencies are permitted to purchase without restriction. In addition, the California Water Code (Section 350 through 358) contains procedures which may be followed should water shortages occur.

The Authority's Administrative Code (Section 12.4 and 12.5) contains provisions for normal and abnormal water allocations in situations not deemed to be so serious that either of the above-mentioned provisions need be invoked.

**Future Supplies**

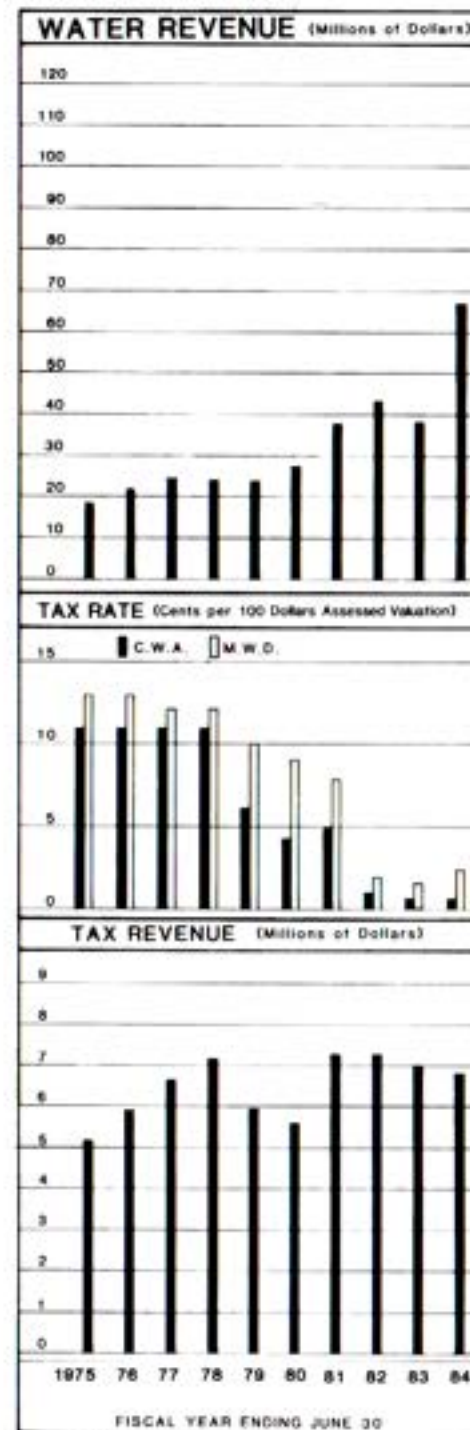
It is the responsibility and the policy of the Authority to provide all the supplemental water required by its member agencies to meet the needs of their consumers. It is recognized that this policy must be tempered by an obligation to encourage prudent conservation practices. It is also recognized that there are certain acts of nature against which there is no defense available within reasonable economic bounds.

Growth rates within the Authority's service area have indicated a continued population increase for the foreseeable future. The long lead time required for development of new water resources demands that constant attention be given to meeting future needs.

The Water Authority obtains all of the water it distributes from The Metropolitan Water District of Southern California which has two sources of supply: the Colorado River and the State Water Project. Population forecasts indicate that MWD's population will increase from the present 13 million to 16 million, and the Authority's population will increase from the present 2 million to 2.71 million persons by the year 2000.

The MWD Board has adopted a policy to provide additional water and/or facilities, as needed, to meet demands of its member agencies. To fulfill that policy, MWD contracted with the State of California in 1960 for 1.5 million acre feet annually from the State Water Project. When faced with a loss of over half its annual Colorado River supply of 1,212,000 af because of the U.S. Supreme Court's decision in Arizona v. California in 1964, MWD amended its contract with the State to provide an additional 500,000 af per year. Annexations and other changes have increased that MWD-State contract to 2,011,500 af per year.

The California Aqueduct, a key water supply feature of the State Water Project, was completed in 1973. MWD takes delivery of State Project water at several points. Supplies destined for San Diego County are delivered to MWD at Lake Perris, terminus of the 444-mile aqueduct. Water then flows through Lakeview Pipeline which parallels the Colorado River Aqueduct. Northern California water is mixed with Colorado River water at the existing turnout for the San Diego Canal. The blended water then flows south into Lake Skinner.



Additional water resources must be developed during the 1980's as a result of the failure of the voters to approve the completion of the State Water Project. The Authority, MWD, the State of California, various federal agencies, and many private organizations are presently conducting investigations of probable alternate water sources. The Board of Directors of the San Diego County Water Authority authorized the General Manager to prepare a comprehensive study of alternative water resources including conservation, reclamation, desalination, additional emergency and impounding storage, and groundwater development. The Board has also supported local projects of member agencies such as the City of San Diego's Aquaculture Project and the Santa Margarita Project to serve Fallbrook and Camp Pendleton. In addition, the E.I.R. and financial plan for the Pamo Dam and Reservoir Project have been approved by the Board of Directors of the Water Authority. Construction is scheduled to start in July 1985 with the completion date in late 1986.

Figure B shows the increase in water requirements within the Authority since 1940.

## PUBLIC INFORMATION

The San Diego County Water Authority is charged with the responsibility of providing an adequate supply of water and has the obligation to make residents of its service area aware of the water supply picture. Meeting that obligation is made more difficult as the Water Authority has limited contact with the ultimate water user. Therefore, the Water Authority, in conjunction with its member agencies, sponsors an area-wide public information program designed to advise the community on water issues, problems and solutions, and to encourage prudent use of the existing supply.



**The Program** — The value of a public information program lies in its flexibility to communicate the same message to different audiences. With that thought in mind the program follows:

### Community Relations

**Education** — A school program on water has been offered free of charge since 1975 to elementary, junior and senior high schools, colleges, universities, and adult education. The subject matter is variable enough to relate to fields of study such as government, history, geography, the environment, biology, chemistry, physics, mathematics and economics. The program is managed by three full-time educational resource specialists. During fiscal year 1984 over 23,000 students were addressed in this program.

**Speakers Bureau** — During the year guest speakers from the Water Authority addressed over 2500 members of community, professional organizations, service clubs and educational institutions.

**Display Program** — Water information was disseminated at home and trade shows and professional conferences. Brochures, pamphlets and conservation kits were distributed through this program. The displays were also made available to military commands and community and local government for use in their water awareness programs.

**Newsletter** — "Inside Water — The Chairman's Report" was published several times during the year to inform community leaders and other interested persons.

**Water Conservation Awards** — The Water Authority presents annual awards in recognition for exemplary effort to conserve water. This year the awards were presented to: Mission Resources Conservation District, Harry and Elizabeth Mumford, San Diego Transit Corporation, Pacific Scene, Inc., and Helix Water District.

**Low-Water Use Gardens** — A permanent low water use garden is located at the Southern California Exposition Grounds. It is used to present lectures, demonstrations, classes and exhibits on water conservation to visitors at the Del Mar Fair. Other low-water use demonstration gardens are maintained by Costa Real Municipal Water District, Helix Water District, Vista Irrigation District, Sweetwater Authority, and the County of San Diego. The City of San Diego has started a major low-water use garden program at sites throughout the city.

**Parade** — Ten units and a marching band were sponsored by the Water Authority for the annual Del Mar Fair parade.

**Media** — Media time was purchased to present 226 (10-30 sec.) television commercials which were projected to reach over 1.5 million viewers in this year.

**Print Media** — Approximately 1600 column inches of newspaper copy were devoted to the Water Authority, its member agencies, water issues or related topics.

**Internship** — The Water Authority sponsored a communications intern from San Diego State University.

**Government Relations**

Legislation — The Water Authority initiated and supported legislation aimed at resolving water issues and authorizing the completion of the State Water Project. The Board of Directors supported by Resolution:

Assembly Bill 1732 — To submit the Clean Water Act of 1984 to voters

Assembly Bill 2619 — Revenue Bonds

Assembly Bill 2192 — Repeal restrictions on MWD to impose property taxes.

The Legislative Water Package and SCA-16, Area of Origin Protection Bill.

Seminars — Staff assisted in the coordination of a seminar sponsored by the National Water Alliance.

Energy — The Water Authority held groundbreaking ceremonies for the Miramar and Alvarado Hydroelectric Plants. These are the first in a series of small hydroelectric plants to be constructed at strategic locations along the San Diego Aqueducts.

## OPERATION AND MAINTENANCE

**General**

Operation and maintenance of the Water Authority's Aqueduct facilities and equipment is directed by the Superintendent from the Fred A. Heilbron Operations Center, 610 West Fifth Avenue, Escondido, CA. The Authority's operation and maintenance force of 23 persons operates the Aqueduct system and normally performs all maintenance and repair of the Aqueducts as well as construction and modification of metering and control buildings.

The 7 people in Aqueduct operations, which includes two Systems Technicians, all serve as System Operators and also maintain all meters, telemeters, recorders, process control, and water disinfection equipment. The maintenance force of 16 includes a warehouseman, two shop mechanics and a three-man construction crew.

The Operations Center main building contains a computerized telemeter control system and offices for operation, maintenance, construction and field engineering. A shop building has facilities for repair and servicing of all Authority vehicles and heavy equipment, plus a small machine shop, meter shop and equipment maintenance office. Materials, supplies, tools and small equipment are stored in the warehouse which also provides security parking for equipment and contains the valve repair and carpentry shops.

A radio system using radio relay sites on Palomar Mountain connects the Operations Center and San Diego office with Metropolitan Water District's Skinner Treatment Plant in Riverside County, 25 Authority mobile radios and nearly all major San Diego County water purveyors. If relay stations fail, the relays can be bypassed and radio units can be contacted directly.

A standby generator supplies emergency power for the Fred A. Heilbron Operation Center's Aqueduct System control room, as well as other offices and shops.

**Operations**

The Operations Center is staffed every day, including weekends and holidays from 7:30 to 4:00 p.m. During off-hours a duty systems operator equipped with an Authority inter-agency mobile radio answers Authority phone calls at his home. A pager will notify the duty operator if any phone calls are missed. In emergencies the duty operator is assisted by the Superintendent, Senior Systems Operator and Senior Systems Technician who also have inter-agency radios for quick response and field coordination with other agencies.

Four of the five pipelines presently serving the Water Authority carry untreated water. Three of the four raw water pipelines receive a continuous injection of chlorine from the Authority's Rainbow chlorine station. Chlorine is used to control algae and asiatic clams in the pipelines and also provides the first of a required dual chlorination for First Aqueduct agencies delivering Colorado River water without full sedimentation and filtration treatment. Water in the treated water line is chlorinated by M.W.D. at the Skinner Treatment Plant and boosted with chlorine from the City of San Diego's Miramar Treatment Plant.

The Water Authority serves as agent of the north county First Aqueduct water districts by measuring and reporting Aqueduct water turbidity to meet Safe Drinking Water Act daily monitoring requirements. Results of water quality sampling and measurement by both Authority forces and member agencies' treatment plants are also compiled for a more complete water quality record.

Flow charts and meter readings are compared for indications of inaccuracies. The calibration of each active meter is checked quarterly. Meter accuracy is also checked at the request of a member agency.

Flow changes from Metropolitan Water District in both the treated and raw water aqueducts are controlled either locally or remotely by M.W.D.'s Skinner Treatment Plant Operations Center. Because the plant's operation room is manned around the clock, flow changes can be requested and made at any time in an emergency. They are normally made at two designated times each day for the convenience of the treatment plant operation.

Most of the metered flows in the aqueduct system are controlled and displayed on the Authority's operation center new automatic computerized control system. The computer warns the daytime operator of problems by alarm displays and a synthesized voice, and the night time duty operator by telephone. The duty operator may also interrogate the computer control system by telephone.

The aqueduct system in San Diego County has no operational storage and all flow changes must be carefully coordinated to maintain the proper flow to the service connections. The computer and a status board show when too little or too much water is available to meet the member agencies' needs. Each aqueduct's current flows, requested flows, meter sizes, maximum allowable and capacity flows, critical pipeline flows and valve information are displayed.

For emergencies a van used for aqueduct operations is equipped as an emergency operations center where telemeter functions can be monitored.

Authority water is stored in several reservoirs by other water agencies, principally the City of San Diego's San Vicente Reservoir. These water storage facilities cannot return stored water to the aqueduct for use elsewhere.

The Authority's Miramar Pump Station can pump treated water from the City of San Diego's Miramar Treatment Plant into the aqueduct. Such water is available only if additional untreated water can be delivered concurrently from the aqueduct to the plant. The Miramar Pump Station can also be used to deliver aqueduct treated water directly into the Miramar Treatment Plant's clearwell treated water storage by reverse flow, bypassing the treatment plant.

On July 11th Metropolitan Water District started filling the newly completed Pipeline #5; because of high demand for water it was necessary on July 14 to increase the flow to 117 cfs and put the pipeline in full service. This brought the combined aqueduct flows to 871 cfs, the highest flow that the Authority has received from M.W.D.

Metropolitan Water District of Southern California was able to put 1130 cfs through the San Diego Canal during a capacity test. This flow is over 100 cfs better than the previous high, mostly because Lake Skinner was lower than during the earlier test.

In November, the Metropolitan Water District control valve at Lake Skinner on the treated water line went out of control for approximately four and one-half minutes increasing flows by about 100 cfs. The increased flow caused the covers of two vent structures to be blown off and the vent stacks over-topped at three locations: Black Mountain, Miramar and Navajo Road. Damage was minor with mud on the parking area and some water in two business establishments at Navajo Road vent.

During the pipeline rehabilitation project with people working inside the pipe, it was necessary to extend the operation center control room office hours to a two-shift, 15-hour day.

A microprocessor was installed at Bueno #8 to work with the central control computer for monitor and control of the entire Tri-Agency Pipeline with telemeter tone units installed at all other Tri-Agency Pipeline meters. Electric valve operators on inactive valves were relocated to active valves to permit remote control of these service connections.

Bids received for chlorine supply for the 1984-85 fiscal year were 37% higher than the previous year, the low bid being Jones Chemicals at \$191.00 per ton.

The chlorination station suffered from vandalism and theft of the emergency breathing apparatus in May. Window bars were installed to prevent unauthorized entry. Chains to secure chlorine tanks and a new chlorine leak detector were installed. A new automatic chlorine station telephone dial out alarm system was added. This alarm system will alert the duty operator in case of chlorine leak, low chlorine pressure, water leak or power outage.

Because the City of San Diego used chloramination (chlorine and ammonia) for disinfection, it was necessary for the State Department of Public Health to approve the delivery of chloraminated water to agencies south of Miramar before the Miramar Pump Station could be activated in September.

Metropolitan Water District of Southern California initiated a heavy chlorination program to maintain a 9-pump flow in the Colorado River Aqueduct to utilize the less expensive water from this source. This caused some complaints of high turbidity, particularly on the First Aqueduct where no reservoir is available for settling. Most First Aqueduct agencies north of Escondido exceeded Safe Drinking Water Act turbidity maximum contaminant levels, and were required to notify their customers of this fact.

### Shutdowns

In September the Fallbrook-Oceanside branch line was shut down for one day to replace a nipple under an air vacuum relief valve.

The Tri-Agency Pipeline was shut down on October 10th so that a road contractor could repair a pipe which had been damaged by his forces. The pipeline was put back into service on the 12th. On October 13th, the contractor again damaged the Tri-Agency Pipeline by running into a structure with a dozer. The pipeline was shut down and partially drained for replacement of a damaged valve and returned to service the same day.

The La Mesa-Sweetwater Extension was shut down on November 1st for lowering by the County of San Diego contractor at Los Coches Creek. This work was completed in three working days and the line placed back in service.

Treated Water Pipeline 3 was shut down and drained on November 28th for the contractor to begin installation of rehabilitation cylinders on November 29th. All agencies south of Padre Dam #4 were without water delivery. On December 22nd, the treated water pipeline below Padre Dam #4 was put back into service.

A shutdown of Pipelines 1 and 2 were required for the Bureau of Reclamation tunnel inspection which shut down the Fallbrook-Oceanside Branch. These pipelines and Pipeline 3 above Padre Dam #4 were put back into service on December 10th, 11th and 22nd, respectively. Water was not available to the First Aqueduct until about midnight Friday night, December 23rd.

The First Aqueduct was shut down for about three days starting January 27th during a period of high turbidity caused by Metropolitan cleaning the Colorado River Aqueduct.

On Sunday, January 15th, the treated water pipeline south of Navajo vent was shut down and drained to prepare for another phase of the pipeline rehabilitation project on Monday, January 16th. It was placed back in service on February 3rd. On that date Authority personnel made a visual inspection of the length of the project plus about 200 feet on each end to ensure no debris or tools were left in the pipeline.

A leak on the Fallbrook-Oceanside Branch line occurred on May 31st and was repaired and put back into service the following day.

### Maintenance

The Authority maintenance yard is located at the Fred A. Heilbron Operations Center in Escondido. All maintenance and force account construction is based at this yard. The Operations Center maintenance yard is located near the center of the aqueduct system with the most distant facilities being about 60 miles away.

For major projects, a field office may be established in an office trailer or a larger combination construction trailer.

Maintenance activities include servicing, repair and maintenance of buildings, pipelines, roads and equipment. The facilities and equipment maintained include the Operations Center buildings, shops and yard, 221 miles of major pipelines, 130 miles of rights-of-way, 106 miles of patrol roads, 66 buildings housing meters and control equipment, a chlorine station, the Miramar Pump Station with a capacity of 180 cubic feet per second and over 900 underground valve vaults. All vehicles, trucks, light and heavy equipment, valves, meters, telemeters and control equipment are serviced and repaired in Authority shops or by specially equipped service trucks.

Maintenance equipment includes two motor graders, a bulldozer, two skip-loaders, a backhoe, 5 and 25-ton cranes, two forklifts, dump trucks, truck tractors and equipment trailers, compressors, generators and pumps, and welders. All pickups and most other trucks have mobile radios for efficient response.

The Authority maintenance force of 12 maintenance workers and general foreman, 2 mechanics and 1 warehouse supervisor provide maintenance of vehicles, construction equipment, pipelines, valves, rights-of-way, buildings, vaults, and the Operations Center buildings and yard. They also construct control and metering facilities, patrol the pipelines and inspect construction projects near the aqueducts.

To take advantage of the longer daylight hours and reduce travel time, the maintenance crew is on a ten-hour, four-day work week schedule during months of Daylight Savings Time. The vehicle shop is open up to two hours after the regular shift to allow for minor repairs and servicing. The shop and warehouse are open every normal working day.

The pipeline and patrol roads are normally checked at least once each week. Twice each year the pipelines are checked by foot patrol. Much of the maintenance time is spent grading, moving, rebuilding or replacing the 106 miles of access roads and maintaining the associated gates, culverts and culvert headwalls.

Shop work includes routine maintenance, servicing and repair of vehicles and equipment as well as specialized equipment such as that used in the unique Authority pipeline rehabilitation project. The average age of the larger Authority equipment is 19.75 years old. This equipment requires extra time and care to keep it in top operating condition and appearance.

The pipeline rehabilitation project during December and January was performed by contract, and about 30% of the maintenance force was spent assisting the contractor.

Personnel from the Bureau of Reclamation performed their tri-annual inspection of portions of the First Aqueduct, checking the Rainbow and Red Mountain tunnels and surface cuts at ends of tunnels. Although there were some problem areas, erosion damage this year was very light because of the extremely low rainfall after January 1st when most damage normally occurs.

Several pipeline structures were revised in locations where road improvements were in progress. Changes in drainage patterns have also required several structures to be raised to prevent flooding.

## Miscellaneous

The Board of Director's Engineering Committee held its annual aqueduct tour on May 3, 1984. This year's tour featured rights-of-way access problems, alignment of proposed Pipeline 4A, and ground breaking ceremonies for the Miramar Hydroelectric Plant.

Several other tours of the Authority Operations Center were made by groups from local cities, service clubs and as part of tours to MWD's facilities on the Colorado River Aqueduct.

The Authority's computerized control system has been featured on several tours from water agencies throughout Southern California and was the subject of an American Water Works Association Water System Controls forum meeting.

Vandalism and forced entry is becoming an increasingly common problem. The Operations Center, chlorination station and several scattered control stations have had illegal entries. Security devices were added at the chlorination station and selected control stations. Intrusion alarms were added to the telemetry program. Switches were placed on all Operations Center locks to indicate any unlocking or forced entry of a door. These switches are monitored by the control computer. To prevent vandalism the inactive Tijuana meters were removed and stored in the meter shop.

## DESIGN AND CONSTRUCTION

### Pamo Project

On July 11, 1983 James N. Montgomery Consulting Engineers, Inc. transmitted the final report entitled "Feasibility Study Report on Pamo Dam and Reservoir". The report was authorized by the Metropolitan Water District and the San Diego County Water Authority to determine the feasibility of a joint participation project. The report concludes that both agencies will benefit from the enhancement of storage at favorable unit costs to both parties.

On November 18, 1983 Mooney-Lettieri and Associates completed the Draft Environmental Impact Report and Environmental Assessment for the Pamo Reservoir. A public hearing was held by the Board on January 12, 1984 and on April 12, 1984 by resolution, the Board of Directors of the San Diego County Water Authority certified completion of the Final Environmental Impact Report and Environmental Assessment for the Pamo Reservoir Project.

In March, 1984 Dames and Moore, the Authority's consultants on the dam, completed the Preliminary Design Report. The proposed design is a 264-foot high roller-compacted concrete dam impounding 130,000 acre feet of water. The study included some very extensive field work in which numerous rock cores were recovered using diamond drills, and the excavation of test pits. The earth-fill dam location was well explored before selecting the roller-compacted concrete alternative.

The areas covered in this report were geology, seismicity, hydrology and reservoir design, preliminary dam design, preliminary spillway and outlet works design, access roads, and an estimate of construction costs and scheduling.

On April 12, 1984 the Board authorized the General Manager to contract with Dames and Moore for the preparation of the final design, plans and specifications for Pamo Dam. No office or field work had been done under this contract prior to June 30, 1984.

San Lo Aerial Survey photographed the 20-mile long pipeline route and furnished the Authority with over half of the 100-scale topography sheets which are the basis of the pipeline design. About half of the cost of the project will be in the construction of the pipeline which will be designed and the construction administered by the Authority staff.

The Pamo Dam Project will appear on the November 6, 1984 ballot as Proposition B and will authorize the sale of \$82,000,000 in bonds.

#### **Pipeline 4A**

Pipeline 4A is a 72-inch diameter line that parallels the existing 72-inch Pipeline 4 which is an extension of the 96-inch segment of Pipeline 4. This 6,700 l.f. of pipeline will be constructed from Highway I-15 to the Miramar service connection and will facilitate the full utilization of Pipeline 4. The area through which construction will take place is rapidly developing with high-density residential and commercial structures. Most of the pipeline excavation requires very heavy blasting necessitating restrictions and monitoring of each series of detonations. Other difficulties are expected with the existing utilities in Scripps Lake Drive and in the control of heavy traffic through that portion of the work.

Bids were taken for Pipeline 4A on May 8, 1984 and L. H. Woods and Sons was the lowest of eight bids received at \$2,248,640.00. The basis of L. H. Woods' bid was an all-welded steel pipeline. Depending on the nature of the material excavated from the trench, a considerable quantity of imported sand may be required at some additional cost.

Clearing on the project started on June 4, 1984, and drilling and blasting began on June 11 and continued through the month. Kaiser Steel started pipe fabrication in mid-June. The lining and coating of the pipe will be applied by Ameron-Price in their Fontana plant.

#### **Alvarado & Miramar Hydroelectric Plants**

The Authority's design consultant for the hydroelectric plants at the Alvarado and Miramar locations is CH2M-Hill. Under their supervision bids for generation equipment were received on September 22, 1983. The low bidder for the turbines and generators was submitted by Axel Johnson Engineering Corporation with a total bid of \$2,032,390. The turbine manufacturer is Boving & Co., London, England, and the generators are manufactured by Kato Engineering Co., Manakato, Minnesota.

Bids for the civil work were received on March 14, 1984 for which DVY Construction was the lowest of 7 bids received at \$1,353,000 for both facilities. The Contractor started the excavation at both sites in June 1984.

#### **Rehabilitation of Pipeline 3**

In January and February 1984 rehabilitation of 8,763 feet of Pipeline 3 was completed. The work was performed under a contract with Vido Artukovich and Sons, Inc. in the amount of \$1,612,825. The unit cost for the contracted work is about \$190.00/L.F. and the related Authority costs are about \$10.00/L.F.

Rehabilitation of 15,860 feet of pipeline has been completed through February 1984. Rehabilitation involves the removal of several sections of pipe for access, transporting collapsed steel liners through the pipe to the appropriate location, expanding in place, welding, grouting the annular space and applying a cement mortar lining before closing up the pipeline.

At the May 1984 Board meeting an additional \$726,000 was approved which would provide the estimated \$2,373,000 to complete the remaining 10,700 feet of rehabilitation in January/February 1985. All of this work is located south of Sweetwater Reservoir.

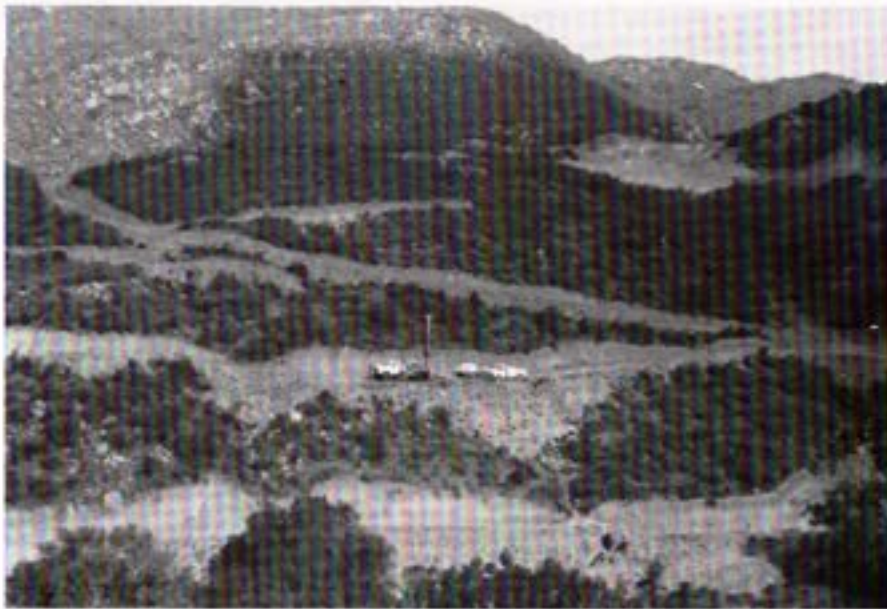
#### **Crossover Pipeline Modifications**

Plans and specifications were prepared for the modification of the terminal metering facilities and vent structures on the Crossover Pipeline. The purpose of these improvements is to increase the capacity of the Crossover Pipeline whereby the two pipelines of the First Aqueduct can be fully replenished and meet the raw water demand of the City of Escondido.

The plans and specifications were printed and delivered to the Authority on June 28, 1984 for distribution and bidding on September 6, 1984.



Core drilling for determination of the depth and strength of foundation rock at the north abatement and looking across at the south abatement.



Access to the various levels of both abatement required building a number of roads.



Pipeline 4A required extensive rock drilling and blasting prior to excavation of the trench.



Another view of Pipeline 4A showing the pioneering, drilling and blasting near a highly developed commercial area.

## LEGAL DEPARTMENT

Principal responsibility for legal advice and representation comes from the General Counsel. Other members of the firm, Jennings, Engstrand & Henrikson, provide assistance from time to time. Mr. Wallace R. Peck generally assists in all areas and Mr. Ronald L. Endeman handles condemnation matters.

### Routine Matters

Seven directors were reappointed (Archibald, Campo, Crownover, Eggert, Emerson, Hennigar and Maerkle), and one new director (Ferrara) was appointed during the year.

The Authority gained an additional seat on the Board of Directors of the Metropolitan Water District of Southern California. Ms. Francesca M. Krauel was appointed by Chairman Lessard and approved by the Board.

In October, Mr. Burzell resigned as General Manager and Chief Engineer. He continued to serve until February 1984 when Mr. Lawrence R. Michaels became the General Manager and Chief Engineer.

Two concurrent annexations (Palo Verde Ranch and Thweatt) to the Authority and Metropolitan occurred during the year.

Some minor litigation regarding right-of-way matters was settled. Litigation involving Metropolitan was monitored, but there was no active litigation involving the Authority.

### MWD Relationships

The report, A Study of Potential Water Supply for San Diego County, July 1983, prepared under the direction of the General Manager, highlighted the tremendous importance of the relationships between the Authority and MWD.

Two areas of controversy, (i) allocation of costs and (ii) allocation of water during a water shortage emergency, absorbed considerable time during the year. AB 322 (Roos) would have limited MWD's tax rate to the 1982-1983 level. The limitation was repealed by SB 1445 (Presley) after lengthy discussions at MWD about a proper range for tax rates in providing revenues for MWD's operations. The City of Los Angeles, which requires a minor part of its water supply (around 5%) from MWD and includes property with high assessed valuations, has historically sought to increase the share of total MWD costs that is borne by water charges.

The repeal occurred following agreement at MWD that a continuing shift from tax revenues to water charge revenues would occur and that after fiscal year 1990-1991 the tax rate would be limited to the amount needed to pay general obligation bonded indebtedness plus payments to the State to cover the bonds issued by the State to finance facilities constructed for the benefit of MWD.

Assemblyman Peace (AB 2619) and Senator Ellis (SB 2192) introduced legislation which, among other matters, would have repealed section 135 (Preferential Rights) of the MWD Act. Although the MWD Board approved a compromise which would have credited payments made for both water charges and taxes

toward the preferential right to purchase (section 135 now limits credits to prior tax payments), Los Angeles succeeded in preventing passage during the last days of the session in August, 1984.

### Pamo Project

The work on the environmental assessment process was concluded during the year. The draft study was completed in November. Public hearings were held in January and April, and the Final Environmental Impact Report was approved in April. Also, the project was approved in April and arrangements were being made to call a revenue bond election at the November election.

### Water Supply

An unsuccessful effort was made by Governor Deukmejian to secure legislative approval of a series of bills, called the "Water Package." The bills included SB 1369 (Ayala), SB 2196 (Boatright), SB 2146 (Doolittle), AB 3542 (Katz), AB 3626 (Arcias), AB 3758 (Herger), AB 3907 (Costa), AB 3611 (Brown) and SB 1500 (Keene). The water package would have included approval for a through delta plan for moving water from the Sacramento River to the SWP and CVP pumping plant facilities. Undoubtedly, this second-best plan for meeting the manifold problems related to the management of the movement and diversion of water through and from the Delta will receive further study before another attempt is made to improve the capability of the SWP.

Interest was increasing to attempt to enhance the supply available from Colorado River sources. The possibility of securing significant firm supplies from conservation programs within the California agricultural agencies (Coachella Valley Water District, Imperial Irrigation District and Palos Verde Irrigation District) appeared to be likely.

## TREASURER'S REPORT

Henry G. Lozano, the San Diego County Water Authority Treasurer, is responsible for all funds not immediately required for the conduct of business. Funds are invested under Board policy in interest bearing bank time deposits, and in savings accounts.

A monthly report is presented to the Board of Directors that shows monthly activity consistent with investment policy. The report outlines investments by amount, type, rate, institution, number of days invested and maturity date. As part of the monthly report to the Board of Directors, each investment during the month is listed showing the referenced information together with list of institutions bidding for the funds and the rates quoted.

The Administrative Code requires the Treasurer to report a summary of financial transactions monthly and for each fiscal year-end. For fiscal 1983-84, the Statement of Earnings is as follows:

For the fiscal year ending June 30, 1984, total Water Authority income was \$75,632,508. Total disbursements during the year were \$68,634,110. At the fiscal year end, the Treasurer had control of funds and investments totaling \$22,611,479.

## STATEMENT OF EARNINGS

Income was as follows:	1983	1984
Water sales	\$38,289,383	\$67,058,369
Taxes	6,852,252	6,811,121
Interest on investments	2,266,386	1,961,079
Tijuana water service	—	—
Miscellaneous	(60,780)	(198,061)
Total income	\$47,347,241	\$75,632,508

## Disbursements were as follows:

Water purchases	\$35,627,652	\$63,322,563
Operation and maintenance	2,007,850	2,280,373
Interest expense	1,198,608	3,031,174
Total disbursements	\$38,834,110	\$68,634,110
Net earnings before depreciation	\$ 8,513,131	\$ 6,998,398

As of June 30, 1984, the Treasurer's cash accountability was as follows:

Demand deposits	\$ 34,260	\$ 36,028
Time deposits	17,098,000	22,575,000
Total deposits	\$17,132,260	\$22,611,479

## METROPOLITAN WATER DISTRICT MEMBERSHIP

Due to the close relationship between The Metropolitan Water District of Southern California (MWD) and the San Diego County Water Authority, readers of this report are given the following brief description of MWD's organization and operations.

The Metropolitan Water District Act was approved by the State Legislature in 1927. Early the following year, MWD was organized. The original act provided for membership by cities. An amendment passed by the Legislature permitted annexation of water districts, and MWD's membership now includes 13 original cities, one city added in 1971, 12 municipal water districts, and the San Diego County Water Authority.

The Authority joined MWD on December 17, 1946, one of the 27 member agencies of that District. The two agencies have been working closely together since their association began. The MWD Act and the County Water Authority Act are very similar. Under each act, policy is established by a board of directors which represents the member agencies. Each director is appointed by the chief executive officer of the agency represented with approval from its legislative body. Under present MWD policy, each member agency is entitled to a minimum of one director. An additional representative may be appointed for each full three percent of the total MWD assessed valuation which lies within the member agency's boundaries. The district member agencies are listed in Figure D.

The Authority began the fiscal year with five representatives and ended the fiscal year with six representatives on the Metropolitan Board of Directors. All were members of the Authority Board. Director Hans H. Doe has served on the MWD Board for 25 years and is Vice Chairman of the Water Problems Committee, and a member of the Organization and Personnel Committee, and the Executive Committee.

Harry Griffen has served on the MWD Board for 21 years. He is a member of the Finance and Insurance Committee, Chairman of its Audit Subcommittee, a member of the Special Budget Committee, Nominating Committee, and Water Problems Committee.

John M. Cranston, who has been an MWD Director for nine years, is the Vice Chairman of the Board of Directors, and Vice Chairman of the Executive Committee. He is also a member of the Legal and Claims Committee, and the Engineering and Operations Committee.

John Starkey has been a member of the Board for four years. He serves on the Finance and Insurance Committee and the Land Committee.

Michael D. Madigan who has been an MWD Director for two years, serves on the Engineering and Operations Committee, Land Committee, Energy Committee, is Chairman of the Special Committee for Communication Study, and is a member of the Energy Subcommittee.

Francesca Krauel was appointed to the Metropolitan Water District Board of Directors on October 13, 1983, to fill a new directorship position. Her term expires December 31, 1986. Ms. Krauel serves on the Organization and Personnel Committee, Land Committee, and the Subcommittee to Review Applications for Position of General Manager.

As of June 30, 1984, the Authority representatives had a total of 5,537 votes out of 36,586 or 15.1 percent of the total voting strength of MWD. The delegation of each member agency is entitled to cast one vote for each \$10 million or major fraction thereof of assessed valuation within the agency's boundaries.



by MWD: F. E. Weymouth Memorial Filtration Plant at La Verne, Robert B. Diemer Filtration Plant at Yorba Linda, and Joseph Jensen Filtration Plant at Granada Hills. Each of these plants has a 400 mgd rated capacity. The Jensen Plant can only receive water from the West Branch of the California Aqueduct.

**Tax Rate**

During fiscal year 1983-84, MWD set its tax rate at 0.0237 percent of assessed valuation for the 1984-85 fiscal year. When the Authority annexed to MWD in 1946, the tax rate was 50 cents per \$100 assessed valuation. The tax rate for each year from that time is shown in Table 12. The total MWD tax levy during the year, including regular and special taxes, was approximately \$97,197,140 of which \$14,100,694, or 14.51 percent, was levied against property within the Authority.

**COLORADO RIVER BOARD MEMBERSHIP**

The Colorado River Board of California is an agency of the State devoted to the protection of California rights to Colorado River water.

The Board members were originally selected by the Governor from a list of persons submitted by each of the six agencies that depend on Colorado River water. However, the Board was reorganized in April 1977 pursuant to legislation enacted in 1976. The revised act provides that the Governor shall appoint both a member and an alternate member to the Board from a list of at least three nominees designated by each of the six agencies.

Two State officers, the Director of the Department of Fish and Game and the Director of the Department of Water Resources, are ex officio members. In addition, the Governor may appoint three public members.

The six agencies are: San Diego County Water Authority, Metropolitan Water District, City of Los Angeles Department of Water and Power, Coachella Valley County Water District, Palo Verde Irrigation District, and Imperial Irrigation District. John M. Cranston represents the Authority on the Board.

Once fully financed by the State, the Board now receives only one-third of its support from that source. The six agencies provide the balance of the required financial support for the Board.

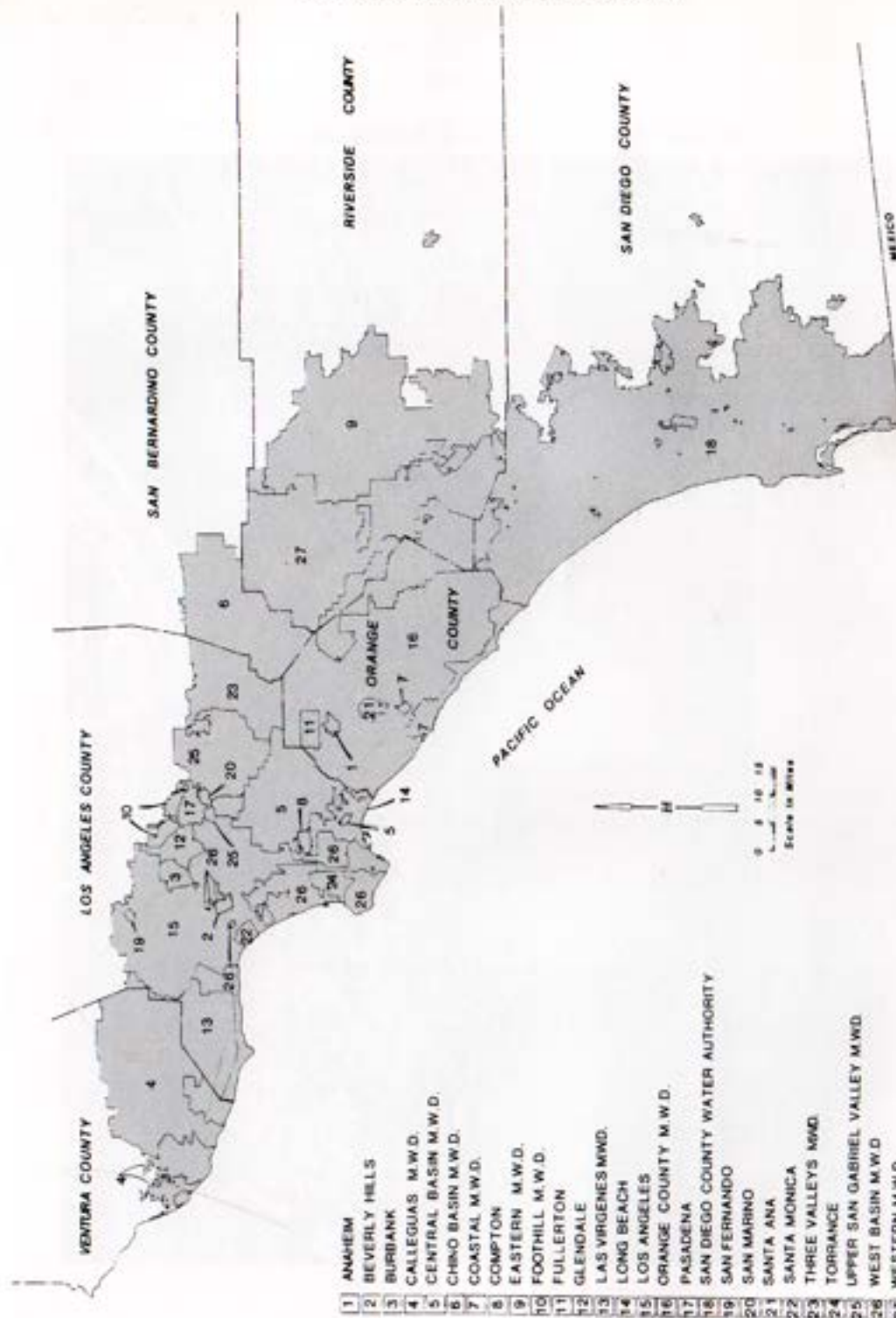


Figure E. Member Agencies of Metropolitan Water District



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Table 1  
STATISTICAL SUMMARY

	1982-83	1983-84	Percent Change
<b>GROWTH OF AREA</b>			
Number of Agencies	24	24	-0-
Total Area — Acres	899,578	902,224	+ 0.3
Population	1,934,587	2,006,239	+ 3.7
Assessed Valuation	52,778,924,886	57,524,061,587	+ 9.0
<b>OPERATIONS</b>			
Water Imported by Authority-ac. ft.	299,523	370,231	+ 23.6
Water Production of Agencies-ac. ft.	462,357*	540,262*	+ 16.8
Local Water Used-ac. ft.	143,374*	173,932*	+ 21.3
Authority Water Used-ac. ft.	320,343	368,024	+ 14.9
Miles of Pipeline	221	221	-0-
Miles of Patrol Roads Maintained	105	106	+ 1.0
Number of Service Connections	75	75	-0-
<b>FINANCIAL</b>			
<b>Revenues:</b>			
Water Revenue	38,289,383	67,058,369	+ 75.1
Other Revenue	2,205,606	1,763,018	- 20.1
Taxes	6,852,252	6,811,121	- 0.6
<b>Expenditures:</b>			
Operation and Maintenance	2,007,850	2,280,373	+ 13.6
Purchase of Water	35,627,652	63,322,563	+ 77.7
Payments on Outstanding Debt	2,489,575	3,589,575	+ 44.2
<b>Total Investment in Plant:</b>			
Total Fixed Assets	123,154,145	125,794,871	+ 2.1
Long-Term Debt	61,177,510	57,587,935	- 5.9

\*Does not include Pendleton Military Reservation

Table 2  
POPULATION GROWTH — COUNTY AND AUTHORITY AREA

Year (as of April 1)	1910 to 1984 (Includes Resident Military Personnel)				Percent of County Population in Authority
	COUNTY		AUTHORITY		
	Total Population (1)	Annual Growth	Total Population	Annual Growth	
1910 .....	61,665				
1920 .....	112,248	5,058			
1930 .....	209,659	9,741			
1940 .....	289,348	7,969			
1946 ..... (3)	502,804	26,746	(3) 440,659	2,807	88
1950 .....	556,808	42,478	(2) 451,886	50,083	81
1955 ..... (4)	769,200	52,762	(2) 702,300	50,820	91
1960 .....	1,033,010	32,198	(2) 956,400	38,720	93
1965 ..... (4)	1,194,000	23,360	(5) 1,150,000	21,000	96
1970 .....	1,310,800	49,850	(5) 1,255,000	54,500	96
1975 ..... (6)	1,560,038	49,632	(5) 1,527,520	54,027	98
1980 .....	1,808,200	91,800	(5) 1,797,655	66,635	99
1981 ..... (7)	1,900,000	44,000	(5) 1,864,290	25,075	98
1982 ..... (7)	*1,944,000	42,035	(5) 1,889,365	45,222	97
1983 ..... (7)	1,986,035	54,853	(5) 1,934,587	71,652	97
1984 ..... (7)	2,040,888		(5) 2,006,239		98

(1) County population from U.S. Census Bureau Reports.

(2) Authority population based on U.S. Census Bureau Reports.

(3) Based on Special Census, U.S. Census Bureau, exclusive of emergency military personnel due to World War II.

(4) Estimated by the San Diego Chamber of Commerce.

(5) Estimated by Authority member agencies.

(6) Population by Special Census.

(7) Population estimates by Integrated Planning Office, San Diego County.

\*Corrected estimate by Integrated Planning Office, San Diego County.

Table 3  
AREA — AUTHORITY MEMBER AGENCIES

Member Agencies	Area Within Authority			Percent of Total Authority Area 6/30/84
	As of 6/30/83 (acres)	Changes During Year (acres)	As of 6/30/84 (acres)	
Bueno Colorado M.W.D. .... (2)	19,827	+ 4	19,831	2.20
In City of Vista .....	(11,009)		*(9,352)	(1.04)
Costa Real M.W.D. .... (3)	20,369	-0-	20,369	2.26
In City of Carlsbad .....	(19,020)		(19,018)	(2.11)
Del Mar, City of .....	1,159	-0-	1,159	0.13
De Luz Heights M.W.D. ....	11,830	-41	11,789	1.31
Escondido, City of .....	16,127	+22	16,149	1.79
Fallbrook Public Utility Dist. ....	16,109	+41	16,150	1.79
Helix Water District .....	31,663	-0-	31,663	3.51
In City of El Cajon .....	(9,094)		(9,052)	(1.00)
In City of La Mesa .....	(5,760)		(5,762)	(0.64)
In City of Lemon Grove .....	(2,432)		(2,515)	(0.28)
National City .....	5,479	-0-	5,479	0.61
Oceanside, City of .....	25,689	-0-	25,689	2.85
Olivenhain M.W.D. .... (5)	27,112	+45	27,157	3.01
Otay W.D. .... (6)	64,783	+2,025	66,808	7.40
Padre Dam M.W.D. .... (8)	54,090	+28	54,118	6.00
In City of Santee .....	—	—	(10,574)	(1.17)
Pendleton Military Res .....	134,625	-0-	134,625	14.92
Poway, City of .....	22,809	-0-	22,809	2.53
Rainbow M.W.D. .... (10)	46,487	+395	46,882	5.20
Ramona M.W.D. ....	46,939	-10	46,929	5.20
Rincon del Diablo M.W.D. .... (7)	13,784	+975	14,759	1.63
San Diego, City of .....	206,027	+148	206,175	22.85
San Dieguito Water District .....	5,637	+2	5,639	0.62
San Marcos C.W.D. .... (15)	28,531	-1039	27,492	3.05
In City of San Marcos .....	(13,940)		(14,000)	(1.55)
Santa Fe Irrigation District .....	10,155	-2	10,153	1.12
South Bay Irrigation District .... (9)	15,505	+18	15,523	1.72
In City of Chula Vista .....	(15,878)		(15,878)	(1.76)
Valley Center M.W.D. .... (11)	62,029	+35	62,064	6.88
Yuima M.W.D. ....	12,813	-0-	12,813	1.42
Total Authority Area .....	899,578	+2,646	902,224	100.00
San Diego County .....			2,725,100	

- (1) Includes San Marcos C.W.D. which became a member agency of Authority on February 25, 1980.
- (2) Does not include 2,806 acres overlapping in City of Oceanside, and 37 acres overlapping in City of Escondido.
- (3) Does not include 34 acres overlapping in City of Oceanside.
- (4) Does not include 3 acres overlapping in City of San Diego.
- (5) Does not include 25 acres overlapping in City of San Diego.
- (6) Does not include 726 acres overlapping in City of San Diego.
- (7) Does not include 11,945 acres overlapping in City of Escondido and 39 acres overlapping in City of San Diego.
- (8) Does not include 12 acres overlapping in City of San Diego.
- (9) Does not include 297 acres overlapping in City of San Diego and 673 acres overlapping in National City.
- (10) Does not include 701 acres overlapping in City of Oceanside.

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

Population — U.S. Census					Density of Population 1984	
1970 (13)	1980 (13)	Decade Increase 1970-80 Percent	1984 Estimate (14)	Annual Increase 1983-84 Percent	Per Acre	Per Sq. Mile
39,000(1)	51,000	31	55,864	3.6	2.82	1,803
(24,600)	(35,800)	(46)	(41,945)	(2.8)	(4.49)	(2,870)
15,500	31,500	103	38,866	3.7	1.91	1,221
(14,850)	(35,000)	(136)	(40,486)	(3.7)	(2.13)	(1,362)
3,900	5,040	29	5,162	0.7	4.45	2,850
150	225	50	250	-0-	0.02	14
36,000	64,100	78	74,785	2.3	4.63	2,964
12,000	18,700	56	19,970	0.5	1.24	791
163,000	203,500	25	209,791	0.9	6.63	4,240
(50,900)	(72,100)	(42)	(79,961)	(1.6)	(8.83)	(5,653)
(38,800)	(45,900)	(18)	(52,410)	(4.2)	(9.10)	(5,821)
—	(20,400)	(—)	(21,804)	(0.8)	(8.67)	(5,549)
39,000	47,200	21	49,000	1.0	8.94	5,724
40,700	77,800	91	87,142	3.7	3.39	2,171
2,000	23,000	1,050	28,500	11.3	1.05	672
19,400	51,600	166	59,950	7.1	0.90	574
46,000	89,000	93	103,111	4.4	1.91	1,219
—	—	—	(45,983)	—	(4.35)	(2,783)
—	33,150	—	45,000	32.4	0.33	214
14,000	*33,620	140	36,504	3.4	1.60	1,024
4,200	7,800	86	8,800	2.3	0.19	120
6,800	16,000	135	17,700	2.3	0.38	241
18,900	13,800	-27	17,490	12.8	1.19	758
675,800	849,600	26	958,900	3.7	4.65	2,977
21,800	30,900	42	31,150	0.3	5.52	3,535
—	24,200	—	28,200	0.4	1.03	656
(3,900)	(16,500)	(323)	(18,987)	(2.5)	(1.36)	868
8,600	14,700	71	15,750	1.5	1.55	993
80,000	99,200	24	101,500	0.6	6.54	4,185
(64,500)	(82,200)	(27)	(89,375)	(1.3)	(5.63)	(3,602)
7,000	*10,200	46	11,034	1.7	0.18	114
1,250	1,820	46	1,820	-0-	0.14	91
1,255,000	*1,797,655	43	2,006,239	3.7	2.22	1,423
1,310,800	1,808,200	38	2,040,888	2.8	0.75	479

- (11) Does not include 99 acres overlapping in City of Escondido.
- (12) Includes 99 acres overlapping in Valley Center M.W.D., 1,360 acres overlapping San Marcos County W.D., 37 acres overlapping Bueno Colorado M.W.D. and 11,945 acres overlapping Rincon Del Diablo M.W.D.
- (13) Population in agencies other than cities was furnished by agencies.
- (14) Estimate by agencies.
- (15) Does not include 1,360 acres overlapping in City of Escondido.

\*Corrected figures per agencies.

Member Agencies	SOURCE OF WATER (4)				Total Water Production Ac. Ft.	Gross Area (2) Acres	VICENTE RESERVOIR OPERATIONS			
	Local Supply		Authority Supply				TOTALED WATER WITHDRAWN DURING FISCAL YEAR			Total Quantity in Storage 6/30/84 Ac. Ft.
	Amount Ac. Ft.	Percent	Amount Ac. Ft.	Percent			By Delivery Ac. Ft.	By Evaporation Ac. Ft.	By Spill Ac. Ft.	
Bueno Colorado M.W.D.	14,887.4	81.1	3,464.0	18.9	18,351.4	19,831	0-	0-	0-	0-
Costa Real M.W.D.	0-	0-	12,894.7	100.0	12,894.7	20,369	0-	111.1	0-	1,545.1
Del Mar, City of	0-	0-	1,234.6	100.0	1,234.6	1,159	0-	0-	0-	0-
De Luz Heights M.W.D.	0-	0-	2,530.9	100.0	2,530.9	11,789	0-	0-	0-	0-
Escondido, City of	10,589.8	43.7	13,623.9	56.3	24,213.7	16,140	0-	0-	0-	0-
Fallbrook P.U.D.	0-	0-	12,599.8	100.0	12,599.8	16,150	0-	111.1	0-	1,545.1
Helix W.D.	15,607.9	38.0	25,473.7	62.0	41,081.6	31,663	0-	0-	0-	0-
National City, City of	6,810.1	99.7	23.0	0.3	6,833.1	5,479	0-	0-	0-	0-
Oceanside, City of	0-	0-	22,583.3	100.0	22,583.3	25,689	0-	222.2	0-	3,090.0
Olivenhain M.W.D.	0-	0-	7,740.9	100.0	7,740.9	27,157	0-	37.2	0-	514.9
Otay W.D.	0-	0-	13,551.2	100.0	13,551.2	66,808	0-	111.1	0-	1,545.1
Padre Dam M.W.D.	0-	0-	16,991.9	100.0	16,991.9	54,118	0-	148.1	0-	2,059.9
Pendleton Military Res (3)	N.R.	—	(5) 1,694.2	—	N.R.	134,625	0-	0-	0-	0-
Poway, City of	210.3	2.3	9,004.5	97.7	9,214.8	22,809	0-	0-	0-	0-
Rainbow M.W.D.	0-	0-	31,374.5	100.0	31,374.5	46,882	0-	37.2	0-	514.9
Ramona M.W.D.	479.5	4.4	10,391.9	95.6	10,871.4	46,929	0-	148.1	0-	2,059.9
Rincon del Diablo M.W.D.	0-	0-	6,000.6	100.0	6,000.6	13,761	0-	44.4	0-	618.2
San Diego, City of (1)	96,775.6	46.1	113,015.1	53.9	209,790.7	206,175	0-	0-	0-	0-
San Dieguito W.D.	3,149.4	41.1	4,520.4	58.9	7,669.8	5,639	0-	0-	0-	0-
San Marcos C.W.D.	0-	0-	9,653.9	100.0	9,653.9	28,499	0-	37.2	0-	514.9
Santa Fe I.D.	4,721.6	44.5	5,895.0	55.5	10,616.6	10,153	0-	0-	0-	0-
South Bay I.D.	18,695.8	99.7	64.1	0.3	18,759.9	15,523	0-	0-	0-	0-
Valley Center M.W.D.	0-	0-	42,367.3	100.0	42,367.3	62,064	0-	37.2	0-	514.9
Yuima M.W.D.	2,004.4	60.1	1,330.7	39.9	3,335.1	12,813	0-	7.4	0-	103.1
Total and Average	173,931.8	32.2	366,329.9	67.8	540,261.7	902,224	0-	1,052.3	0-	14,626.0

(1) Includes production by City of San Diego for areas outside City (not in Authority).  
 (2) Does not include overlapping areas as shown in Table 1.  
 (3) Water production from local sources not reported.  
 (4) Figures include losses from transmission and distribution system but not from reservoirs.  
 (5) Not included in totals.  
 N.A. — Not Applicable; NR — Not Reported

983-84 valuation Per Acre
94,694
94,199
234,811
3,671
83,442
33,328
153,810
116,977
74,640
44,176
23,719
35,375
18,214
45,446
13,469
12,783
74,930
13,131
165,971
37,053
120,644
164,504
11,368
7,840
63,758
21,959

TABLE 4  
 WATER PRODUCTION, AGRICULTURAL USE AND AUTHORITY STORAGE  
 FISCAL YEAR 1983-84  
 (Compilation of data furnished by member agencies)

Estimated Area Served by Water System Acres	Gross Area Served by Water System Percent	Water Production Per Acre Served Ac. Ft./Acre/Yr.	Estimated Population	Water Production Per Capita Ac. Ft./Cap./Yr.	WATER USED FOR AGRICULTURAL PURPOSES					Percent of Agricultural Water to Total Production	Total Quantity in Storage 6/30/83 Ac. Ft.	SAN VICENTE RESERVOIR OPERATIONS				
					From Local Supply		From Authority		Total Ac. Ft.			Placed into Storage During Fiscal Year Ac. Ft.	STORED WATER WITHDRAWN DURING FISCAL YEAR			Total Quantity in Storage 6/30/84 Ac. Ft.
					Ac. Ft.	Percent	Ac. Ft.	Percent					By Delivery Ac. Ft.	By Evaporation Ac. Ft.	By Spill Ac. Ft.	
16,258	82.0	1.13	55,864	0.33	3,105.3	78.7	841.5	21.3	3,946.8	21.5	-0-	-0-	-0-	-0-	-0-	-0-
17,540	86.1	0.74	38,866	0.33	-0-	-0-	3,591.9	100.0	3,591.9	27.9	1,608.5	47.7	-0-	111.1	-0-	1,545.1
1,125	97.1	1.10	5,162	0.24	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
2,550	21.6	0.99	250	10.12	-0-	-0-	2,471.5	100.0	2,471.5	97.7	-0-	-0-	-0-	-0-	-0-	-0-
12,438	77.1	1.95	74,785	0.32	3,638.0	46.9	4,120.8	53.1	7,758.8	32.0	-0-	-0-	-0-	-0-	-0-	-0-
10,852	67.2	1.16	19,970	0.63	-0-	-0-	8,005.8	100.0	8,005.8	63.5	1,608.5	47.7	-0-	111.1	-0-	1,545.1
30,081	95.0	1.37	209,791	0.20	254.4	36.5	442.1	63.5	696.5	1.7	-0-	-0-	-0-	-0-	-0-	-0-
4,560	83.2	1.50	49,000	0.14	1.4	100.0	-0-	-0-	1.4	-0-	-0-	-0-	-0-	-0-	-0-	-0-
16,461	64.1	1.37	87,142	0.26	-0-	-0-	4,915.4	100.0	4,915.4	21.8	3,216.7	95.5	-0-	222.2	-0-	3,090.0
14,250	52.5	0.54	28,500	0.27	-0-	-0-	1,715.0	100.0	1,715.0	22.2	536.2	15.9	-0-	37.2	-0-	514.9
32,215	48.2	0.42	59,950	0.23	-0-	-0-	2,018.4	100.0	2,018.4	14.9	1,608.5	47.7	-0-	111.1	-0-	1,545.1
34,196	63.2	0.50	103,111	0.16	-0-	-0-	1,067.4	100.0	1,067.4	6.3	2,144.4	63.6	-0-	148.1	-0-	2,059.9
N.A.	—	—	45,000	—	—	—	—	—	—	—	-0-	-0-	-0-	-0-	-0-	-0-
7,331	32.1	1.26	36,504	0.25	28.6	2.0	1,396.0	98.0	1,424.6	15.5	-0-	-0-	-0-	-0-	-0-	-0-
17,400	37.1	1.80	8,800	3.57	-0-	-0-	27,738.1	100.0	27,738.1	88.4	536.2	15.9	-0-	37.2	-0-	514.9
10,957	23.3	0.99	17,700	0.61	291.2	4.3	6,496.3	95.7	6,787.5	62.4	2,144.4	63.6	-0-	148.1	-0-	2,059.9
7,634	55.5	0.79	17,490	0.34	-0-	-0-	1,452.8	100.0	1,452.8	24.2	643.5	19.1	-0-	44.4	-0-	618.2
108,743	52.7	1.93	958,900	0.22	-0-	-0-	2,128.0	100.0	2,128.0	1.0	-0-	-0-	-0-	-0-	-0-	-0-
5,285	93.7	1.45	31,150	0.25	772.0	39.4	1,186.5	60.6	1,958.5	25.5	-0-	-0-	-0-	-0-	-0-	-0-
20,900	73.3	0.46	28,200	0.34	-0-	-0-	3,265.8	100.0	3,265.8	33.8	536.2	15.9	-0-	37.2	-0-	514.9
10,153	100.0	1.05	15,750	0.67	614.1	46.5	706.8	53.5	1,320.9	12.4	-0-	-0-	-0-	-0-	-0-	-0-
11,380	73.3	1.65	101,500	0.18	192.6	99.7	0.6	0.3	193.2	1.0	-0-	-0-	-0-	-0-	-0-	-0-
28,501	45.9	1.49	11,034	3.84	362.8	1.0	37,788.1	99.0	38,150.9	90.0	536.2	15.9	-0-	37.2	-0-	514.9
4,120	32.2	0.81	1,820	1.83	1,957.8	60.1	1,300.4	39.9	3,258.2	97.7	107.2	3.3	-0-	7.4	-0-	103.1
424,930	47.1	1.27	2,006,239	0.27	11,218.2	9.1	112,649.2	90.9	123,867.4	22.9	15,226.5	451.8	-0-	1,052.3	-0-	14,626.0

TABLE 5  
 ASSESSED VALUATION AND TAX COLLECTIONS  
 FISCAL YEAR 1983-84

Member Agencies	ASSESSED VALUATION — SECURED AND UNSECURED				Area 6/30/84  Acres	1983-84 Valuation Per Acre	Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/84	Tax Collections	Interest & Penalties
	*1982-83  Total	*1983-84  Total	1982-83 to 1983-84 Percent Change	*1984-85  Total							
Bueno Colorado M.W.D.	\$ 1,757,817,482	\$ 1,877,874,244	+ 6.8	\$ 2,091,236,875	19,831	\$ 94,694	\$ 2,724,927	\$ (17,474)	\$ 126,250	\$ 2,581,202	\$ 17,691
Costa Real M.W.D.	1,753,742,160	1,918,749,078	+ 9.4	2,161,100,052	20,369	94,199	2,777,941	(103,529)	38,393	2,636,018	16,088
Del Mar, City of	253,579,080	272,146,251	+ 7.3	308,371,620	1,159	234,811	603,695	(2,330)	11,635	589,730	4,091
De Luz Heights M.W.D.	38,783,874	43,281,854	+ 11.6	46,566,950	11,789	3,671	62,351	(2,000)	2,560	57,791	559
Escondido, City of	1,271,163,154	1,346,757,293	+ 5.9	1,492,068,191	16,140	83,442	2,400,038	(15,663)	67,873	2,316,503	11,518
Fallbrook P.U.D.	511,776,452	538,254,402	+ 5.2	589,251,066	16,150	33,328	957,404	(3,142)	29,756	924,506	4,614
Helix W.D.	4,635,342,990	4,870,077,608	+ 5.1	5,203,170,801	31,663	153,810	10,441,616	(49,463)	220,544	10,171,609	34,704
National City, City of	608,157,467	640,918,086	+ 5.4	718,607,895	5,479	116,977	1,768,655	6,804	20,867	1,754,593	4,571
Oceanside, City of	1,771,748,419	1,917,433,070	+ 8.2	2,150,695,223	25,689	74,640	2,984,898	(17,477)	117,382	2,850,040	13,264
Olivenhain M.W.D.	1,103,285,954	1,199,680,406	+ 8.7	1,372,208,259	27,157	44,176	1,215,748	(23,965)	105,435	1,086,348	9,715
Otay W.D.	1,460,050,033	1,584,622,361	+ 8.5	1,757,423,453	66,808	23,719	2,113,996	(22,379)	117,915	1,973,702	11,258
Padre Dam M.W.D.	1,801,244,162	1,914,403,180	+ 6.3	2,103,810,155	54,118	35,375	2,899,002	(25,202)	123,540	2,750,260	19,501
Pendleton Military Res.	1,664,602,719	2,451,994,415	+ 47.3	2,610,324,315	134,625	18,214	1,302,746	(75,367)	358,039	869,340	—
Poway, City of	981,195,087	1,036,588,977	+ 5.6	1,127,422,148	22,809	45,446	1,421,653	(12,016)	71,631	1,338,006	11,774
Rainbow M.W.D.	596,376,119	631,444,513	+ 5.9	679,897,834	46,882	13,469	1,029,083	(34,554)	10,104	984,425	11,925
Ramona M.W.D.	566,560,620	599,881,518	+ 5.9	641,771,837	46,929	12,783	867,020	11,331	(29,134)	907,485	7,421
Rincon Del Diablo M.W.D.	971,223,754	1,031,115,559	+ 6.2	1,126,250,503	13,761	74,930	1,544,593	62,493	152,244	1,454,842	8,709
San Diego, City of	24,887,567,567	27,072,432,702	+ 8.8	30,482,428,659	206,175	13,131	54,405,678	(38,424,254)	(1,440,015)	17,421,439	37,838
San Dieguito W.D.	864,191,659	935,911,104	+ 8.3	1,035,324,539	5,639	165,971	1,570,412	(7,633)	52,629	1,510,150	5,901
San Marcos C.W.D.	989,571,993	1,055,972,761	+ 6.7	1,159,884,259	28,499	37,053	1,433,238	(13,363)	36,606	1,383,269	2,362
Santa Fe I.D.	1,112,948,557	1,224,900,846	+ 10.1	1,409,934,625	10,153	120,644	1,791,688	(3,710)	63,001	1,724,976	7,356
South Bay I.D.	2,417,699,041	2,553,603,199	+ 5.6	2,703,736,889	15,523	164,504	5,646,033	(654,376)	(114,619)	5,106,276	12,110
Valley Center M.W.D.	664,247,461	705,564,091	+ 6.2	754,119,401	62,064	11,368	1,024,870	(1,566)	57,211	966,093	9,233
Yuima M.W.D.	96,049,082	100,454,069	+ 4.6	106,219,951	12,813	7,840	230,683	(1,703)	5,225	223,754	1,020
Total Authority	\$52,778,924,886	\$57,524,061,587	+ 9.0	\$63,831,825,500	902,224	\$ 63,758	\$103,217,968	\$(39,430,538)	\$ 205,072	\$63,582,357	\$263,223
San Diego County (1)	\$54,937,677,472	\$59,839,543,777	+ 8.9	\$66,347,388,592	2,725,100	\$ 21,959					

(1) Excluding 1,475,100 acres of tax exempt lands in San Diego County.  
 \* Market value as determined by County Assessor.

Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/84	Tax Collections	Interest & Penalties	Receipts in Lieu of Taxes	Misc. Tax Sales	Net Total Collections	Amount Paid for Service Connections to 6/30/84	Total Contributions Paid and Contracted for
\$ 2,724,927	\$ (17,474)	\$ 126,250	\$ 2,581,202	\$ 17,691	\$ 10,803	\$ 124	\$ 2,609,820	\$ 207,438	\$ 2,817,258
2,777,941	(103,529)	38,393	2,636,018	16,088	33,275	11	2,685,393	7,931	2,693,324
603,695	(2,330)	11,635	589,730	4,091	530	1	594,352	—	594,352
62,351	(2,000)	2,560	57,791	559	1,000	—	59,350	—	59,350
2,400,038	(15,663)	67,873	2,316,503	11,518	29	29	2,328,079	9,253	2,337,332
957,404	(3,142)	29,756	924,506	4,614	3,420	43	932,583	67,773	1,000,356
10,441,616	(49,463)	220,544	10,171,609	34,704	4,930	784	10,212,027	28,905	10,240,932
1,768,655	6,804	20,867	1,754,593	4,571	6,828	96	1,766,088	—	1,766,088
2,984,898	(17,477)	117,382	2,850,040	13,264	2,601	100	2,866,005	106,369	2,972,374
1,215,748	(23,965)	105,435	1,086,348	9,715	1,250	—	1,097,313	66,608	1,163,921
2,113,996	(22,379)	117,915	1,973,702	11,258	4,455	45	1,989,460	208,573	2,198,033
2,899,002	(25,202)	123,540	2,750,260	19,501	3,003	132	2,772,896	45,244	2,818,140
1,302,746	(75,367)	358,039	869,340	—	—	—	869,340	—	869,340
1,421,653	(12,016)	71,631	1,338,006	11,774	15	9	1,349,804	103,875	1,453,679
1,029,083	(34,554)	10,104	984,425	11,925	23,679	2	1,020,031	152,685	1,172,716
867,020	11,331	(29,134)	907,485	7,421	5,400	59	920,365	3,378	923,743
1,544,593	62,493	152,244	1,454,842	8,709	58,801	1	1,522,353	14,527	1,536,880
54,405,678	(38,424,254)	(1,440,015)	17,421,439	37,838	38,316,800	2,467	55,778,544	426,983	56,205,527
1,570,412	(7,633)	52,629	1,510,150	5,901	5,426	131	1,521,608	47,205	1,568,813
1,433,238	(13,363)	36,606	1,383,269	2,362	—	—	1,385,631	—	1,385,631
1,791,688	(3,710)	63,001	1,724,976	7,356	2,892	1,914	1,737,138	58,787	1,795,925
5,646,033	(654,376)	(114,619)	5,106,276	12,110	629,977	143	5,748,506	594	5,749,100
1,024,870	(1,566)	57,211	966,093	9,233	1,011	26	976,363	162,554	1,138,917
230,683	(1,703)	5,225	223,754	1,020	1,500	—	226,274	28,424	254,698
\$103,217,968	\$(39,430,538)	\$ 205,072	\$63,582,357	\$263,223	\$39,117,625	\$6,118	\$102,969,323	\$1,747,106	\$104,716,429

Table 6  
WATER PRODUCTION WITHIN AUTHORITY AGENCIES — FISCAL YEARS 1974-75 to 1983-84  
(All Figures in Acre Feet)

Member Agencies	From Local and Authority Supplies									
	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Bueno Colorado M. W. D. ....	12,897	15,178	13,928	13,263	14,554	15,038	17,565	15,446	14,720	18,351
Costa Real M. W. D. ....	10,022	10,965	10,752	10,010	11,135	12,554	13,385	12,749	11,879	12,895
Del Mar, City of ....	893	1,162	918	921	1,096	999	1,075	1,045	1,055	1,235
De Luz Heights M. W. D. ....	178	362	503	612	990	1,339	1,757	1,794	1,792	2,531
Escondido, City of ....	18,181	21,828	19,740	19,001	20,500	22,113	26,052	22,534	20,269	24,214
Fallbrook Public Utility Dist. ....	11,524	13,429	12,999	11,128	11,667	12,174	14,698	12,386	10,156	12,600
Helix Water District ....	33,807	37,724	34,465	32,882	36,256	37,676	41,613	39,284	36,519	41,081
National City & South Bay I.D. ....	20,065	22,038	21,339	20,021	21,628	21,519	23,222	23,209	23,252	25,593
Oceanside, City of ....	14,817	17,358	16,565	15,851	18,310	19,602	22,408	21,769	19,846	22,583
Olivenshain M. W. D. ....	2,697	4,079	3,739	4,358	4,714	5,313	6,437	5,856	6,027	7,741
Otay W. D. ....	10,970	12,927	11,787	11,846	11,270	11,852	13,612	12,943	11,952	13,551
Padre Dam M. W. D. ....	10,785	12,011	11,623	11,799	12,812	13,718	15,572	14,908	14,102	16,992
Pendleton Military Res. ....	—	—	—	—	—	—	—	—	—	—
Poway, City of ....	7,335	7,983	7,177	6,553	6,948	8,240	9,027	7,873	7,547	9,215
Rainbow M. W. D. ....	20,687	25,472	25,824	22,529	24,709	26,943	34,111	28,630	25,354	31,374
Ramona M. W. D. ....	4,086	5,482	5,653	5,531	6,269	6,583	9,065	8,873	8,679	10,871
Rincon del Diablo M. W. D. ....	3,328	4,080	3,914	3,926	4,483	4,789	5,763	5,256	4,374	6,001
San Diego, City of: .....										
Inside City .....	153,724	167,392	162,003	155,226	164,934	175,668	191,713	192,626	182,873	203,642
Outside City (not in Authority) .....	6,304	7,887	7,367	6,023	6,866	4,480	6,964	5,657	3,723	6,149
San Diegoito Water District .....	5,811	7,167	7,058	6,452	7,170	7,342	8,056	7,668	7,298	7,670
San Marcos C. W. D. ....	4,580	5,274	5,535	5,562	6,559	6,800	8,420	8,233	7,847	9,654
Santa Fe Irrigation District .....	7,171	8,951	7,517	7,254	7,735	10,252	9,368	8,792	7,728	10,617
Valley Center M. W. D. ....	20,353	29,198	28,895	26,738	29,417	33,568	44,687	38,358	32,583	42,367
Yuima M. W. D. ....	4,251	4,263	3,729	3,335	2,987	2,978	3,891	3,498	2,782	3,335
Total .....	384,457	442,210	423,030	400,821	433,009	461,540	528,461	499,387	462,357	540,262

Table 7  
WATER SALES — 1947 to 1984  
(All figures rounded to nearest whole acre foot)

Member Agencies	From Local and Authority Supplies									
	1947-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Total
Bueno Colorado M. W. D. ....	137,485	10,258	9,140	4,657	7,402	6,594	6,652	2,753	3,463	191,404
Costa Real M. W. D. ....	135,915	10,761	10,011	11,162	12,223	13,308	12,749	12,895	12,895	230,903
Del Mar, City of ....	8,834	918	921	1,095	1,283	1,076	1,045	1,055	1,235	17,462
De Luz Heights M. W. D. ....	648	533	552	620	1,097	1,627	1,794	1,792	2,531	11,194
Escondido, City of ....	121,079	17,670	11,825	6,637	8,749	12,880	15,969	8,342	14,634	217,975
Fallbrook Public Utility District .....	240,178	12,895	11,298	11,604	12,174	14,698	12,363	10,168	12,600	337,978
Helix Water District .....	549,897	37,232	28,350	19,198	19,800	24,413	29,577	22,898	24,779	756,144
National City & South Bay I.D. ....	327,410	17,183	13,357	4,174	3,093	143	315	87	87	365,894
Oceanside, City of ....	173,446	16,552	15,851	17,941	19,326	22,362	21,726	19,821	22,481	329,608
Olivenshain M. W. D. ....	24,109	3,852	4,358	5,154	6,433	6,433	5,739	5,714	7,860	68,532
Otay W. D. ....	127,883	11,787	11,846	11,782	13,629	12,943	12,943	13,542	12,634	226,634
Padre Dam M. W. D. ....	108,093	11,617	11,799	12,812	13,721	15,572	14,908	14,102	16,992	220,616
Pendleton Military Res. ....	—	—	—	—	—	—	—	—	—	—
Poway, City of ....	79,237	7,649	6,304	6,942	7,053	9,269	8,351	9,005	9,005	140,650
Rainbow M. W. D. ....	268,942	26,039	22,529	24,770	27,040	33,980	28,630	25,426	31,374	488,690
Ramona M. W. D. ....	29,752	5,653	5,174	6,122	6,239	8,258	8,541	8,092	10,392	88,203
Rincon del Diablo M. W. D. ....	117,171	3,914	3,926	4,483	4,789	5,763	5,256	4,374	6,001	155,677
San Diego, City of ....	2,601,257	179,387	130,150	94,280	92,986	119,890	155,743	90,841	114,473	3,579,007
San Diegoito Water District .....	62,627	7,079	6,067	4,056	5,732	5,711	4,573	4,009	4,520	104,374
San Marcos C. W. D. ....	50,203	5,535	5,557	6,585	6,855	8,465	8,154	7,847	9,654	108,855
Santa Fe Irrigation District .....	67,747	7,531	7,162	4,634	6,258	6,630	5,278	4,426	5,895	115,561
Valley Center M. W. D. ....	195,922	29,183	26,429	28,837	32,681	44,046	38,091	32,583	42,247	470,019
Yuima M. W. D. ....	25,107	1,829	1,967	1,601	2,054	2,054	2,205	1,403	1,333	39,452
Total Sales to Agencies .....	5,453,922	425,181	344,573	289,262	307,489	377,378	404,317	297,806	369,779	8,269,707
Total Sales to Others .....	34,043	9,058	8,200	1,900	2,560	658	—	—	—	56,509
Total to Authority Storage .....	+281,951	+26,819	+21,411	+2,000	+2,000	—	+14,560	+9,100	+452	+358,293
Total from Authority Storage .....	-231,644	-26,123	-34,531	-4,533	-2,000	-2,000	-	-7,383	-	-308,214
Total to Metropolitan Storage .....	+120,929	—	—	—	—	—	—	—	—	+120,929
Total from Metropolitan Storage .....	-116,908	—	—	—	—	—	—	—	—	-116,908
Total Flow in Authority System .....	5,542,293	434,935	339,653	288,719	310,049	376,036	418,877	299,523	370,231	8,380,316
Average Rate of Flow (c.f.s.) .....										
To Agencies and Others .....	264.8	599.8	487.3	402.3	427.1	522.2	558.5	411.3	509.4	—
To Authority Storage .....	+13.6	+37.0	+29.6	+2.8	+2.8	—	+20.1	+12.6	+0.6	—
From Authority Storage .....	-11.2	-36.1	-47.7	-6.3	-2.8	-	-	-10.2	-	—
To Metropolitan Storage .....	+5.8	—	—	—	—	—	—	—	—	—
From Metropolitan Storage .....	-5.6	—	—	—	—	—	—	—	—	—
Flow in Authority System .....	267.4	600.7	469.2	398.8	427.1	519.4	578.6	413.7	510.0	—

(1) the operation of the First Aqueduct was formally initiated on November 24, 1947. For sales in intervening years, see previous reports.

TABLE 8  
SALES OF IMPORTED WATER — FISCAL YEAR 1983-84  
(All Figures in Acre-Feet except as noted)

Member Agency	Month, 1983					
	July	August	Sept.	Oct.	Nov.	Dec.
Bueno Colorado M.W.D.	699.0	665.7	518.1	65.0	-0-	0.1
Costa Real M.W.D.	1,458.0	1,383.4	1,423.4	1,010.7	683.9	544.8
Del Mar, City of	141.5	145.6	120.5	80.8	79.9	63.6
De Luz Heights M.W.D.	322.7	344.2	344.4	149.3	90.1	13.8
Escondido, City of	1,780.9	1,471.3	1,553.4	522.1	268.7	(53.0)
Fallbrook P.U.D.	1,655.2	1,581.7	1,560.8	835.2	472.2	185.9
Helix W.D.	2,858.2	2,645.4	3,167.8	2,229.7	810.2	497.3
National City & South Bay I.D.	3.5	6.8	-0-	5.1	11.1	0.5
Oceanside, City of	2,404.9	2,339.7	2,259.7	1,502.2	1,338.9	1,074.4
Olivenhain M.W.D.	883.3	890.8	824.2	597.9	537.8	268.3
Otay W.D.	1,469.3	1,471.8	1,516.4	1,153.4	836.1	563.4
Padre Dam M.W.D.	1,969.3	1,820.8	1,724.3	1,305.5	965.1	739.8
Pendleton Mil. Res.*	107.2	146.8	142.3	164.0	180.0	180.0
Poway, City of	1,113.5	893.8	766.7	834.9	407.3	344.6
Rainbow M.W.D.	3,909.1	3,794.9	3,954.8	2,136.2	1,172.8	227.2
Ramona M.W.D.	1,327.9	1,162.9	1,275.2	827.9	447.4	192.5
Rincon Del Diablo M.W.D.	728.2	667.5	671.3	416.5	282.2	179.5
San Diego, City of	13,456.5	10,910.3	10,973.6	9,493.7	6,817.2	5,028.9
San Dieguito W.D.	536.1	404.1	441.4	312.0	407.3	254.5
San Marcos C.W.D.	1,170.7	1,035.4	1,085.0	675.4	539.9	318.4
Santa Fe I.D.	773.4	557.5	599.1	416.5	443.9	200.8
Valley Center M.W.D.	5,737.0	4,625.2	5,473.0	3,054.9	1,628.3	341.4
Yuima M.W.D.	256.4	136.3	249.5	76.6	23.7	-0-
Total Sales to Agencies	44,761.8	39,101.9	40,644.9	27,865.5	18,444.0	11,166.7
Total Sales to Others	-0-	-0-	-0-	-0-	-0-	-0-
Total Sales to Agencies & Others	44,761.8	39,101.9	40,644.9	27,865.5	18,444.0	11,166.7
Total to Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-
Total From Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-
Total Flow in Authority System	44,761.8	39,101.9	40,644.9	27,865.5	18,444.0	11,166.7
Total Evaporation Losses from Storage in San Vicente and Lower Otay Reservoirs	154.8	116.1	112.0	75.9	44.5	20.5
Total Evaporation Losses from Storage in Sweetwater Reservoir	-0-	-0-	-0-	-0-	-0-	-0-
Rate of Flow (c.f.s.)						
To Agencies and Others	728.0	635.9	683.1	453.2	310.0	181.6
To Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-
From Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-
In Authority System	728.0	635.9	683.1	453.2	310.0	181.6

\*1642.6 Delivered through Coastal M.W.D. facilities and are included in Authority's totals.

Total 6 Months 1983	Month, 1984						Total 6 Months 1984	Fiscal Year Total	Fiscal Year, Average cfs
	Jan.	Feb.	March	April	May	June			
1,947.9	(1.1)	-0-	550.9	258.7	374.7	331.8	1,515.0	3,462.9	4.8
6,504.2	622.3	791.2	1,130.4	1,147.1	1,456.4	1,243.1	6,390.5	12,894.7	17.8
631.9	79.3	87.8	100.2	86.7	107.9	140.8	602.7	1,234.6	1.7
1,264.5	83.1	181.1	212.6	210.0	291.6	288.0	1,266.4	2,530.9	3.5
5,543.4	(28.8)	551.3	1,230.5	2,104.8	2,840.4	2,382.6	9,080.8	14,624.2	20.2
6,291.0	424.0	848.5	1,104.9	1,014.2	1,499.9	1,417.3	6,308.8	12,599.8	17.4
12,208.6	672.4	1,350.3	1,850.6	2,169.0	3,325.0	3,203.2	12,570.5	24,779.1	34.1
27.0	6.3	6.8	8.1	5.1	23.4	10.4	60.1	87.1	0.1
10,919.8	1,295.1	1,480.8	2,007.8	1,941.8	2,448.9	2,489.1	11,663.5	22,583.3	31.1
4,002.3	336.0	472.1	668.4	606.2	866.4	908.9	3,858.0	7,860.3	10.8
7,010.4	653.5	763.9	1,081.6	1,082.5	1,492.1	1,458.4	6,532.0	13,542.4	18.7
8,524.8	861.6	1,052.3	1,422.5	1,385.5	1,897.1	1,848.1	8,467.1	16,991.9	23.4
920.3	107.4	89.8	187.0	135.2	141.8	112.7	773.9	1,694.2	2.3
4,360.8	492.3	436.5	761.6	905.5	1,129.7	918.1	4,643.7	9,004.5	12.4
15,195.0	792.0	2,007.1	3,360.4	2,752.6	3,689.1	3,578.3	16,179.5	31,374.5	43.2
5,233.8	415.0	668.9	833.0	810.7	1,254.2	1,176.3	5,158.1	10,391.9	14.3
2,945.2	245.8	374.1	515.0	491.0	724.2	705.3	3,055.4	6,000.6	8.3
56,680.2	5,476.9	8,751.5	9,861.5	9,393.6	11,957.6	12,351.7	57,792.8	114,473.0	157.7
2,355.4	297.6	313.5	351.2	286.2	412.6	503.9	2,650.0	4,520.4	6.2
4,824.8	462.8	541.0	891.4	862.0	1,071.6	1,000.3	4,829.1	9,653.9	13.3
2,991.2	327.3	403.0	488.0	361.1	577.3	747.1	2,903.8	5,895.0	8.1
20,859.8	1,080.1	2,766.0	3,756.7	3,488.5	5,287.9	5,008.3	21,387.5	42,247.3	58.2
742.5	9.5	27.0	70.6	86.1	198.2	198.9	590.3	1,332.8	1.8
181,984.8	14,710.4	23,964.5	32,444.9	31,584.1	43,068.0	42,022.6	187,794.5	369,779.3	509.4
-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
181,984.8	14,710.4	23,964.5	32,444.9	31,584.1	43,068.0	42,022.6	187,794.5	369,779.3	509.4
-0-	-0-	-0-	-0-	-0-	-0-	+451.8	+451.8	+451.8	+0.6
-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
181,984.8	14,710.4	23,964.5	32,444.9	31,584.1	43,068.0	42,474.4	188,246.3	370,231.1	510.0
523.8	42.6	52.7	82.3	90.6	129.3	131.0	528.5	1,052.3	1.4
-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
498.6	239.2	416.6	527.7	530.8	700.4	706.2	520.2	509.4	0.7
-0-	-0-	-0-	-0-	-0-	-0-	+7.6	+1.3	+0.6	+0.6
-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
498.6	239.2	416.6	527.7	530.8	700.4	713.8	521.5	510.0	0.7

Table 9  
ASSESSED VALUATIONS AND TAX RATES  
Fiscal Years 1945-46 to 1983-84

Fiscal Year	Secured Property	Public Utilities	Unsecured Property	Total	Tax Rate per \$100	
					Secured	Unsecured
1945-46	\$ 212,082,975	\$ 28,253,700	\$ 29,960,130	\$ 270,296,805	0.04	—
1946-47	208,715,150(1)	29,433,450	30,665,910	268,814,510	0.04	0.04
1947-48	233,579,990	32,740,680	40,977,850	307,298,520(2)	0.14	0.04
1948-49	254,227,570	37,482,020	47,177,300	338,886,890	0.14	0.14
1949-50	290,351,875	42,429,140	45,743,200	378,524,215	0.10	0.14
1950-51	306,104,930	43,595,730	44,717,740	394,418,400	0.10	0.10
1951-52	344,620,030	48,452,940	50,904,035	443,977,005	0.10	0.10
1952-53	382,948,860	53,208,220	63,996,330	500,153,410	0.12	0.10
1953-54	490,709,350	63,092,050	69,147,150	622,948,550	0.10	0.12
1954-55	546,272,880	69,243,550	79,629,790	695,146,220	0.10	0.10
1955-56	627,062,960	87,485,390	79,936,450	794,484,800	0.09	0.10
1956-57	680,824,400	101,224,260	97,950,800	879,999,460	0.09	0.09
1957-58	761,088,330	111,151,890	128,785,440	1,001,025,660	0.09	0.09
1958-59	865,283,080	128,479,290	128,124,720	1,121,887,090	0.10	0.09
1959-60	979,491,050	145,317,290	134,846,730	1,259,655,070	0.11	0.10
1960-61	1,116,723,830	165,666,720	159,954,740	1,442,345,290	0.11	0.11
1961-62	1,220,810,650	191,276,650	155,149,890	1,567,237,190	0.11	0.11
1962-63	1,272,506,330	201,245,370	154,989,440	1,628,741,140	0.11	0.11
1963-64	1,340,197,170	209,793,780	159,714,930	1,709,705,880	0.11	0.11
1964-65	1,423,375,590	213,352,470	151,686,520	1,788,414,580	0.11	0.11
1965-66	1,511,967,750	212,605,040	155,417,220	1,879,990,010	0.11	0.11
1966-67	1,567,290,460	212,223,550	147,740,730	1,927,254,740	0.11	0.11
1967-68	1,735,209,870	209,136,160	178,641,120	2,122,987,150	0.10	0.11
1968-69	1,876,936,060	208,018,700	197,139,600	2,282,094,360	0.09	0.10
1969-70	2,063,618,582	210,839,100	237,951,409	2,512,409,091	0.09	0.09
1970-71	2,348,151,943	216,378,300	276,932,717	2,841,462,960	0.09	0.09
1971-72	2,755,734,087	213,191,301	306,608,099	3,275,533,487	0.10	0.09
1972-73	3,061,010,163	225,224,650	347,857,938	3,634,092,751	0.11	0.10
1973-74	3,481,734,238	239,346,070	393,300,174	4,114,380,482	0.11	0.11
1974-75	4,075,823,685	249,562,970	450,374,627	4,775,761,282	0.11	0.11
1975-76	4,629,303,071	283,156,410	503,493,823	5,415,953,304	0.11	0.11
1976-77	5,230,851,497	311,553,680	545,425,038	6,087,830,215	0.11	0.11
1977-78	6,121,864,014	376,899,840	607,393,849	7,106,157,703	0.11	0.11
1978-79	6,272,490,327	554,099,470	707,294,537	7,533,884,334	0.06	0.11
1979-80	7,624,459,863	660,454,810	837,758,367	9,122,673,040	0.04	0.06
1980-81	9,163,752,692	731,869,180	483,834,623	10,379,456,495	0.05	0.04
1981-82(4)	41,759,646,912	3,457,486,860	1,692,548,096	46,889,681,868	0.01	0.0125
1982-83	46,670,563,147	4,136,558,170	1,971,803,569	52,778,924,886	0.00817	0.01
1983-84	50,057,533,413	5,275,693,400	2,190,834,774	57,524,061,587	0.004605	0.00817

- (1) City of Coronado secured assessed valuations 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) Gross Tax Levy; Includes State Grant for Business Inventory, Homeowners Exemption, and allocation of the 1% assessment from the County of San Diego.  
(4) Assessed valuation changed to full market value as determined by County Assessor.

Table 9  
Continued  
TAX LEVIES AND TAX COLLECTIONS BY FISCAL YEAR  
(Includes in Lieu of Taxes)  
Fiscal Years 1945-46 to 1983-84

Tax Levy(3)	Collection of Current Year's Taxes During Fiscal Year	Percentage of Levy Collected During Fiscal Year	Adjustments to Prior Year's Levies	Collection of Prior Years' Taxes During Fiscal Year	Total Tax Collections	Accumulated Delinquent Taxes	Ratio of Accumulated Delinquent Taxes to Tax Levy
\$ 96,131	\$ 94,656	98.47%	—	—	\$ 94,656	\$ 1,474	1.53%
107,808	105,753	98.09	—	1,090	106,844	2,439	2.26
389,591	381,563	97.94	—	1,882	383,445	8,585	2.20
474,520	459,504	96.84	—	5,916	465,420	17,685	3.73
401,112	392,732	97.91	329	13,342	406,074	13,052	3.25
397,970	390,274	98.07	373	8,217	398,492	12,904	3.24
450,405	441,242	97.97	978	7,699	448,941	15,346	3.40
594,603	585,417	98.46	(1,140)	12,567	597,985	10,824	1.82
652,335	640,239	98.15	4,213	9,942	650,181	17,191	2.62
709,678	695,200	97.96	1,295	12,638	707,838	20,326	2.86
803,375	788,734	97.41	(2,099)	12,140	800,874	20,726	2.59
874,774	861,461	98.48	576	13,056	874,517	21,560	2.46
965,006	946,445	98.08	958	12,890	959,335	28,189	2.92
1,178,885	1,157,265	98.17	—	13,347	1,170,613	36,462	3.09
1,436,270	1,408,277	98.05	(5,274)	16,647	1,424,925	42,533	2.97
1,624,733	1,586,169	97.63	(8,720)	21,501	1,607,671	50,874	3.15
1,763,785	1,718,575	97.44	(2,276)	31,477	1,750,053	62,330	3.54
1,816,449	1,775,932	97.77	(3,688)	38,134	1,814,066	61,023	3.37
1,910,019	1,862,973	97.54	(268)	36,825	1,899,799	70,975	3.72
2,000,067	1,948,853	97.44	(6,588)	42,596	1,991,450	73,003	3.66
2,101,023	2,033,032	96.76	2,503	44,784	2,077,816	98,714	4.69
2,154,994	2,090,637	97.01	(7,164)	54,333	2,144,970	101,573	4.73
2,175,276	2,129,996	97.92	(301)	64,473	2,194,470	82,078	3.77
2,110,913	2,103,601	99.65	—	55,253	2,158,854	34,136	1.62
2,182,274	2,149,330	98.49	91,680	24,018	2,204,127	103,963	4.52
2,450,123	2,408,899	98.32	38,500	104,032	2,512,932	79,655	3.25
3,084,869	3,058,713	99.15	27,045	32,926	3,091,639	99,930	3.24
3,790,191	3,743,715	98.77	494	45,314	3,789,029	101,586	2.68
4,004,024	3,941,152	98.43	4,891	43,846	3,984,999	125,502	3.13
4,673,400	4,597,610	98.37	(4,573)	42,611	4,640,222	154,107	3.32
5,336,375	5,223,483	97.88	(17,845)	76,632	5,300,115	172,522	3.23
6,012,954	5,928,085	98.59	34,543	109,718	6,037,803	182,216	3.03
7,111,999	7,083,080	99.59	(6,021)	87,193	7,170,273	117,921	1.66
5,956,033	5,802,438	97.42	—	134,444	5,936,882	137,027	2.30
5,549,222	5,420,190	97.67	(105,757)	137,072	5,557,262	23,275	0.42
7,164,231	7,076,598	97.78	181,346	137,782	7,214,380	154,472	2.16
7,150,025	6,886,178	96.31	73,743	228,215	7,114,393	213,847	3.69
6,690,619	6,634,619	99.16	197,022	164,354	6,798,973	302,515	4.52
6,588,403	6,460,324	98.06	(47,042)	178,479	6,638,803	205,073	3.11

Table 10  
**CHEMICAL CHARACTER OF NATURAL COLORADO RIVER WATER  
 AT WEST PORTAL OF SAN JACINTO TUNNEL**  
 Year Ending June 30, 1984  
 Samples Taken at Entrance to San Diego Aqueduct by M.W.D.  
 and Analyzed by District Laboratory

Month	Total Hardness as mg/l Ca CO <sub>3</sub>	Alkalinity as mg/l CaCO <sub>3</sub>		(PH) Hydrogen Ion Concentration	Temperature When Sampled	
		TOTAL	Magnesium as mg/l		°F	°C
July	335	130	30.5	8.40	77.0	25.0
August	331	123	30.0	8.33	80.6	27.0
September	327	123	29.0	8.46	81.5	27.5
October	324	130	29.0	8.31	70.7	21.5
November	322	131	29.0	8.28	68.0	20.0
December	320	135	27.5	8.34	57.2	14.0
January	320	133	27.5	8.23	52.7	11.5
February	320	136	27.5	8.33	55.4	13.0
March	318	134	27.5	8.38	58.1	14.5
April	320	134	28.0	8.43	65.3	18.5
May	318	135	27.0	8.34	66.2	19.0
June	316	135	27.0	8.42	73.4	23.0

ANALYSIS — YEAR ENDING JUNE 30, 1984  
 (mg/l except PH, Conductivity and Temperature)

Constituent	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO <sub>2</sub> )	8.4	10.1	7.0
Calcium	(Ca)	83	84	81
Magnesium	(Mg)	28.3	30.5	27.0
Sodium	(Na)	96	101	89
Potassium	(K)	4.1	4.6	3.8
Carbonate	(CO <sub>3</sub> )	1	2	-0-
Bicarbonate	(HCO <sub>3</sub> )	159	166	145
Sulfate	(SO <sub>4</sub> )	278	294	264
Chloride	(Cl)	81	90	73
Nitrate	(NO <sub>3</sub> )	0.95	1.25	0.40
Fluoride	(F)	0.33	0.38	0.30
Boron	(B)	0.12	0.14	0.09
Total Dissolved Solids		662	697	631
Hardness as CaCO <sub>3</sub> — Total		323	335	316
Alkalinity — Total		132	136	123
Free Carbon Dioxide	(CO <sub>2</sub> )	1.2	1.6	0.9
Hydrogen Ion Concentration	(PH)	8.35	8.46	8.23
Electrical Conductivity EC x 10 <sup>6</sup> @25°C		1036	1084	998
Temperature °C		19.5	27.5	11.5

Table 11  
**CHEMICAL CHARACTER OF BLENDED TREATED WATER  
 AT LAKE SKINNER**  
 Year Ending June 30, 1984  
 Samples Taken by M.W.D. and Analyzed by District Laboratory

Month	Total Hardness as mg/l Ca CO <sub>3</sub>	Alkalinity as mg/l CaCO <sub>3</sub>		(PH) Hydrogen Ion Concentration	Temperature When Sampled	
		TOTAL	Magnesium as mg/l		°F	°C
July	247	106	23.5	8.10	75.6	24.2
August	282	110	26.0	8.10	78.4	25.8
September	307	115	28.5	8.15	78.3	25.7
October	315	122	28.0	8.14	71.9	22.1
November	318	123	28.0	8.11	66.2	19.0
December	322	127	28.5	8.08	57.2	14.0
January	325	128	28.5	8.07	54.7	12.6
February	322	129	28.0	8.08	54.7	12.6
March	319	129	29.0	8.09	58.1	14.5
April	269	114	23.5	8.04	61.2	16.2
May	241	105	21.5	8.04	66.0	18.9
June	257	108	23.5	8.03	72.7	22.6

ANALYSIS — YEAR ENDING JUNE 30, 1984  
 (mg/l except PH, Conductivity and Temperature)

Constituent	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO <sub>2</sub> )	8.9	13.6	7.5
Calcium	(Ca)	74	83	60
Magnesium	(Mg)	26.4	29.0	21.5
Sodium	(Na)	91	100	75
Potassium	(K)	4.0	4.4	3.0
Carbonate	(CO <sub>3</sub> )	-0-	-0-	-0-
Bicarbonate	(HCO <sub>3</sub> )	144	157	128
Sulfate	(SO <sub>4</sub> )	254	283	203
Chloride	(Cl)	80	88	65
Nitrate	(NO <sub>3</sub> )	0.44	0.85	0.10
Fluoride	(F)	0.31	0.36	0.26
Boron	(B)	0.10	0.11	0.10
Total Dissolved Solids		611	666	501
Hardness as CaCO <sub>3</sub> — Total		294	325	241
Alkalinity — Total		118	129	105
Free Carbon Dioxide	(CO <sub>2</sub> )	2.0	2.2	1.7
Hydrogen Ion Concentration	(PH)	8.09	8.15	8.03
Electrical Conductivity EC x 10 <sup>6</sup> @25°C		970	1043	823
Temperature °C		19.0	25.8	12.6

Table 12  
ASSESSSED VALUATIONS AND TAX RATES OF THE  
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Fiscal Year	Area (acres)	Assessed Valuation 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	2,171,290	12,714,205,470	.17	.18
1960-61	2,544,960	13,737,971,925	.16	.17
1961-62	2,647,014	14,803,202,587	.15	.16
1962-63	2,797,946	15,699,681,030	.14	.15
1963-64	2,825,306	17,261,412,395	.14	.14
1964-65	2,882,144	17,757,246,740	.14	.14
1965-66	2,890,266	19,143,157,788	.14	.14
1966-67	2,901,421	20,979,150,165	.14	.14
1967-68	3,061,885	22,732,157,500	.14	.14
1968-69	3,067,896	24,016,568,274	.16	.14
1969-70	3,072,058	25,572,510,561	.17	.16
1970-71	3,075,616	27,605,064,302	.17	.17
1971-72	3,093,303	29,023,413,462	.17	.17
1972-73	3,126,803	31,001,520,641	.15	.17
1973-74	3,127,680	32,838,476,378	.14	.15
1974-75	3,129,664	35,941,961,265	.14	.14
1975-76	3,132,012	39,585,365,754	.13	.14
1976-77	3,132,800	45,695,542,697	.12	.13
1977-78	3,267,533	51,268,796,300	.12	.12
1978-79	3,268,337	53,573,470,118	.10	.12
1979-80	3,270,880	64,119,383,253	.09	.10
1980-81	3,272,679	69,390,300,019	.079	.09
1981-82	3,273,339	314,726,854,882(3)	.0198%(3)	.0198%(3)
1982-83	3,277,011	353,335,259,307	.0166%	.0198%
1983-84	3,280,294	379,788,761,242	0.237%	.0166%
1984-85	—	419,859,047,899	0.156%	.0237%

(1) Includes secured, unsecured, and public utility valuations.  
 (2) First year in which Authority assessed valuation was included in District's assessed valuation.  
 (3) Effective FY 1981-82, assessed valuation reported at 100% of full value, and tax rates levied in percentage of full assessed value.

Table 13  
METROPOLITAN WATER DISTRICT ANNEXATION CHARGES  
AND BALANCES ON AUTHORITY AREAS

Member Agencies	Date of Annexation	Amount of Annexation Charge	Remaining Balance 6-30-84
Annexation Charges Outstanding			
Bueno Colorado M.W.D.	6-11-54	\$ 1,072,230	\$ 35,038.20
Costa Real MWD (formerly Carlsbad MWD)	6-16-54	548,100	17,725.99
Del Mar, City of	11-23-62	611,250	183,138.53
De Luz M.W.D.	6-28-67	2,002,000	*3,145,430.38
No. 1 Annexation of 1969	10-15-69	312,000	*510,757.00
Fallbrook P.U.D.			
No. 2 Annexation of 1958	11-24-58	50,400	8,328.25
Fallbrook Community Air Park	12-22-69	59,800	*87,387.33
Helix Water District			
El Cajon Dry Island Annexation	12-20-54	327,450	13,289.34
Helix-Watson Ranch Annexation	2-20-59	8,730	2,029.98
Helix-Sunny Slope Hts. Annexation	9-17-59	38,250	7,645.87
Olivenhain M.W.D.	7-25-60	83,880	19,602.29
No. 1 Annexation of 1965	2-11-65	512,520	204,992.52
No. 4 Annexation of 1967	11-13-67	74,000	73,820.58
Otay W.D.	10-26-56	273,000	18,745.14
No. 3 Annexation of 1960	10-20-60	95,100	22,152.28
Padre Dam M.W.D. (not including Lakeside I.D.) (Formerly Rio San Diego M.W.D.)	6-7-56	373,980	36,381.72
No. 2 Annexation of 1959	11-6-59	109,110	21,751.60
No. 3 Annexation of 1960	10-17-60	289,890	67,379.68
No. 4 Annexation of 1970	8-3-70	164,000	132,534.21
Poway M.W.D.	4-21-54	91,800	3,585.43
No. 1 Annexation of 1959	9-21-59	27,150	5,341.42
Rainbow M.W.D.	4-10-54	167,700	5,944.44
No. 1 Annexation of 1959	5-12-59	24,300	4,840.18
No. 3 Annexation of 1967	12-6-67	1,728,000	*2,961,388.24
No. 5 Annexation of 1973	11-22-73	13,200	12,056.91
Ramona M.W.D.	8-27-57	339,000	45,039.25
No. 1 Annexation of 1959	5-29-59	42,330	8,427.55
No. 2 Annexation of 1961	9-22-61	15,480	4,115.48
No. 3 Annexation of 1963	9-20-63	10,560	3,516.91
No. 4 Annexation of 1967	11-27-67	480,600	601,471.41
No. 5 Annexation of 1972	5-17-72	732,000	*784,796.34
Rincon del Diablo M.W.D.	6-14-54	757,200	24,230.18
No. 4 Annexation of 1972	11-2-72	19,200	24,378.57
San Dieguito Water District			
No. 1 Annexation of 1959	9-15-59	71,820	14,246.19
No. 2 Annexation of 1972	12-8-72	107,000	*139,631.25
Valley Center M.W.D.	5-9-55	205,680	13,313.72
No. 1 Annexation of 1960	12-12-60	23,700	5,519.37
No. 2 Annexation of 1967	11-29-67	22,000	29,293.34
No. 3 Annexation of 1967	11-30-67	502,000	*669,312.80
Yuima M.W.D.	12-16-63	749,490	249,757.46
No. 1 Annexation of 1967	11-21-67	72,200	61,200.15
No. 2 Annexation of 1969	11-24-69	14,400	15,206.48
Pendleton Mil. Reservation-Nuclear Generating Plant	12-16-77	**2,405,229	**2,153,706.44
Total		\$16,077,099	\$12,448,450.40

Annexation charges received from other annexed areas not listed above having no remaining balance . . . . . \$15,549,571

\*Annual interest charge on outstanding balance is greater than tax levy based on maximum MWD tax rate of .1875% of assessed valuation (formerly 75¢/\$100 of A.V.)

\*\*Principal only.

Table 14  
WATER SALES BY METROPOLITAN WATER DISTRICT

Fiscal Years 1941-42 to 1983-84

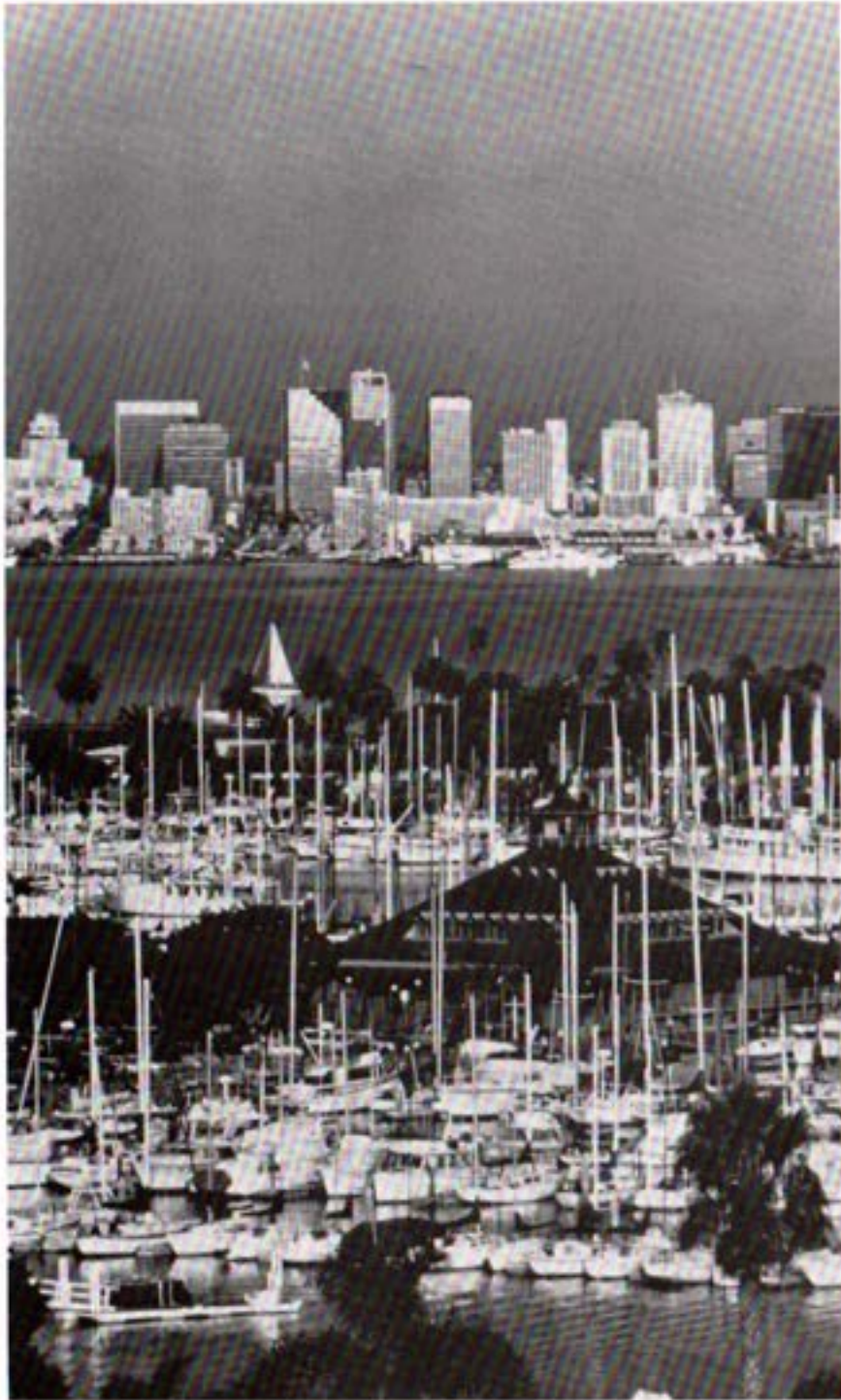
Year	To Member Municipalities				Total to Agencies	To Others	Total
	Natural Water		Treated Water				
	Acre Feet	Percent	Acre Feet	Percent			
1941-42	-0-	-0-	9,372.6	100	9,372.6	70.7	9,443.3
1942-43	-0-	-0-	14,457.8	100	14,457.8	2,626.4	17,084.2
1943-44	-0-	-0-	15,874.9	100	15,874.9	3,301.8	19,176.7
1944-45	-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	463,935.1	75,612.8	539,536.9
1958-59	244,354.2	46	282,248.1	54	526,602.3	74,107.1	600,709.4
1959-60	425,019.0	58	304,874.8	42	729,893.8	3,523.2	733,417.0
1960-61	594,521.1	64	335,207.2	36	929,728.3	4,099.4	933,827.7
1961-62	608,811.0	66	312,975.9	34	921,786.9	3,676.9	925,463.8
1962-63	668,881.8	66	348,092.6	34	1,016,974.4	3,677.0	1,020,651.4
1963-64	671,853.4	63	388,553.9	37	1,060,407.3	3,776.7	1,064,184.0
1964-65	645,577.3	58	471,042.0	42	1,116,619.3	5,035.3	1,121,654.6
1965-66	550,630.8	52	503,424.9	48	1,054,055.7	4,821.8	1,058,877.5
1966-67	523,141.2	50	531,659.7	50	1,054,800.9	4,513.0	1,059,313.9
1967-68	514,248.1	48	557,730.9	52	1,071,979.0	4,934.9	1,076,913.9
1968-69	455,174.3	43	599,237.7	57	1,054,412.0	2,232.4	1,056,644.4
1969-70	482,256.9	41	692,846.4	59	1,165,103.3	650.0	1,165,753.3
1970-71	520,983.9	46	612,511.6	54	1,133,495.5	150.3	1,133,645.8
1971-72	590,356.9	47	656,635.9	53	1,246,992.8	549.6	1,247,542.4
1972-73	569,290.7	48	606,120.4	52	1,175,411.1	4.3	1,175,415.4
1973-74*	655,058.0	52	593,180.0	48	1,248,238.0	955.0	1,249,193.0
1974-75*	721,970.0	54	607,013.0	46	1,328,983.0	653.0	1,329,636.0
1975-76*	735,100.0	53	653,154.0	47	1,388,254.0	994.0	1,389,248.0
1976-77*	560,124.0	40	829,773.0	60	1,389,897.0	569.0	1,390,466.0
1977-78*	508,036.0	40	757,270.0	60	1,265,306.0	22,019.0	1,287,325.0
1978-79*	434,455.0	35	777,173.0	65	1,211,628.0	24,256.0	1,235,884.0
1979-80	438,414.0	34	843,800.0	66	1,282,214.0	2,620.0	1,284,834.0
1980-81	487,833.0	33	975,177.0	67	1,463,010.0	588.0	1,463,598.0
1981-82	562,650.0	37	940,660.0	63	1,503,310.0	989.0	1,504,299.0
1982-83	314,190.0	26	912,172.0	74	1,226,362.0	207.0	1,226,569.0
1983-84	364,608.5	26	1,062,123.5	74	1,426,732.0	1,210.0	1,427,942.0

\*Revised

Table 15  
WATER PRODUCTION — METROPOLITAN WATER DISTRICT CONSTITUENT AREAS  
Figures Furnished by Metropolitan Water District

	Total Water Production				Source of Water Produced — 1983-1984			
	(1)	(2)	(3)	(4)	(3 + 2)	(4 + 2)	Percent of Total	Percent of Total
	1982-83 Amount Ac. Ft.(b)	1983-84 Amount Ac. Ft.(b)	MWD Direct Deliveries Ac. Ft.(b)	Local Production Amount Ac. Ft.	Percent Increase or Decrease	Percent of Total		
Anaheim.....	61,025	65,830	35,943	29,887	55	45		
Beverly Hills.....	13,218	14,654	14,654	0	100	0		
Burbank.....	20,929	23,603	23,304	299	99	1		
Calleguas M. W. D.....	87,573	109,926	81,375	28,551	74	26		
Central Basin M. W. D.....	233,561	260,245	90,422	169,823	35	65		
Chino Basin M. W. D.....	152,216	175,769	26,362	149,407	15	85		
Coastal M. W. D.....	35,949	40,807	40,364	443	99	1		
Compton.....	9,059	9,730	3,824	5,906	39	61		
Eastern M. W. D.....	110,540	124,558	28,657	95,901	23	77		
Foothill M. W. D.....	13,758	15,985	9,733	6,252	61	39		
Fullerton.....	29,729	33,276	24,870	8,406	75	25		
Glendale.....	26,185	29,138	24,450	4,688	84	16		
Las Virgenes M. W. D.....	13,462	12,666	12,666	0	100	0		
Long Beach.....	69,255	74,701	52,319	22,382	70	30		
Los Angeles.....	594,544	651,295	29,102	622,193	4	96		
Orange County M. W. D.....	335,491	380,786	201,686	179,100	53	47		
Pasadena.....	33,901	37,860	15,861	21,999	42	58		
San Diego C. W. A.....	447,536	541,179	367,247	173,932	68	32		
San Fernando.....	3,225	3,737	0	3,737	0	100		
San Marino.....	4,172	5,051	18	5,033	0	100		
Santa Ana.....	41,875	46,832	15,762	31,070	34	66		
Santa Monica.....	18,582	18,601	10,801	7,800	58	42		
Three Valleys M. W. D.....	107,317	108,132	51,688	56,444	48	52		
Torrance.....	27,849	29,668	19,162	10,506	65	35		
Upper San Gabriel Valley M. W. D.....	152,872	175,361	23,105	152,256	13	87		
West Basin M. W. D.....	173,753	187,628	182,833	4,795	97	3		
Western M. W. D.....	206,934	204,144	142,620	163,620	20	80		
Totals.....	3,024,690	3,381,162	1,426,732	1,954,430	42	58		

NOTES: (a) Includes seepage into San Jacinto Tunnel.  
(b) Does not include water delivered for groundwater replenishment.



San Diego County Water Authority  
ANNUAL FINANCIAL REPORT  
YEAR ENDED JUNE 30, 1984



Peat, Marwick, Mitchell & Co.  
Certified Public Accountants  
225 Broadway, Suite 1400  
San Diego, California 92101

The Board of Directors  
San Diego County Water Authority:

We have examined the balance sheets of the San Diego County Water Authority as of June 30, 1984 and 1983, and the related statements of earnings, changes in equity, and changes in financial position for the years then ended. Our examinations were 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 aforementioned financial statements present fairly the financial position of the San Diego County Water Authority at June 30, 1984 and 1983 and the results of its operations and the changes in its financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis after restatement for the change, with which we concur, in the method of accounting for participation rights as described in note 2 to the financial statements.

Our examinations were made for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplementary information included in Schedule 1 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the examinations of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

*Peat, Marwick, Mitchell & Co.*

August 3, 1984, except as  
to note 7 which is as of  
August 29, 1984

## SAN DIEGO COUNTY WATER AUTHORITY

## Balance Sheets

June 30, 1984 and 1983

	1984	1983
<b>Assets</b>		
<b>Current assets:</b>		
Cash and certificates of deposit	\$ 17,226,499	\$ 8,279,070
Accounts and taxes receivable, net of allowance for delinquent taxes of \$52,874 in 1984 and \$32,871 in 1983	9,327,613	3,938,378
Inventory of water in storage	1,613,327	1,425,564
Prepaid expenses	41,653	43,708
<b>Total current assets</b>	<u>28,189,132</u>	<u>13,686,720</u>
<b>Restricted assets:</b>		
Debt redemptions:		
Waterworks bonds:		
Cash and certificates of deposit	1,764,079	1,757,657
Taxes and interest receivable, less allowance for delinquent taxes of \$247,283 in 1984 and \$321,488 in 1983	61,555	62,239
U.S. Government contracts:		
Cash and certificates of deposit	232,610	130,746
Due from Metropolitan Water District	2,121,490	2,318,838
Taxes and interest receivable, less allowance for delinquent taxes of \$9,228 in 1984 and \$14,473 in 1983	1,762	3,588
Capital improvements:		
Cash and certificates of deposit	3,628,291	4,844,996
Unamortized issue costs	165,473	198,710
Investment in annuity contract	355,875	283,215
<b>Total restricted assets</b>	<u>6,089,666</u>	<u>11,599,879</u>
<b>Property, plant, and equipment, net (note 3)</b>	<u>125,794,871</u>	<u>123,154,145</u>
	<u>\$ 162,073,687</u>	<u>\$ 148,280,724</u>
<b>Liabilities and Equity</b>		
<b>Current liabilities, payable from current assets:</b>		
Accounts payable	\$ 18,860,098	\$ 7,461,716
Advances and deposits by agencies	241,042	60,384
Accrued expenses	361,932	323,363
<b>Total current liabilities, payable from current assets</b>	<u>19,463,072</u>	<u>8,049,463</u>
<b>Current liabilities, payable from restricted assets:</b>		
Current installments of long-term debt (note 4)	4,699,373	3,589,373
Accrued interest payable	818,013	859,632
<b>Total current liabilities</b>	<u>25,760,460</u>	<u>12,288,655</u>
<b>Deferred compensation payable</b>	<u>334,974</u>	<u>283,312</u>
<b>Long-term debt, excluding current installments (note 4):</b>		
General obligation waterworks bonds	37,285,000	39,417,000
U.S. Government contract	3,403,360	3,872,893
Note payable to bank	8,000,000	8,000,000
Contract notes payable	4,000,000	4,000,000
<b>Total long-term debt</b>	<u>52,688,360</u>	<u>52,087,023</u>
<b>Equity:</b>		
Equity in property, plant and equipment (note 3)	58,209,936	61,876,633
Restricted balances:		
Waterworks bonds, debt redemption	1,103,436	1,265,914
U.S. Government contract, debt redemption	2,332,362	2,437,172
Capital improvements	3,477,899	6,947,861
Appropriated, long-term projects	7,404,793	7,226,039
Unrestricted balance	1,351,267	2,633,216
<b>Total equity</b>	<u>84,069,693</u>	<u>79,605,619</u>
	<u>\$ 162,073,687</u>	<u>\$ 148,280,724</u>

See accompanying notes to financial statements.

## SAN DIEGO COUNTY WATER AUTHORITY

## Statements of Earnings

Years ended June 30, 1984 and 1983

	1984	1983
Water sales (note 6)	\$ 67,058,369	\$ 38,289,383
Cost of water sold (note 6)	<u>63,322,563</u>	<u>35,627,652</u>
<b>Gross margin from water sales</b>	<u>3,735,806</u>	<u>2,661,731</u>
<b>Operating expenses:</b>		
Water treatment	90,507	109,791
Systems operations	219,299	210,157
Maintenance of structures and plant	357,844	299,034
Automotive operation, maintenance, and shop expense	127,660	131,806
Depreciation	1,523,546	1,090,705
Administrative and general salaries	343,570	355,502
General expense and supplies	<u>1,141,493</u>	<u>901,560</u>
<b>Total operating expenses</b>	<u>3,803,919</u>	<u>3,098,555</u>
<b>Net loss from operations</b>	68,113	436,824
<b>Nonoperating income (expense):</b>		
Property taxes	6,811,121	6,852,252
Interest expense, net of interest capitalized of \$65,000 in 1984 and \$1,996,000 in 1983	(3,031,174)	(1,198,608)
Interest income	1,961,079	2,266,386
Other	<u>(198,061)</u>	<u>(60,780)</u>
<b>Net earnings</b>	<u>\$ 5,474,852</u>	<u>\$ 7,422,426</u>

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY

Statements of Changes in Equity

Years ended June 30, 1984 and 1983

	Total equity	Unrestricted balance	Appropriated long-term projects	U.S. Government contract	Restricted balances		Equity in property, plant, and equipment
					Waterworks bonds	Debt redemption	
Balance, July 1, 1982	\$ 226,206,985	9,955,668	2,556,489	2,520,928	1,077,725	4,855,941	50,001,769
Additions (deductions):							
Net earnings (loss)	7,422,426	2,827,092	-	321,819	3,090,262	2,308,158	(1,090,705)
Capital expenditures for property, plant, and equipment:					(747,071)	(1,248,919)	1,996,000
From restricted assets	-	(8,465,321)	-	-	-	-	8,465,321
From operations	114,673	-	-	-	(2,120,000)	-	(114,673)
Waterworks bonds redeemed	-	-	-	(369,575)	-	-	2,120,000
Payments on U.S. Government contracts	-	(101,821)	(220,650)	-	-	932,451	389,575
Transfers, net	-	-	-	-	-	-	-
Balance, June 30, 1983	28,600,819	3,611,216	2,326,039	2,473,122	1,265,916	6,967,861	51,826,635
Additions (deductions):							
Net earnings (loss)	5,434,852	5,031,405	-	231,765	2,257,520	(922,292)	(1,523,546)
Capital expenditures for property, plant, and equipment:							
From restricted assets	-	(4,105,250)	-	-	-	-	4,105,250
From operations	-	-	-	-	-	-	65,000
From contributions by member agencies	(5,978)	-	-	-	-	-	(5,978)
Waterworks bonds redeemed	-	-	-	(369,575)	(2,220,000)	-	2,220,000
Payments on U.S. Government contracts	-	-	-	-	-	-	369,575
Payment on note to bank	-	-	-	-	-	(1,000,000)	1,000,000
Transfers, net	-	(3,196,104)	5,078,734	-	-	(1,882,650)	-
Balance, June 30, 1984	\$ 85,069,682	1,661,967	7,406,793	2,335,362	1,303,426	3,477,899	48,206,926

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY  
 Statements of Changes in Financial Position  
 Years ended June 30, 1984 and 1983

	1984	1983
Sources of working capital:		
Net earnings	\$ 5,474,852	7,422,426
Add depreciation which does not use working capital	1,523,546	1,090,705
Working capital provided by operations:	6,998,398	8,513,131
Contributions by member agencies for property, plant, and equipment, net of interest on deposits	(5,978)	114,673
Decrease in:		
U.S. Government contract equity	137,810	47,756
Capital improvements equity	3,469,942	-
Working capital	-	6,575,102
	\$ 10,600,172	15,250,662
Uses of working capital:		
Repayments of long-term debt excluding annexation charges	3,589,575	2,489,575
Capital expenditures	4,164,272	10,575,996
Increase in:		
Waterworks bonds equity	37,520	193,191
Capital improvements equity	-	1,991,900
Working capital	2,808,805	-
	\$ 10,600,172	15,250,662
Changes in components of working capital:		
Increase (decrease) in current assets:		
Cash and certificates of deposit	8,847,429	(7,353,560)
Accounts and taxes receivable, net	5,369,235	(723,484)
Inventory of water in storage	(12,017)	259,080
Prepaid expenses	(2,215)	(4,545)
	14,202,432	(7,822,509)
Increase (decrease) in current liabilities, payable from current assets:		
Accounts payable	11,198,382	(1,227,317)
Advances and deposits by agencies	180,658	(121,899)
Accrued expenses	14,587	101,809
	11,393,627	(1,247,407)
Increase (decrease) in working capital	\$ 2,808,805	(6,575,102)

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

June 30, 1984 and 1983

(1) Summary of Significant Accounting Policies

Accounting Methods:

The Authority operates and reports as an enterprise utilizing the accrual method of accounting.

Taxes Receivable:

Uncollected taxes receivable are recorded at the amount billed and an allowance is established for the amount estimated uncollectible within the ensuing year.

Inventories of Water in Storage:

Inventories of water in storage are stated at cost using the first-in, first-out method.

Property, Plant, and Equipment:

Property, plant, and equipment are recorded at cost. Depreciation of property, plant, and equipment is computed on the straight-line method over the estimated lives of the respective assets.

(2) Change in Accounting Principle

In the past the Authority has shown an item, "Participation Rights," as an asset with corresponding credits to "Annexation Charges - Metropolitan Water District" included in long-term debt and "Contributed Capital," included in equity. These items represented the right to purchase water from the Metropolitan Water District of Southern California (MWD), and the cumulative amount of taxes levied and collected on properties within the Authority and direct payments by member agencies of MWD.

During 1984 a study indicated that other member agencies of MWD did not follow that practice in their financial statements. Since a change in this reporting procedure does not affect either the rights or obligations of the Authority, it was decided to remove this intangible asset from the financial statements to conform to the practice generally followed by other members of the MWD.

The change better reflects the equity of the Authority, and does not affect its operations or its ability to meet its financial obligations.

Historically, the Authority has purchased from MWD all water imported needed to meet the demands of its member agencies. It expects to be able to continue to do so in the future.

(Continued)

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements, Continued

(3) Property, Plant, and Equipment, and Equity Therein

	1984	1983
Property, plant, and equipment:		
Property, plant, and equipment	\$ 139,311,654	107,148,320
Construction work in progress	<u>7,141,320</u>	<u>35,141,386</u>
	146,452,974	142,289,706
Less accumulated depreciation	<u>20,658,103</u>	<u>19,135,561</u>
Net property, plant, and equipment	125,794,871	123,154,145
Less total long-term debt including current installments	<u>57,587,935</u>	<u>61,177,510</u>
Equity in property, plant, and equipment	<u>\$ 68,206,936</u>	<u>61,976,635</u>

(4) Long-Term Debt

	Interest rate	1984	1983
General obligation bonds:			
Waterworks bonds, 1957, maturing February 1, 1985-1994	1% - 6%	\$ 17,260,000	18,800,000
Waterworks bonds, 1966, maturing October 1, 1984-2004	4.5% - 5.5%	<u>22,355,000</u>	<u>23,035,000</u>
Total bonds		<u>39,615,000</u>	<u>41,835,000</u>
U.S. Government contracts due February, 1995:			
Authority's share; second pipeline	2.6%	1,851,445	2,023,672
Metropolitan Water District's share; second pipeline	2.6%	<u>2,121,490</u>	<u>2,318,838</u>
Total U.S. Government contracts		<u>3,972,935</u>	<u>4,342,510</u>
Note payable to bank, maturing June 25, 1985-1988	7.1%	8,000,000	9,000,000
Contract notes payable, maturing May 1, 1988-1990	9.25% - 10%	<u>6,000,000</u>	<u>6,000,000</u>
Total long-term debt		57,587,935	61,177,510
Less current installments of long-term debt		<u>4,699,575</u>	<u>3,589,575</u>
Long-term debt, excluding current installments		<u>\$ 52,888,360</u>	<u>57,587,935</u>

(Continued)

SAN DIEGO COUNTY WATER AUTHORITY

3

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements, Continued

(4) Long-Term Debt, Continued

The Metropolitan Water District's share of U.S. Government contracts, \$2,121,490 and \$2,318,838 at June 30, 1984 and 1983, respectively, are also recorded as due from Metropolitan Water District.

Maturities of long-term debt are summarized as follows:

1985	\$ 4,699,575
1986	4,794,575
1987	4,884,575
1988	5,999,575
1989	6,099,575
1990-1994	17,232,875
1995-1999	6,332,185
2000-2004	<u>7,545,000</u>
	<u>\$ 57,587,935</u>

The Authority uses the services of paying agents to handle payment of long-term debt maturities and interest expense. The agents held \$383,208 and \$796,547 at June 30, 1984 and 1983, respectively, for the payment of matured unredeemed principal and interest on bonded debt. The amounts held by the paying agent have not been included in the financial statements.

The Authority has a \$5,000,000 unused line of credit with its primary bank. If used, the borrowings would be secured by certificates of deposit held by the bank. The Authority uses this line of credit for short time periods to help coordinate the transfer of funds for monthly MWD billing payments. The line of credit bears an interest rate 1% higher than the highest rate paid the Authority on pledged certificates of deposit.

(5) Pension Plan

The Authority is a member of the California Public Employees' Retirement System which provides retirement benefits for all of its permanent employees. The total pension cost was \$237,646 in 1984 and \$192,665 in 1983, which included amortization of prior service costs. The Authority's contribution rate was 17.65% of annual payroll in 1984 and 14.04% in 1983.

In addition, beginning in 1984, the Authority paid one-half of certain employee's required contribution. In 1984, this additional pension cost amounted to \$28,720.

(Continued)

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SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements, Continued

(6) Water Sales and Cost of Water Sold

Total water sales and cost of water sold has increased largely due to the increase in water rates charged the Authority by MWD which the Authority passes on to its member agencies. A summary of the rate differences from June 30, 1983 to 1984 follows:

	Rate MWD charges the Authority	Authority surcharge	Rate the Authority charges its member agencies
Treated water rate per acre foot at June 30, 1984	\$ 225.00	17.00	242.00
Treated water rate per acre foot at June 30, 1983	<u>140.00</u>	<u>15.50</u>	<u>155.50</u>
Dollar increase in rate	\$ <u>85.00</u>	<u>1.50</u>	<u>86.50</u>
Percentage increase in rate	<u>60.7%</u>	<u>9.7%</u>	<u>55.6%</u>
Untreated water rate per acre foot at June 30, 1984	197.00	10.00	207.00
Untreated water rate per acre foot at June 30, 1983	<u>114.00</u>	<u>10.00</u>	<u>124.00</u>
Dollar increase in rate	\$ <u>83.00</u>	-	<u>83.00</u>
Percentage increase in rate	<u>72.8%</u>	-	<u>66.9%</u>

To a lesser extent, an increase in the quantity of water purchased and sold by the Authority from 1983 to 1984 accounts for a portion of the increase in total water sales and cost of water sold.

(7) Subsequent Event

In August 1984, the Authority entered into an option agreement to purchase water from a private company. The agreement is subject to regulatory approvals and other performance requirements on the part of both parties prior to being enforceable. The rights and obligation to purchase water can be assigned to a third party by the Authority. The agreement, if finalized, provides for the Authority to purchase a minimum of 300,000 acre feet of water per year up to a maximum of 500,000 acre feet. The purchase price will be 90% of the amount charged by MWD per acre foot of water, as periodically adjusted. The agreement to purchase expires 40 years from the date of inception.

(Continued)

## SAN DIEGO COUNTY WATER AUTHORITY

Schedule 1

## SAN DIEGO COUNTY WATER AUTHORITY

## Bonded Debt Maturities

June 30, 1984

Year ended June 30	Waterworks Bonds		Total principal	Total interest	Total payments
	1957 principal	1966 principal			
1985	\$ 1,620,000	710,000	2,330,000	1,678,707	4,008,707
1986	1,680,000	745,000	2,425,000	1,584,486	4,009,486
1987	1,740,000	775,000	2,515,000	1,486,521	4,001,521
1988	1,815,000	815,000	2,630,000	1,384,475	4,014,475
1989	1,880,000	850,000	2,730,000	1,277,868	4,007,868
1990	1,960,000	890,000	2,850,000	1,166,815	4,016,815
1991	2,040,000	925,000	2,965,000	1,051,020	4,016,020
1992	2,100,000	970,000	3,070,000	930,117	4,000,117
1993	2,165,000	1,015,000	3,180,000	804,537	3,984,537
1994	260,000	1,060,000	1,320,000	694,630	2,014,630
1995	-	1,105,000	1,105,000	632,747	1,737,747
1996	-	1,155,000	1,155,000	577,377	1,732,377
1997	-	1,210,000	1,210,000	519,435	1,729,435
1998	-	1,265,000	1,265,000	458,797	1,723,797
1999	-	1,320,000	1,320,000	395,465	1,715,465
2000	-	1,380,000	1,380,000	329,315	1,709,315
2001	-	1,440,000	1,440,000	260,225	1,700,225
2002	-	1,505,000	1,505,000	188,072	1,693,072
2003	-	1,575,000	1,575,000	112,612	1,687,612
2004	-	1,645,000	1,645,000	37,012	1,682,012
	\$ <u>17,260,000</u>	<u>22,355,000</u>	<u>39,615,000</u>	<u>15,570,233</u>	<u>55,185,233</u>