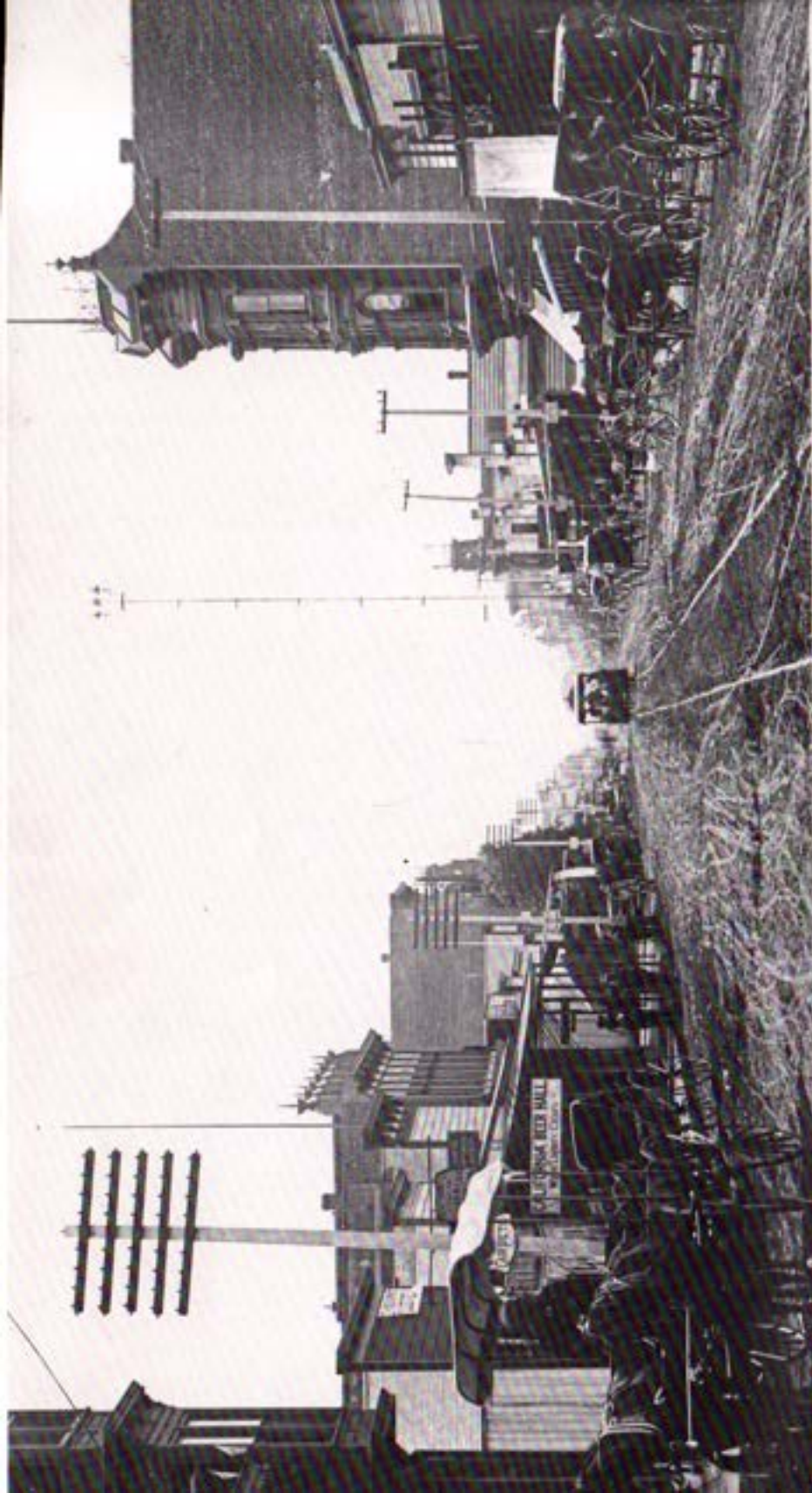


**SAN DIEGO
COUNTY WATER AUTHORITY**



FORTIETH ANNUAL REPORT

1986



San Diego's Fifth Street in 1888.

San Diego Historical Society - Tabor Collection

SAN DIEGO COUNTY WATER AUTHORITY

Organized June 9, 1944

FORTIETH ANNUAL REPORT

of Authority Operations
for Fiscal Year Ending June 30, 1986

Lawrence R. Michaels
General Manager and Chief Engineer

SAN DIEGO, CALIFORNIA
1986

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SAN DIEGO COUNTY WATER AUTHORITY

*Member Agencies, Date of Entry and
Representative on Board of Directors on June 30, 1986*

CITIES

Del Mar	Nov. 23, 1962
James A. Ferrara	
Escondido	Oct. 9, 1950
George M. Lohnes, Jr.	
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, Lawrence Hirsch, Francesca M. Krauel, John M. Leach, Michael D. Madigan, Joseph Parker, Paul A. Peterson, Philip R. Pryde, John P. Starkey	

WATER DISTRICTS

Helix	June 9, 1944
Nat L. Eggert, Harry Griffen	
Otay	Oct. 26, 1956
Mark W. Watton	
San Dieguito	Dec. 13, 1948
Laena Dashiell	

IRRIGATION DISTRICTS

Santa Fe	Dec. 13, 1948
John M. Cranston	
South Bay	Nov. 3, 1952
Richard G. Zogob	
<i>(Includes City of Chula Vista, an independent member agency, from June 9, 1944 to November 3, 1952)</i>	

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
Phil Berg	
Olivenhain	July 25, 1960
William Hollingsworth	
Padre Dam	June 7, 1956
W. E. Klostermann	
<i>(Includes Lakeside I.D., an independent member agency, from June 9, 1944 to June 7, 1956)</i>	
Rainbow	April 10, 1954
Herbert H. Stickney	
Ramona	August 27, 1957
Ward Oden	
Rincon del Diablo	June 14, 1954
Sherwood A. Anderson	
Valley Center	May 9, 1955
John F. Hennigar	
Yuima	Dec. 16, 1963
Linden R. Buzzell	

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	

COUNTY OF SAN DIEGO

Susan Golding	Feb. 13, 1986
---------------	---------------

OFFICERS OF BOARD OF DIRECTORS

1985-86



Chairman
NAT L. EGGERT
Helix Water District
10-77 to 6-86



Vice Chairman
FRANCESCA M. KRAUEL
San Diego
8-78 to 6-86



Secretary
DALE MASON
San Marcos County Water District
3-80 to 6-86



LAWRENCE R. MICHAELS
*General Manager and
Chief Engineer*



PAUL D. ENGSTRAND
General Counsel



JANET RAVIART
Executive Secretary

BOARD OF DIRECTORS

1985-86

For Officers, see page 5



S. D. ANDERSON
*Rincon Del Diablo
Municipal Water District
8-78 to 6-86*



CRAIG S. ANDREWS
*San Diego
5-83 to 6-86*



ALAN D. ARCHIBALD
*City of Poway
10-82 to 6-86*



PHIL BERG
*De Luz Heights
Municipal Water District
3-86 to 6-86*



LINDEN R. BURZELL
*Yuima Municipal
Water District
2-86 to 6-86*



PAUL L. V. CAMPO
*Pendleton Military
Reservation
1-78 to 6-86*



DR. CHARLES F. COOPER
*San Diego
4-73 to 6-86*



JOHN M. CRANSTON
*Santa Fe
Irrigation District
10-64 to 6-86*



TOM CROWNOVER
*National City
6-76 to 6-86*

BOARD OF DIRECTORS

1985-86

(Continued)



LAENA DASHIELL
*San Dieguito
Water District
1-78 to 6-86*



ROBERT M. DODD
*Escondido
1-70 to 6-86*



HANS H. DOE
*Buena Colorado
Municipal Water District
6-54 to 6-86*



JANET ERICKSON
*San Diego
2-74 to 5-86*



JAMES A. FERRARA
*City of Del Mar
9-83 to 6-86*



F. D. FITZSIMMONS
*Yuima Municipal
Water District
8-71 to 2-86*



SUSAN GOLDING
*County of San Diego
2-86 to 6-86*



HOWARD G. GOLEM
*Olivenhain Municipal
Water District
1-62 to 5-86*



HARRY GRIFFEN
*Helix
Water District
7-56 to 6-86*

BOARD OF DIRECTORS

1985-86

(Continued)



JOHN F. HENNIGAR
*Valley Center
Municipal Water District*
10-76 to 6-86



LAWRENCE HIRSCH
San Diego
5-73 to 6-86



WILLIAM HOLLINGSWORTH
Olivenhain MWD
5-86 to 6-86



W. E. KLOSTERMANN
*Padre Dam Municipal
Water District*
2-83 to 6-86



JOHN M. LEACH
City of San Diego
5-86 to 6-86



ROY W. LESSARD
San Diego
5-73 to 9-85



GEORGE M. LOHNES, JR.
City of Escondido
6-86 to 6-86



MICHAEL D. MADIGAN
San Diego
5-79 to 6-86



FRED W. MAERKLE
*Costa Real Municipal
Water District*
11-78 to 6-86

BOARD OF DIRECTORS

1985-86

(Continued)



WARD ODEN
*Ramona Municipal
Water District*
4-86 to 6-86



JOSEPH PARKER
City of San Diego
3-77 to 6-83
5-86 to 6-86



PAUL A. PETERSON
San Diego
6-83 to 6-86



PHILIP R. PRYDE
City of San Diego
9-85 to 6-86



FRED H. REESE
*Ramona Municipal
Water District*
1-85 to 4-86



DAVID RORICK, JR.
Oceanside
8-73 to 6-86



JOHN P. STARKEY
San Diego
10-75 to 6-86



HERBERT H. STICKNEY
*Rainbow Municipal
Water District*
3-85 to 6-86



DR. ALICE C. TANG
San Diego
10-79 to 5-86

BOARD OF DIRECTORS

1985-86

(Continued)



GORDON W. TINKER
*Fallbrook Public
Utility District*
4-83 to 6-86



MARK W. WATTON
Otay Water District
2-85 to 6-86



GEORGE F. YACKEY
*De Luz Heights
Municipal Water District*
6-68 to 3-86



RICHARD G. ZOGOB
South Bay Irrigation District
7-85 to 6-86



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



JOHN M. CRANSTON
12-74 to 6-86



HANS H. DOE
7-59 to 6-86



HARRY GRIFFEN
1-63 to 6-86



FRANCESCA M. KRAUEL
10-83 to 6-86



MICHAEL D. MADIGAN
7-82 to 6-86



JOHN P. STARKEY
1-81 to 6-86

ADMINISTRATIVE STAFF



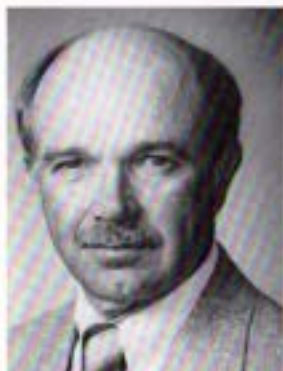
ARTHUR R. BULLOCK
Assistant General Manager



ROBERT E. MELBOURNE
Assistant Chief Engineer



HENRY LOZANO
*Director of Finance
and Treasurer*



LARRY HOBSON
Project Construction Engineer



I. E. NICHOLS
Superintendent



PETE RIOS
*Director of
Public Information*

**SAN DIEGO COUNTY WATER AUTHORITY
ROSTER OF STANDING COMMITTEES
AS OF JUNE 30, 1986**

ADMINISTRATIVE POLICY

Laena Dashiell, Chairman
Francesca M. Krauel, Liaison
Linden R. Burzell
Paul L. V. Campo
Robert M. Dodd
William Hollingsworth
Fred W. Maerke
Philip R. Pryde
David Rorick, Jr.
Herbert H. Stickney

FISCAL POLICY

Dale Mason, Chairman
Craig S. Andrews
Philip E. Berg
Laena Dashiell
James A. Ferrara
John F. Hennigar
William Hollingsworth
W. E. Klostermann
Joseph Parker
Paul A. Peterson
Herbert H. Stickney

ENGINEERING AND OPERATIONS

Craig S. Andrews, Chairman
Hans H. Doe, Vice Chairman
Francesca M. Krauel, Liaison
Sherwood D. Anderson
Philip E. Berg
Linden R. Burzell
John M. Cranston
Tom Crownover
Lawrence Hirsch
Ward Oden
Joseph Parker
Richard G. Zogob

PUBLIC INFORMATION

Michael D. Madigan, Chairman
Fred W. Maerke, Vice Chairman
Dale Mason, Liaison
Alan D. Archibald
Charles F. Cooper
Tom Crownover
Robert M. Dodd
James A. Ferrara
W. E. Klostermann
John P. Starkey
Mark W. Watton
Richard G. Zogob

LONG RANGE PLANNING

Charles F. Cooper, Chairman
Gordon W. Tinker, Vice Chairman
Dale Mason, Liaison
Alan D. Archibald
Harry Griffen
Lawrence Hirsch
John M. Leach
Paul A. Peterson
Philip R. Pryde
David Rorick, Jr.
Mark W. Watton

WATER POLICY

John F. Hennigar, Chairman
Sherwood D. Anderson, Vice Chairman
Francesca M. Krauel, Liaison
Paul L. V. Campo
John M. Cranston
Hans H. Doe
Susan Golding
Harry Griffen
Michael D. Madigan
Ward Oden
John P. Starkey
Gordon W. Tinker



San Diego County Water Authority

2750 Fourth Avenue, San Diego, California 92103-6295 (619) 297-3218

Official Agency Organization, June 9, 1946

Francis M. Kneel, Chairman
Dale Masch, Vice Chairman
Michael D. Wagner, Secretary
Lawrence R. Michaels, General Manager
W. D. Chaffin, Chief Engineer
Paul J. England, General Counsel

January 12, 1987

Board of Directors
San Diego County Water Authority

The Fortieth Annual Report of the Water Authority, covering activities during the fiscal year ending June 30, 1986, has been prepared and is transmitted herewith.

Rainfall for 1985-86 was above normal for the year. Water deliveries of 488,124 acre feet were 12% over the previous year while local water production of member agencies was 75,477 acre feet, or about 70% of 1984-85. The water in storage on June 30, 1986 was 339,511 acre feet, which was 61% of capacity and 5.5% more than the June 30, 1985 amount. The Authority population grew by 58,500 to 2,105,500, which is 97% of the County population.

Except for the construction of the new San Diego #13 service connection, no capital improvements were completed this year. The initial draft of an updated planning report defined several new projects required in the near future to maintain the present level of service to member agencies. The most urgent are modifications to the First Aqueduct north of Escondido, a filtered water pipeline to serve Ramona and a parallel Pomerado Pipeline to alleviate hydraulic problems of a shared pipeline with the City of San Diego.

The two hydroelectric plants that have been in operation since August 1985 produced 9,469,702 kilowatt hours of energy and revenue of \$487,155.61 by the end of the fiscal year.

The Pamo Project was delayed by the Corps of Engineers' decision to upgrade the Environmental Impact Report and Environmental Assessment with full mitigation to an Environmental Impact Statement prior to issuing the "404" Permit. Under the revised schedule the Final Impact Statement would be completed by early February, 1987 and after a decision that the project is in the public interest, the "404" Permit would be issued in mid-March, 1987.

Very truly yours,

Lawrence R. Michaels

Lawrence R. Michaels
General Manager and Chief Engineer

MEMBER AGENCIES

- CITIES**
- Del Mar
 - National City
 - Poway
 - Escondido
 - Oceanside
 - San Diego

- WATER DISTRICTS**
- Indio
 - Chula Vista
 - San Diego

- IRRIGATION DISTRICTS**
- Santa Fe
 - South Bay

- COUNTY WATER DISTRICT**
- San Marcos

- PUBLIC UTILITY DISTRICT**
- Fallbrook

- MILITARY RESERVATION**
- Camp Pendleton

- MUNICIPAL WATER DISTRICTS**
- Buena Vista
 - Carlsbad
 - Escondido
 - Fallbrook
 - Imperial
 - Jamul
 - Lakeside
 - Miramar
 - Poway
 - San Diego
 - Vista

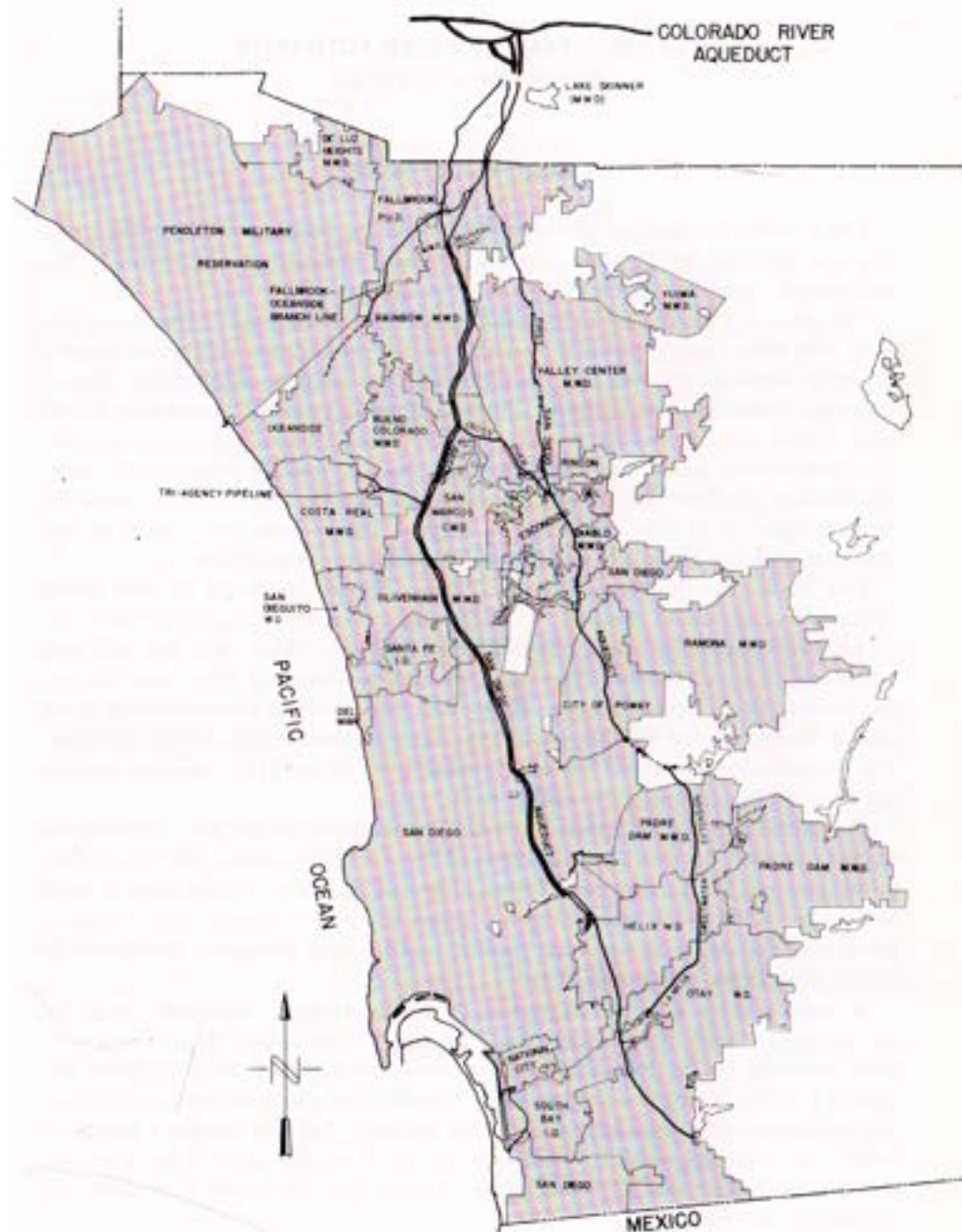


Figure A. Authority Area Within San Diego County

SAN DIEGO COUNTY WATER AUTHORITY
REPORT OF ACTIVITIES

FISCAL YEAR 1985-86

The continued expansion of the economy and the population of the San Diego area is a challenge to the policy makers, planners, designers and operators of the water supply system on which the people are so dependent.

The areas of concern that engaged the energies of the Water Authority during this fiscal year were: seeking out new sources of supply to augment firm water supplies currently available; planning for the processing and delivery of additional filtered water to member agencies; designing of new facilities to make the system workable in spite of heavy peaking and the erratic flows of member agencies and the introduction of chloraminated water. Hydroelectric plants built as appurtenances to the water transmission pipelines add operating constraints, and the operation of pumps by member agencies to take advantage of off-peak power rates have caused serious operating problems because of large variations of flow in the pipelines.

This fiscal year the Pamo Dam and Pipeline Project continued to place heavy demands on the time of the staff. When the project became dependent on the Corps of Engineers because of its jurisdiction under the Clean Water Act, the staff was introduced to a multitude of federal agencies, each of whom had some power to veto the project. Of particular concern during this year were the negotiations with the United States Fish and Wildlife Service over an acceptable biological mitigation plan. The financing for the project was completed with the sale of \$100 million in variable rate financial instruments in November 1985.

The initial draft of an updated facilities master plan for the next 25 years described the need for continual expansion of the Authority system. Most important in the plan was the pressing need for expansion of filtration facilities both at Lake Skinner by MWD and at member agency plants within the County. Local filtration plants have the ability to use water from storage for both emergency supply and to reduce peak flows in the aqueducts.

A major activity was the reactivation of a regional water reclamation study by the Authority under the auspices of a joint City/County Water Reuse Grant with funds provided by the Environmental Protection Agency and the State Water Resources Control Board. The purpose of the investigation is to develop a cost effective and environmentally responsive reclamation program that will provide a supply of lower cost reclaimed water to those uses for which potable water is not required. It is now estimated that 42,900 acre feet of water per year would be available for this purpose in 15 years.

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 of 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 1984, Nat L. Eggert was elected Chairman; Francesca M. Krauel, Vice Chairman; and Dale Mason, 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

Temporary Committees that existed sometime during this year were:

Pamo Dam Steering	Headquarters Office Siting
Hoover Power Allocation	Discharge & Disciplinary Procedures
Land and/or Easement Acquisition Policy	

During fiscal year 1985-86, the following Directors were presented with service emblems:

Director	Length of Service
Robert M. Dodd	15 years
John P. Starkey	10 years
Alice C. Tang	6 years
Michael D. Madigan	6 years
Fred W. Maerkle	6 years
Alan D. Archibald	3 years

During the year the following Directors were seated or reelected:

Date	Director	Agency	Term Expires
July 11, 1985	George T. Yackey	De Luz Heights M.W.D.	July 19, 1991
	Richard G. Zogob	South Bay I.D.	Nov. 11, 1988
Sept. 12, 1985	Philip R. Pryde (replaces Roy W. Lessard)	City of San Diego	May 2, 1991
Feb. 13, 1986	Linden R. Buzzell (replaces F. D. Fitzsimmons)	Yuima M.W.D.	Jan. 9, 1988
Feb. 13, 1986	Susan Golding	County of San Diego	Feb. 12, 1992
Mar. 13, 1986	Philip E. Berg (replaces George F. Yackey)	De Luz Heights M.W.D.	July 19, 1991
Mar. 13, 1986	Dale Mason	San Marcos County W.D.	Mar. 7, 1992
Apr. 10, 1986	Ward Oden (replaces Fred H. Reese)	Ramona M.W.D.	Oct. 2, 1987
May 15, 1986	William Hollingsworth (replaces Howard G. Golem)	Olivenhain M.W.D.	Aug. 4, 1990
	Francesca Krauel	City of San Diego	Mar. 7, 1992
	John M. Leach (replaces Janet Erickson)	City of San Diego	Jan. 28, 1992
	Joseph Parker (replaces Alice C. Tang)	City of San Diego	Mar. 7, 1992
June 12, 1986	George M. Lohnes (replaces Robert M. Dodd)	City of Escondido	Oct. 18, 1986

SIGNIFICANT BOARD ACTIONS

July 11, 1985

- Resolution:** Honored Director and former Chairman Lloyd L. Lee who died on June 29, 1985.
- Resolution:** Honored Director and former Chairman of the Metropolitan Water District of Southern California Earle C. Blais upon his retirement from that Board.
- Motion:** Approved the low bid of Continental Chemical Company to supply chlorine for the 1985-86 fiscal year.
- Resolution:** Amended Resolution 84-35 to provide for payment of an additional \$3,582,547 to Metropolitan Water District for additional water purchased during 1984-85.
- Resolution:** Authorized the purchase of telephone equipment from Inter-Tel for \$20,671.
- Motion:** Approved an annual salary of \$69,500 for the General Manager and Chief Engineer.
- Motion:** Approved the hiring of Jack Meek MAI, of the Cotton-Ritchie Corporation to prepare an appraisal of the Pamo Pipeline right-of-way.

August 8, 1985

- Motion:** That the Board take no position on Assembly Bill 1287 requiring water purveyors to install water and energy conservation retrofit services.
- Motion:** (1) To support Assembly Bill 2133 which establishes primary drinking water standards and specifies maximum contaminant levels . . . for all substances which may adversely affect human health and (2) to oppose Assembly Bill 859 relating to contaminants in drinking water.
- Resolution:** Urged the approval by Congress of HR 3113 and S 1192 which would implement the Coordinated Operations Agreement by providing about 200,000 acre feet of Central Valley Project water to the State Water Project.

August 15, 1985 (Adjourned Meeting)

- Resolution:** Established the vote of the representation of member agencies to the Authority Board as determined by assessed valuation for fiscal year 1985-86.
- Resolution:** Fixed the tax rate for fiscal year 1985-86 at \$.00531 for \$100 of assessed valuation.

September 12, 1985

- Resolution:** Amended Article 17 of the Administrative Code to establish rules for the discipline or discharge of a public employee in keeping with current laws guaranteeing employee rights.
- Resolution:** Amended Article 10 of the Administrative Code regulating Authority purchases by requiring formal bids on purchases over \$10,000 (raised from \$4,000), and Board approval on purchases over \$25,000 (raised from \$10,000).
- Resolution:** Amended Article 16 of the Administrative Code to formally clarify and restrict personal use of Authority vehicles.
- Motion:** Granted the fee increase to General Counsel and his staff.
- Motion:** Authorized the General Manager and Chief Engineer to execute a contract with Robert A. Rauch for the purpose of evaluating the Authority's public information program.
- Resolution:** Authorized the application for a water reclamation loan in the amount of \$6 million from the California State Water Resources Control Board.

October 10, 1985

- Resolution: Approved the Work Order for the design and construction of Buena Colorado No. 10 service connection on the Tri-Agencies Pipeline at an estimated cost of \$118,500 which will be received from Buena Colorado M.W.D.
- Resolution: Authorized the General Manager and Chief Engineer to accept easement and other interests in real property without Board approval.
- Resolution: Reopened Work Order 1-17 for Pipeline 3 corrosion repairs and appropriated \$27,287.37 from the General Fund to compensate Otay Water District for labor and pumping costs incurred during the shutdown in early 1985.
- Motion: Authorized the staff to enter into a one year agreement with Mr. William R. Gianelli as special consultant for the Pamo Dam Project.
- Motion: Provided for ratification by the Board of September 19, 1985 letter to the Chairman of the Metropolitan Water District signed by Chairman Eggert and the Authority's Metropolitan delegates that restates the Authority's position on preferential rights.

October 17, 1985 (Adjourned Meeting)

- Resolution: Authorized the printing and distribution of a preliminary official statement and the distribution of drafts of certain documents in connection with the Water Authority's adjustable, convertible extendable securities (ACCESSM) series 1985.
- Resolution: Authorized the appropriation of \$380,000 for legal fees and the payment for rights-of-way acquired from Western Salt Company.

November 14, 1985

- Motion: Directed staff to implement the recommendation concerning the public information program made by consultant Robert A. Rauch.
- Motion: Directed the staff to purchase an additional \$5 million in liability insurance from the Percy Goodwin Company at maximum premiums of \$50,000 for one year. Effective October, 1985 the ACWA Joint Powers Insurance Authority (JPIA) had reduced their coverage from \$20 million to \$5 million and Percy Goodwin Company reduced their \$20 million to an offer of \$5 million for \$50,000.
- Resolution: Authorized the execution and contracts of indebtedness, a trust agreement, a remarketing agreement and an official statement in connection with the San Diego County Water Authority Certificates

of Participation to finance the Pamo Project at an initial interest rate not to exceed 5 3/4%.

- Resolution: Honored Edward G. Brown upon the 25th anniversary of the approval of the State Water Project by the voters of California.

December 12, 1985

- Resolution: Approved the San Diego County Water Authority Urban Water Management Plan and authorized the General Manager and Chief Engineer to implement the conservation measures included therein.
- Resolution: Amended the Administrative Code to provide for Ex Officio membership of the County of San Diego.
- Resolution: Authorized the purchase and installation of \$75,500 of control equipment for the Miramar and Alvarado hydroelectric plants.
- Motion: Authorized the General Manager and Chief Engineer to execute a storage contract with the Metropolitan Water District to store 10,000 to 20,000 acre feet of water in San Vicente Reservoir each year.

January 9, 1986

- Resolution: Approved work order for the design and construction of San Marcos County Water District No. 5 service connection for which San Marcos had advanced \$140,000.
- Resolution: Reaffirmed the need for Pamo Reservoir and the Board's commitment to the long-term biological mitigation goals.
- Motion: Authorized the purchase of an additional \$5 million of liability insurance coverage from ACWA Joint Powers Insurance Authority for an annual premium of \$56,650.

February 13, 1986

- Motion: Authorized the General Manager and Chief Engineer to resume work on the San Pasqual Groundwater Basin study.
- Resolution: Authorized the General Manager and Chief Engineer to sign the Memorandum of Agreement relating to the archaeological mitigation for the Pamo Project.
- Resolution: Appropriated \$1,692,032.74 for the completion of the final design, acquisition of pipeline rights-of-way, and some mitigation work for the Pamo Project and to execute a revised contract with consultant Dames & Moore.

SAN DIEGO COUNTY WATER AUTHORITY

Guest Speaker: Carl Boronkay, General Manager of the Metropolitan Water District, reported on the status of the MWD/Imperial Irrigation District negotiations for use of their conserved water. He discussed other efforts to obtain additional water from Palo Verde Irrigation District and the Kern County Water District.

March 13, 1986

Motion: Approved payment of \$15,000 or in-kind contribution towards the preparation of the Comprehensive Species Management Plan by SANDAG under AB 1909 (Stirling).

Resolution: Adopted Water Policy Statements of the SANDAG/SDCWA Joint Task Force on Regional Water Supply as the Authority's official position on regional water supply issues.

April 10, 1986

Resolution: Authorized the design and construction of Olivenhain M.W.D. Service Connection No. 3 for which Olivenhain advanced \$152,000.

Resolution: Appropriated \$250,000 for the relocation of a section of the La Mesa-Sweetwater Extension in property owned by California Department of Transportation which is to be improved.

Resolution: Appropriated \$40,360 for additional easements along Pipeline 3 south of Sweetwater Reservoir.

Motion: Authorized the General Manager and Chief Engineer to spend \$40,000 towards the preparation of the Pamo Project Environmental Impact Statement in the format requested by the Corps of Engineers.

Motion: Authorized \$10,000 for a study of the economic effects on agriculture if the Colorado River and/or State Project aqueducts were severely damaged by an earthquake. Consultant Alan P. Kleinman of Great Western Research, Inc. will prepare the study.

Motion: To endorse the following current water legislation: AB 3722 (Costa), AB 3351 (Isenberg), an amended version of AB 4309 (Peace), Propositions 44 and 51 on the June, 1986 ballot, and to remain neutral on AB 2746 (Katz) and SB 1908 (Ayala).

Resolution: Authorized execution of an agreement between the Metropolitan Water District, the San Diego County Water Authority, and the Sweetwater Authority for the storage and use of water in Sweetwater Reservoir.

May 15, 1986

Resolution: Established the treated water rate for the fiscal year 1986-87 at \$40.00 per acre foot.

BOARD OF DIRECTORS

Motion: Approved a 1986-87 employee salary/fringe benefit package that increased compensation 4.56%.

Resolution: Raised the appropriation for treated and untreated water for the fiscal year 1985-86 by increasing the total budget from \$96,958,521 to \$107,712,171.

June 12, 1986

Resolution: Approved the San Diego County Water Authority budget for the fiscal year 1986-87 and appropriated \$104,162,508 for expenditure thereunder.

Resolution: Approved a 20,000 acre feet increase in the Authority's interruptible storage allocation from Metropolitan Water District and amended the 1985-86 water purchase appropriation to prepurchase 10,000 acre feet in 1985-86 and the remaining 10,000 acre feet would be prepurchased from the 1986-87 budget.

Administration

Executive Officers

Lawrence R. Michaels	General Manager and Chief Engineer
Paul D. Engstrand	General Counsel
Janet Raviart	Executive Secretary

Administrative Staff

Arthur R. Bullock	Assistant General Manager
Robert E. Melbourne	Assistant Chief Engineer
Henry G. Lozano	Director of Finance
Irwin E. Nichols	Superintendent
Pete Rios	Government/Community Affairs Officer
Larry G. Hobson	Project Construction Engineer

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, 1986 the Authority had 49 regular full-time employees and two part-time employees. Two secretaries are on long-term disability and are being replaced by temporary employees. Sixteen were employed in the San Diego office and thirty-three worked out of the Fred A. Heilbron Operations Center in Escondido. The longevity of the employees is as follows:

Years of Service	Number of Employees
over 30	1
over 25	4
over 20	2
over 15	15
over 10	3
over 5	7
under 5	17

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 Authority pays for employee's P.E.R.S. contribution except for the older employees. 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 Shield administered health plan, a California Dental Service dental plan, eye-care insurance program, 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 25 days of vacation after 25 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 and the conversion of sick leave in excess of 60 days to annual leave on a two for one basis.

The employees, through their Employees' 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.

Every spring in conjunction with the preparation of the budget for the following fiscal year a list of the classified positions to meet the needs of the Authority, along with the appropriate salary range, is recommended to the Board of Directors by the General Manager and Chief Engineer. After consideration of the staffing requirements within the framework of the budget, anticipated capital improvement projects, and the current changes in the cost of living index, the salaries are established by the Board. The General Manager and Chief Engineer is authorized to make a limited number of semi-annual merit increases within the constraints of the established salary range and the budget.

This year the General Manager and Chief Engineer has instituted an employee evaluation and review system which not only will be of benefit to the supervisors in working with those under them but will benefit the employee in that he can be more confident about his performance. In general the interview phase has opened up meaningful dialogue and improved communications.



Employees Association potluck dinner held in San Diego Office February 1986.

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 the distinguished water attorney, 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 augment local water supplies which were rapidly becoming inadequate.

Area

The Authority encompasses 904,006 acres (1,412.5 square miles), a net increase of 1,304 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 210,486 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 31, 1985.

The statement for calendar year 1985 contained five annexations 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, 1986, was estimated to be 2,166,169 people of which 97 percent live within the Authority service area. The average annual growth rate within the Authority service area for the period from 1946 to 1986 was 3.99 percent. The population within the Authority service area was estimated to be 2,105,500 persons on June 30, 1986, an increase of 58,500 or

2.9 percent from the June 30, 1985, estimate of 2,047,000. Population statistics are contained in Table 2 and Table 3.

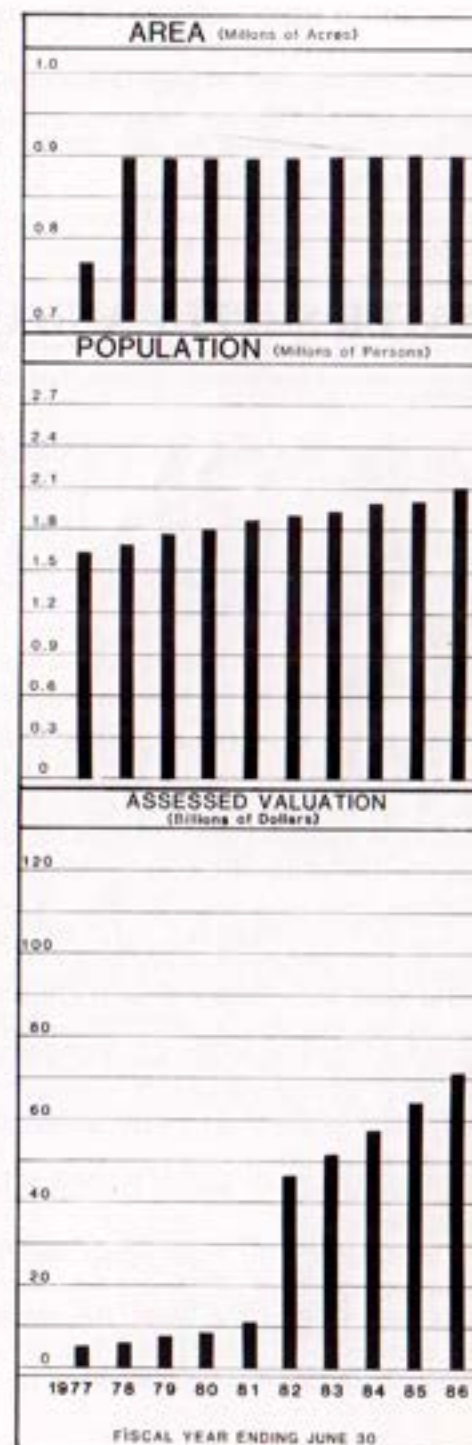
The City of San Diego, largest member agency of the Authority in area, leads the member agencies in population with 1,009,500 persons, approximately 48 percent of the Authority total. De Luz Heights Municipal Water District has the smallest population with 265 persons and the lowest density of 0.02 persons per acre. The average population density within an identifiable political entity is 9.14 persons per acre in the City of National City.

The average population density of the Authority increased during the fiscal year from 2.27 to 2.33 persons per acre or 1,491 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 1985-86, according to the County Auditor's certification, was \$71,388,143,316, an increase of \$7,556,317,816 or 11.8 percent from the 1984-85 certified valuation of \$63,831,825,500.



The average assessed valuation of property within the Authority service area increased from \$70,712 per acre in 1984-85 to \$78,969 per acre in 1985-86. 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 is 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 29.5 percent of MWD's supply in 1985-86. The Authority has a preferential right to 11.23 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 Aqueduct to the terminus 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 where it is blended with Colorado River water which then flows 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 1986, the blend in Lake Skinner was 50 percent Colorado River water and 50 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, had a treatment capacity of 340 million gallons per day (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, the other untreated pipeline, is the crossover diversion structure at San Marcos. The Tri-Agencies Pipeline, a branch line that extends about 4.4 miles westerly from San Marcos, delivers treated water to service areas of Bueno Colorado Municipal Water District, the Costa Real Municipal Water District, and the City of Oceanside at an elevation that previously would require pumping.

To maximize the flexibility of the system, several crossover connections have been constructed since 1965. One such facility is the pipeline from the Second Aqueduct at the diversion structure in Twin Oaks Valley to the First Aqueduct in 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 raw 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.

In July 1985, two hydroelectric plants were completed. The Miramar Plant has two turbine/generator units with a name plate generating capacity of 400 kilowatts per unit. The Alvarado Plant has two units with generator ratings of 1,050 kilowatts per unit.

Supervision and control of the San Diego Aqueduct system and the hydroelectric plants are 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 and telemetering system. Communication with operating and maintenance field staff and with MWD's East Valley Operations Section at Lake Skinner is by two-way radio.

Deliveries and Rates

The San Diego County Water Authority aqueducts received 488,124 af from MWD during the fiscal year. Untreated water accounted for 332,430 af, and the balance of 155,694 af of water was treated at the Skinner Treatment Plant in Riverside County. This total flow of 488,124 af was 51,278 af more than the previous fiscal year which represents an 11.7 percent increase. The lowest flow rate averaged 344 cubic feet per second (cfs) in February 1986. The highest average delivery of 964 cfs occurred during July 1985. The average for the entire year was 674 cfs. Water deliveries to member agencies and others during the fiscal year are shown in Table 8. Purchases by member agencies totaled 474,955 af, of which 386,838 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 1978-79 through 1985-86, and total water sales from 1947-86, 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 per acre foot. The tax revenues from assessed valuations of property within the Authority for fiscal year 1985-86, as determined by the County Assessor, was set at \$.00531 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 when water was \$58 an acre foot, water rates have been increased yearly to \$197 an acre foot in fiscal year 1983-84. For the years 1984-85 and 1985-86, the rate remained the same at \$197 an acre foot due to the leveling off of inflation and the cost of energy for pumping. With a return to a higher demand for water because of lower rainfall and increased water sales, MWD decreased the water rate \$5 to \$192 per acre foot for the fiscal year 1985-86. The projected rate for 1986-87 has been established once again at \$197 per acre foot.

The MWD rate for untreated, non-interruptible water for municipal and industrial use was \$192 for fiscal 1985-86 to which was added the Authority's surcharge of \$10 per acre foot. Treatment charges by MWD at the Skinner Treatment Plant were \$32 per acre foot 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 and with limited or no access to the filtered water pipelines. The commodity charge by the Authority for treatment of water for fiscal 1985-86 was \$39 per acre foot.

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	70.00
7/01/81	7/01/82	96.00	9.00	105.00	35.00	70.00	89.00
7/01/82	7/01/83	114.00	10.00	124.00	35.00	89.00	110.00
7/01/83	12/31/84	144.00	10.00	154.00	44.00	110.00	163.00
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
7/01/86	7/01/87	197.00	10.00	207.00	44.00	163.00	163.00

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. The total storage that qualified for the municipal and industrial interruptible rate was 100,000 acre feet.

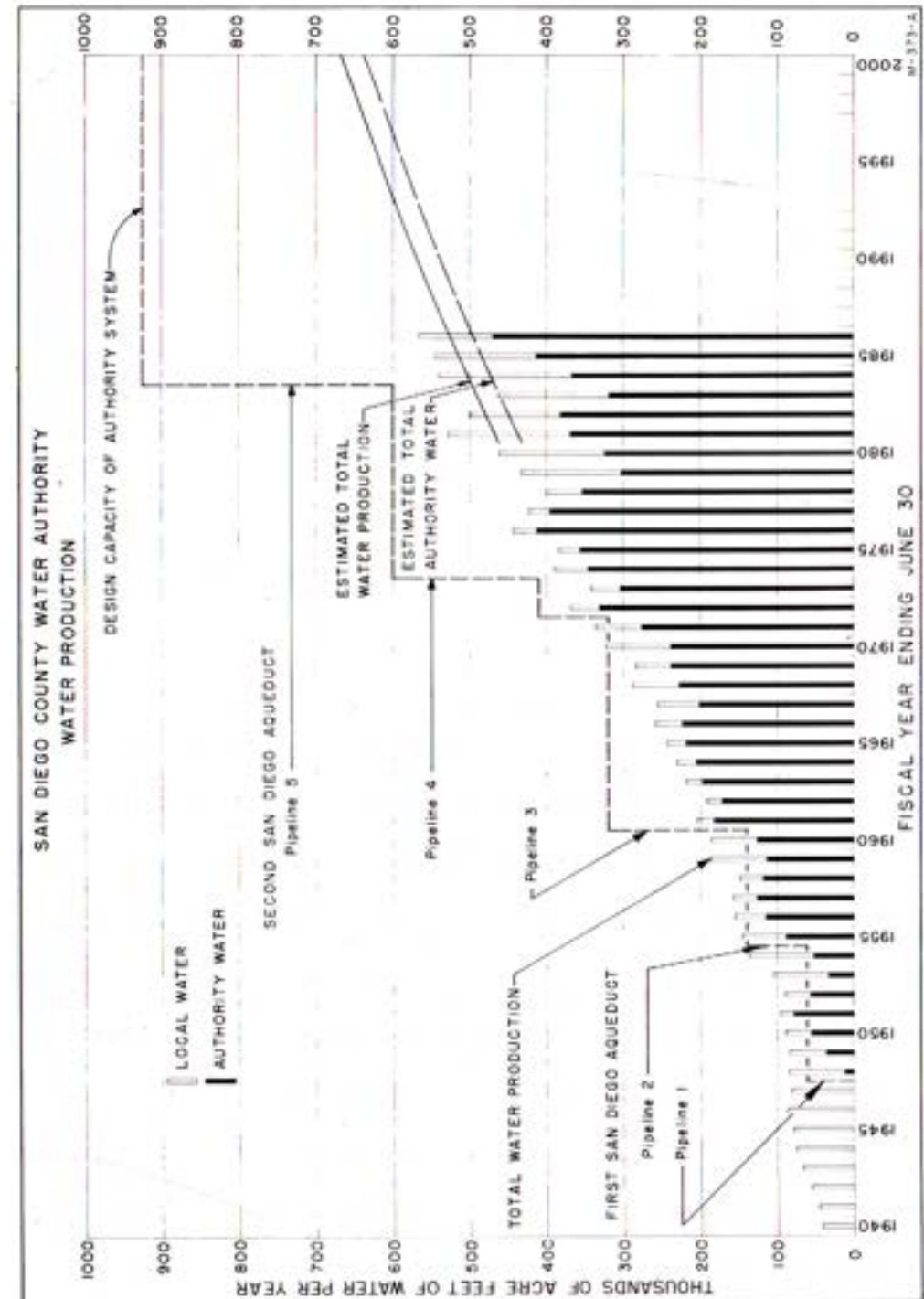


Figure B. Water Production of Authority Member Agencies

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 operating reservoirs, and metering discrepancies. Sources include impounding reservoirs, wells, and the Authority system.

Total water production from each of the 24 member agencies of the Authority is shown in Table 4. During 1984-85, the total water production was 545,213.8 af. The water production for the current year 1985-86 is 565,600.7 af which is an increase of 20,386.9 af or 3.7 percent. The highest monthly production occurred during July 1985 when 70,248.7 af of water were used. This was more than the record high month of July 1984 when 65,263.7 af were used. The lowest monthly production occurred during February 1986 when 24,676.7 af of water were used. The Authority supplied a high of 85.9 percent of the water production during the month of April 1986 and 82.9 percent of the production for the fiscal year 1985-86.

Rainfall for 1985-86 was above normal as shown below:

Location	Rainfall	Percent of Normal
Lindbergh Field	14.10 in.	151%
Lake Cuyamaca	37.50 in.	99%
Lake Henshaw	32.15 in.	124%

Local and imported water stored in regional reservoirs increased from 321,789 acre-feet on June 30, 1985, to 339,511 acre-feet on June 30, 1986, which is an increase of 5.5 percent.

The City of San Diego maintains the most extensive system of impounding reservoirs in the Authority service area. This system produced 49,963.5 af of water during the fiscal year, and out of this the City of San Diego sold 5,611.1 af to the California-American Water Company for delivery to Coronado and Imperial Beach. Helix Water District produced 3,698.8 af from Lake Cuyamaca and its wells in the El Monte Basin. The Vista Irrigation District (part of Bueno Colorado Municipal Water District) produced 13,110.3 af from Lake Henshaw and the Warner Ranch wells. The City of Escondido produced 9,924.4 af from the Henshaw-Wolford system, and 1,605.2 af were produced within Yuima Municipal Water District from the Pauma Valley wells. Sweetwater Authority produced 6,012.1 af from the Sweetwater system and wells for use in National City and South Bay Irrigation District.

Eleven of the 24 member agencies are 100 percent dependent on imported water. The thirteen remaining agencies vary from 99.4 percent (Valley Center) to 25.4 percent (Bueno Colorado) 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.

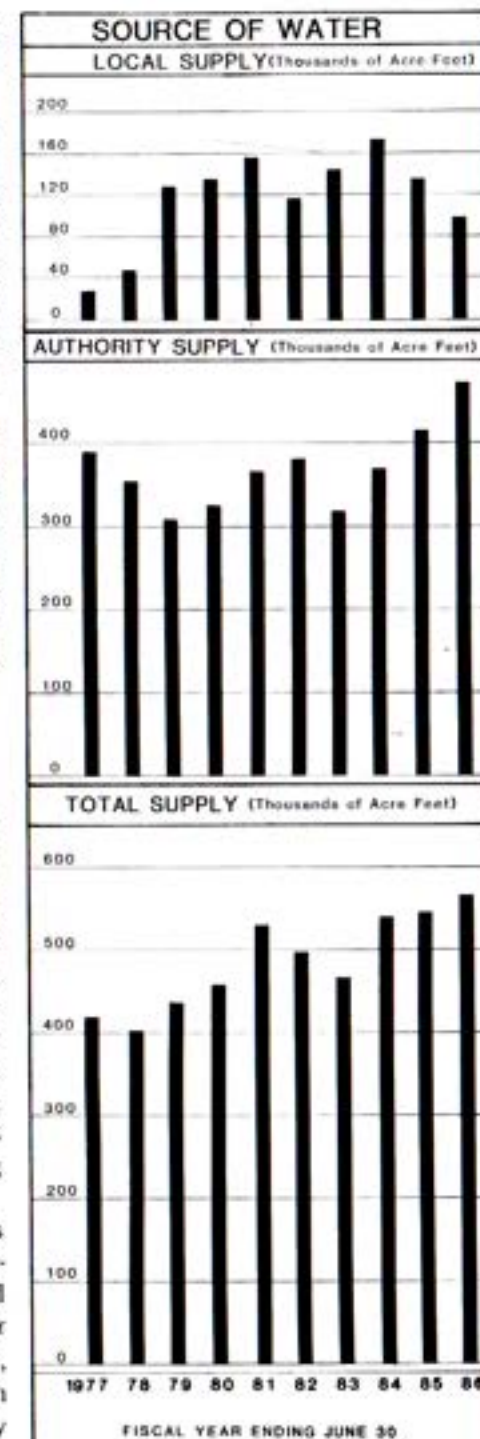
Average daily per capita consumption of municipal and industrial water for fiscal year 1985-86 was 192 gallons per day. This is up from 189 gallons per day during the previous year and 185 gallons per capita per day two years ago. It is estimated that the Authority serves approximately 57% of the geographical area within its boundaries.

The combined water production of Authority member agencies is shown in Figure B. The unshaded area 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 seasonally 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 normally ranged from 1.0 to 6.0 Turbidity Units (TU) but in March 1986 it rose to a high of 15.8 units apparently from MWD's testing at their Red Mountain Power Plant.

Algae growth in Authority pipelines is controlled through a program of 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 in Pipeline 3 from Lake Skinner. Pipeline 5 is chlorinated periodically at Lake Skinner to control the algae inside the pipe. 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 treated by MWD. Total hardness ranged from a high of 288 milligrams per liter (mg/l) to a low of 263 mg/l. Water temperature varied from a high of 78.8°F (26.0°C) in July 1985 to a low of 53.6°F (12.0°C) reported in February 1986.

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 269 mg/l to a low of 185 mg/l. Water temperature ranged from a high of 77.0°F (25.0°C) recorded in July and August 1985 to a low of 53.6°F (12.0°C) in December, 1986.

Agricultural Water Use

Agricultural water use by member agencies of the Authority during 1985-86 was 112,049 af which is 166 af more than the previous year's use of 111,883 af. The percentage of agricultural water to the total water production was 19.8 percent, a decrease from 20.5 percent in 1984-85. About 92 percent of water used for agricultural purposes is supplied by the Authority while only 83% 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 83 percent of its water for agricultural purposes but it has no local production. 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 22.0 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 completed in 1985-86, will provide treated water to 13 agencies within the Water Authority requiring treated water.

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

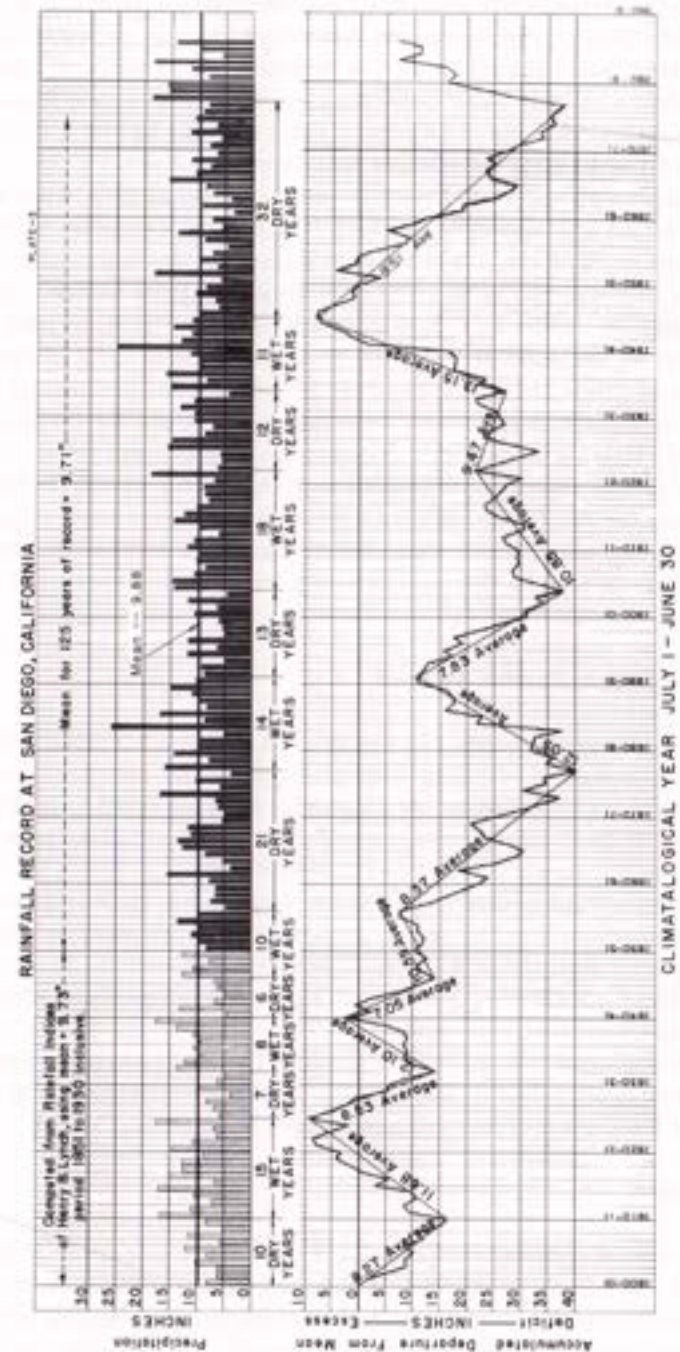


Figure C. Rainfall Record at San Diego, California

(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. The enlarged Skinner Treatment Plant and the Auld Valley pipeline connection to the First Aqueduct will provide treated, blended water in these pipelines in late 1987 as requested by the State Department of Health. This treated water is disinfected by the relatively new chloramination method which introduces ammonia and chlorine into the water and prevents the formation of trihalomethanes (THM). Chloramines maintain a long residual and should not be discharged into natural waterways or blended with chlorinated water. The necessity to avoid the commingling of chloraminated water with chlorinated water along with the abrupt termination of a filtered water line at Escondido without the benefit of a regulatory reservoir to take the pipeline surges, present serious operating problems that will require modification of existing facilities.

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 provisions 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.



New San Diego Service Connection No. 13 at Gillespie Drive and Jamacha Blvd. during construction this year. Note size of pipeline that this connection will serve.



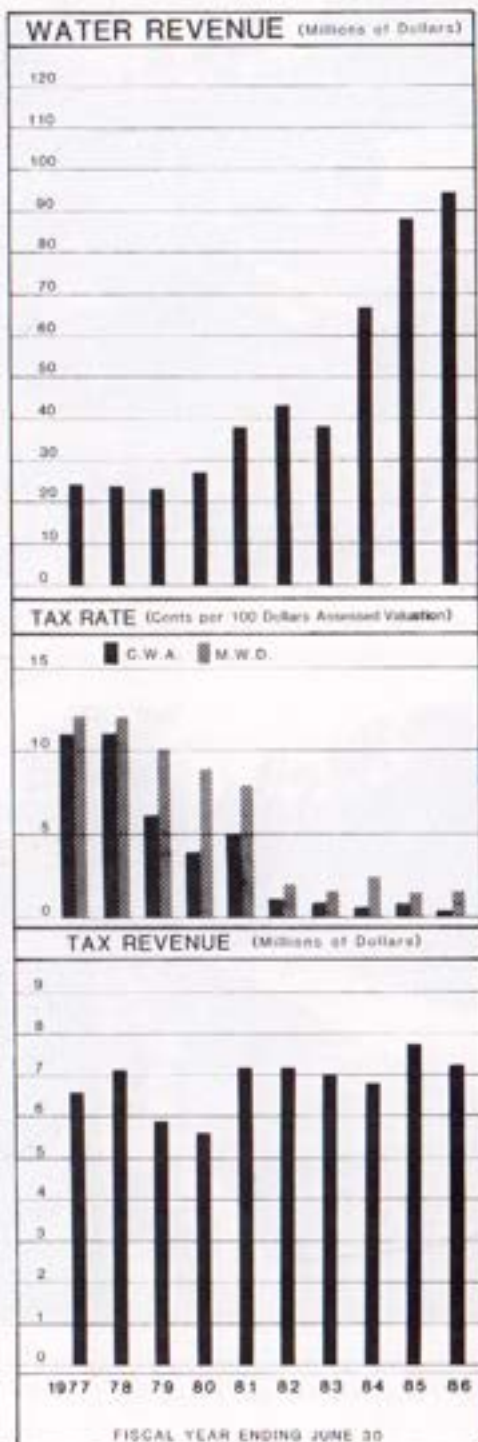
Completed San Diego Service Connection No. 13. Only the steel entry doors and vents near masonry wall are visible.

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 the 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 supports 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.

The Pamo Project, which would add reliability to the Authority's system and provide for the delivery of water to the northerly half of the City of San Diego and to other agencies in the event of an emergency, is well along on its final design and awaiting issuance of the Corps of Engineers' "404" permit.

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

PUBLIC INFORMATION

The public information program has the responsibility to make people in the San Diego region aware of the value of water and, at the same time, the severe limits of this resource. Encouragement of the wise use of water is the basis of the long-term conservation effort rather than an unnecessary reduction in use. Authority programs are coordinated with member agency efforts to avoid duplication of effort while utilizing all opportunities to inform the public.



Joint display by the Water Authority and Metropolitan Water District at the Home and Garden Show at Del Mar Fairground - April, 1986.

Community Relations

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 classes. 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 the 1985-86 fiscal year over 26,600 students in 1812 classes were reached by this program.

During the year speakers from the Water Authority addressed members of community, professional and service organizations, and educational institutions. Staff and board members appeared on television and radio programs to present current water issues to a wider audience. Representatives of the Water Authority participated in conferences and seminars in which water matters critical to the people of San Diego were discussed. Throughout the year press releases alerted the media to the latest in water news. Several hundred articles were printed in area newspapers which reported on the activities of the Water Authority and its member agencies. The articles were often generated by board action and the staff assisted in their preparation.

An annual "Water Report 1985" was produced and widely distributed throughout the county to inform the public about the vital issues before the Water Authority. Pamo Dam, operations, financial activities, interruption of service by earthquakes, water marketing, reclamation and other topics were discussed. A similar 1986 report was being prepared as the fiscal year ended.

The Authority completed a major update of the region's water conservation plans which were originally prepared in 1981 for each member agency, the cities and the county. The effort was in response to AB 797 mandating water management plans for each agency in the state. The Authority's Urban Water Management Plan provides general information on the Authority and its service area and a description of the current water conservation and management activities and those which may be established in the future. The water conservation activities of the member agencies is also addressed.

To eliminate an unnecessary duplication of effort, the Authority assisted most of its member agencies in the preparation of their Urban Water Management Plans. Using a standard format, the Authority provided each member agency with a "basic" report which the agencies then modified to fit their own conditions and returned to the Authority for assembly and printing.

Water displays have been used to effectively impart information on a one-to-one basis at home and trade shows and professional conferences. Displays were made available to member agencies, military commands, community organizations and local governments for use in their water and energy awareness activities.

With 50% of residential water being used outdoors, low-water-using plants can produce major water conservation results. Once planted, they produce water savings year after year. They also have some unique labor saving rewards as well.

Encouraging the use of such landscaping has been an Authority priority since the

1976-77 drought. In 1979 the Authority established a low-water-use landscaping demonstration garden at the Del Mar Fair. The garden has been modified each year to illustrate new techniques.

A cooperative program to bring such gardens to neighborhoods has been implemented in the last two years. The Authority shares design and start-up costs with member agencies that develop such gardens. The City of San Diego, Helix Water District, Fallbrook PUD, Padre Dam MWD, Rincon del Diablo MWD and the County are currently participating in the program. The goal is to have such a garden in every community in the region.

Along with the Authority's continuing low-water-use exhibition garden at the Del Mar Fairgrounds, the Authority gave awards for the best ideas in water conservation, sponsored a high school oratorical contest featuring a discussion on water policy, and an elementary school water poster contest. The 1986 winners in the various categories who were presented their awards at the low-water-use demonstration garden were:

Water Conservation Awards

Individual	Elsie Rusuaskas
Education	Cuyamaca College
Community	San Diego Natural History Museum
Local Government	City of Chula Vista
Federal Government	Naval Air Rework Facility, North Island

Water Policy Oratorical Contest

First Place	Paula Weikel Oceanside High School
Second Place	Kathleen Agbayani Mira Mesa High School
Third Place	Gilbert Bradberry St. Augustine High School

Poster Contest

First Place	Jeanine McHood Harbor View Elementary School Imperial Beach
Second Place	Erick Winters & Nick Wilkers Sunset View Elementary School Point Loma
Third Place	Romel Tungcab Harbor View Elementary School Imperial Beach

The use of television commercials and bus advertising continued through the year. In September, 1985 the Board authorized the hiring of Mr. Robert A. Rouchie of RAR Business Associates to review the effectiveness of the Authority's media efforts. Mr. Rouchie reported back to the Board in November, 1985 with the suggestion that the general water awareness message be replaced by a program of messages that focused on special water issues. The low-water-use gardens and the school program were judged to be very effective.

Government Relations

The Water Authority maintains liaison with the state and federal legislators representing the San Diego area through legislative advocate Ben Clay who also represents the interests of the Authority in Sacramento.

The principal accomplishment on the state level this fiscal year was the agreement on the final language of the Katz Bill (AB2746), which the Governor signed in September, 1986. The intent of this bill is to make water marketing feasible by making water conveyance facilities available for the transfer of water by other than the owner of the facilities.

The application process for the "404" permit required for the Pamo Project by the federal "Clean Water Act" involved the briefing by staff of state and federal legislators, and the Assistant Secretary of the Army. Two trips were made to Washington, D.C. during the year for conferences with federal officials.



The winning entries in the water poster contest sponsored by the Water Authority and Assemblywoman Sunny Mojonnier (75th District).

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, California. The Authority's operation and maintenance force of twenty-six people 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 eight people in aqueduct operations, which include two systems technicians, serve as system operators and also maintain all meters, telemeters, recorders, process control, water disinfection equipment, pumps and hydroelectric equipment. The maintenance force of fourteen includes a warehouseman, a valve service crew and a construction crew that builds new service connections and maintains pipelines and service roads. The chief mechanic, with an assistant, repairs and maintains a sizeable fleet of construction and automotive equipment and has the added responsibility for the yard and warehouse. A secretary at the Escondido Operations Center serves all departments including the project engineering department.

The Fred A. Heilbron Operations Center occupies one city block with five major buildings. The main building houses the aqueduct computerized telemetry control system and offices for operation, maintenance, construction, and field engineering. A shop building has facilities for the repair and service of all Authority vehicles and heavy equipment, and 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 training center building contains two classrooms equipped for waterworks technology training. An on-site residence gives added security, night-time assistance to the aqueduct system operators, and reduction of response time by having equipment ready for the emergency response crews.

A radio system using two different radio relay sites on Palomar Mountain and touch-tone call, connects the Authority base stations at the Operations Center and the San Diego office with Metropolitan Water District's Robert A. Skinner Treatment Plant in Riverside County, and twenty-five Authority mobile radios with nearly all the major San Diego County water purveyors. If either or both relay stations failed, 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 system control room, as well as the offices and shops.

Operations

The Operations Center control room 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 interagency mobile radio answers Authority phone calls at his

home. A pager will notify the duty operator if a telephone contact cannot be made. In emergencies the duty operator is assisted by the superintendent and chief operator who also have interagency radios at home for quick response and field coordination with other agencies.

Of the five pipelines presently serving the Water Authority, #1, #2, #3 and #5 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 that delivery Colorado River water without full sedimentation and filtration treatment. Water in the treated waterline is disinfected with chlorimine (chlorine and ammonia) by M.W.D. at the Robert A. Skinner Treatment Plant.

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

Charts of the service connection meters are changed each week. Flow charts and meter readings are compared for indications of inaccuracies. The calibration of each active meter is checked at least every three months. Meter accuracy is also checked at any time requested by a member agency.

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

Most of the metered flows in the aqueduct system are controlled and displayed on the Authority's operation center 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.

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

For operational emergencies a van used for aqueduct operations and as a mobile electronic repair facility is equipped to be used as an emergency operations center where radio, telephone, and telemeter functions can be monitored.

Authority water is stored in several reservoirs by other water agencies, but principally by the City of San Diego at San Vicente Reservoir. Except in minor amounts,

these water storage facilities cannot return this stored water to the aqueduct for use elsewhere.

During periods of high water demand or low availability, there are connections through which small flows of treated water are put into the aqueduct from the Bueno Colorado Water District, the Helix Water District and the City of San Diego.

There are three pumps at the Authority's Miramar Pump Station available to pump high flows of treated water from the City of San Diego's Miramar Treatment Plant into the aqueduct. These flows are normally available only if additional untreated water can be delivered from the aqueduct to the plant because of limited storage capacity at Lake Miramar. A fourth pump, though installed, is not being used until modifications can be made to correct excessive vibration.

During July, 1985 aqueduct flows for treated water, raw water and total flow set new records. In eleven days the flow exceeded 1000 cfs, including two days over 1100 cfs and a record of 1109 cfs. Skinner Treatment Plant flow reached a new high of 295 mgd (454 cfs).

Also during July, the rejection tower at the terminus of the Fifth Pipeline was utilized for the first time to develop a higher pressure head on the Crossover Pipeline to increase the flow.

A valve operator was installed on a 60-inch valve in the aqueduct just beyond the turnout to the Miramar control station. This valve can now automatically adjust to hold the aqueduct at maximum practical pressure to Miramar for maximum power generation at the Miramar Hydroelectric plant. A flow test on October 29, 1985 was able to deliver 220 cfs to the Miramar Treatment plant, but the hydroelectric plant produced very little power at this peak flow as most of the water was bypassed at the power plant.

Flow tests at the Miramar Pump plant, which pumps treated effluent from the Miramar Treatment plant into the aqueduct demonstrated that pumps P1, P3 and C22 combined could pump 135 cfs.

After one day of operation, the 1000 hp C22 horizontal pump shifted causing a misalignment of the coupling. The pump was realigned and secured by Authority personnel and returned to continuous service.

The pump station was shut down for several days so that the Authority could take maximum treated water from MWD to enable MWD to run flow tests at their Skinner Treatment plant.

Surges in the treated water aqueduct caused by uncoordinated flow changes by MWD and Rancho California Water District, caused water to spill on several occasions at the Miramar and Camp Elliot vent stacks. On three occasions, the surges were large enough to blow the hooded tops off of the large vent structures.

On January 26th, the Skinner plant chlorinator was shut down for about one hour. Combined chlorine residual in the Authority system dropped from a normal 1.2 ppm to about 0.2 ppm. All agencies were notified many hours in advance and no adjustments were made to compensate for this brief drop in chlorine residual.

On February 8th, the aqueduct control computer went down because of loss of both memory disc drives. The computer was placed back in service the same day.

Sound insulation was installed on cabinet doors and thermostats were installed to turn computer cabinet cooling fans on only when needed to reduce the noise level in the control room.

Between February 25th and April 14, 1986, MWD stored 17,733 acre feet of water in San Vicente Reservoir; 230 acre feet was stored in Sweetwater Reservoir between April 14th and April 21st until water demands made further storage at this time impractical.

On May 30th, MWD inadvertently released superchlorinated water from a previously inactive module at the Lake Skinner Treatment plant. Although blended with normal plant effluent water on a 4:1 ratio, there were reports of chlorine residuals of over 5 mg/l (ppm) in the Authority aqueduct system. It took about 20 minutes for this heavily chlorinated water to pass individual agency meters. The Authority was able to warn most agencies well ahead of arrival of this water. Except in isolated instances, the water was diluted within local agencies' water storage systems and no taste and odor was detected by the consumer.

On May 31, Metropolitan Water District had a control valve malfunction at their Red Mountain hydroelectric plant, releasing an additional 150 cfs of water into Pipeline #5 to San Diego. Several aqueduct vents spilled as a result but there was no property damage.

Power outages at the Fred A. Heilbron Aqueduct Operation Center forced the Authority to rely on the emergency generator to keep the center equipment and computer operating. This 75 kw diesel-powered generator was purchased as surplus from the State of California and installed in 1982.

The State Department of Public Health conducted an inspection of the Authority chlorination plant at Rainbow Pass. This comprehensive inspection checks design and operation reliability, security, emergency response, and safety of plant and equipment. The Authority facility and personnel received high marks.

The inadequacies of the new hydroelectric plants were finally corrected with the Authority's operating personnel making the greatest contribution toward making the equipment operational.

The Alvarado Hydroelectric plant was first run overnight on July 11th, and has run almost continually since July 19, 1986, producing as much as 900,000 kilowatt hours per month with revenues ranging from \$23,000 to \$42,000 per month.

Work continued on the Miramar Hydroelectric plant controls enabling it to run overnight for the first time on August 6th.

Power generation at Miramar was increased by automating an aqueduct inline valve in the Miramar valve vault, so as to hold the aqueduct line pressure to near the maximum hydraulic gradient level.

During the first several months of operation, the hydroelectric plants required almost daily attention, with as many as four shutdowns per week because of problems indicated by alarm sensors. In almost all cases, the plants would be running again within three hours.

The two generating plants run unattended with computer readouts in the Escondido Operations Center and automatically call out an alarm when a problem arises.

In June 1986, after disassembling the turbine to remove a 1" X 12" X 76" slab of rubber which had become lodged in an Alvarado Hydroelectric plant turbine wicket gate, other damage was discovered. Several gate pins in butterfly valves were missing, probably due to vibration, and the draft tube showed cavitation damage. This was being corrected as the year ended.

Maintenance

The Authority maintenance yard is located at the Fred A. Heilbron Operations Center in Escondido where all maintenance and force account construction is based. This maintenance yard is located near the center of the aqueduct system with some facilities as much as 40 miles away. For outlying major projects, a field office may be established in an Authority office trailer or in a large combination construction trailer with work benches and a locked storeroom.

Maintenance activities include service, repair and maintenance of Authority buildings, pipelines, roads and equipment. The facilities and equipment maintained include: the Fred A. Heilbron Operations Center buildings, shops and yard; about 222 miles of major pipelines; 130 miles of rights-of-way; 105 miles of Authority roads; 66 buildings housing meters and control equipment; a large volume chlorine station; a pump station with four pumps with motors from 400 to 1,000 horsepower capable of pumping about 180 cubic feet per second; and over 900 underground valve vaults. Two hydroelectric plants, each with two turbines and generators, were added this year. 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 skidloaders, a backhoe, a 5-ton and a 25-ton crane, two forklifts, as well as dump trucks, truck tractors and equipment trailers, compressors, generators, welders, and pumps, including an 8 inch dewatering pump. All pickups and most other trucks have mobile radios for efficiency and quick response.

The Authority maintenance force of twelve maintenance workers and general foreman, two mechanics and a warehouse supervisor normally provide all of the previously mentioned maintenance. They also construct new control and metering facilities, patrol the pipelines for encroachment and damage, and inspect construction projects near the aqueduct pipelines.

The vehicle shop is open up to two hours after the normal working hours to allow for minor repairs and servicing. The shop and warehouse are open every regular working day.

The pipeline and patrol roads are normally checked every week by patrol vehicles. Twice each year the pipelines are checked by foot patrol.

After only three months use, two butterfly valves downstream of the crossover pipeline terminal structure were vibrating badly and obviously near failure. By shutting down one First Aqueduct pipeline at a time on two successive days, July 24th and 25th, it was possible to drain the pipelines and remove the valves with only

Ramona Water District being unable to receive water anytime during the changeover. Inspection showed that several parts of the valve operators were fractured due to vibration and stress.

After being in service for only one month, a valve operator on a 30 inch butterfly valve in the 5th pipeline terminal structure broke its operating fork and the valve slammed shut. The two other parallel valves were inspected and the operators showed stress damage. The positions of the butterfly valves and plug valves ahead of each were reversed to relieve the stress on the butterfly valves.

Cavitation and corrosion caused failure of all four pressure control valves at the Alvarado terminal structure constructed in 1977.

The Oceanside #2 and #3 venturi meters were replaced with sonic meters to achieve higher flows with less pressure loss.

An eight-inch bypass meter for metering low flows was installed around the San Marcos #7 24-inch meter. This meter is also shared by the Costa Real and Olivenhain Water Districts.

The annual Director's tour featured the Pamo Reservoir site and the Miramar Hydroelectric plant.

The three-year Bureau of Reclamation inspection of aqueduct tunnels was made with six persons from the Bureau of Reclamation offices in Denver, Colorado and Boulder City, Nevada. The three southern tunnels were checked and all were in excellent condition.

Force-Account Construction

Only one bid was received for construction of the new San Diego #13 service connection. Because the bid was considered too high, the structure was built by force account. Final cost of the construction was about half of the single bid. This 10' by 35' structure is totally below the surface under Gillespie Street in Spring Valley, and contains a 24-inch 64 cfs meter, valves and electronic control and telemetry equipment.

Construction began during April of 1986 on the new Bueno #10 service connection on the Tri-Agency pipeline, which will serve an area of the Vista Irrigation District. By the end of the year the building and metering/control equipment installation were uncompleted.

Modification of the San Dieguito-Santa Fe service connection was completed. This modification to the valve vault and a new connection to the #3 pipeline will increase the delivery capacity of raw water and increase the flexibility of delivering raw and treated water combinations through the two meters.

DESIGN AND CONSTRUCTION

Pamo Project

The Pamo Project involves the construction of a 264-foot high roller-compacted concrete dam that will be capable of impounding 130,000 acre-feet of water, and 100,000 feet of 54-inch pipeline connecting this reservoir with the First and Second Aqueducts. A pipeline connection to the Sutherland-San Vicente conduit and a hydroelectric plant are also included. The reservoir location is about four miles north of Ramona, and except for three small parcels, yet to be acquired, will inundate land owned by the City of San Diego. The City purchased the property for this reservoir over the years since 1925. The pipeline will extend in a generally westerly direction following Santa Ysabel creek through the San Pasqual Valley, crossing Highway I-15 into West Bernardo Drive and terminating at the Second Aqueduct.

The following steps toward the completion of the project had been taken prior to June 30, 1986.

1. Feasibility Study Report on Pamo Dam and Reservoir, authorized by the Water Authority and the Metropolitan Water District completed in July 1983.
2. Final Environmental Impact Report and Environmental Assessment completed in March 1984.
3. Preliminary Dam Design Report completed in March 1984.
4. Voter approval of \$82 million bond issue completed in November 1984.
5. Application filed for "404" permit with Corps of Engineers in November 1984 and pending completion of EIS.
6. Archeological Mitigation:
 - (a) Memorandum of Understanding with Native Americans signed.
 - (b) Memorandum of Agreement with the Corps of Engineers, State Historical Preservation Officer, Advisory Council on Historic Preservation, Cleveland National Forest, and the Santa Ysabel and Mesa Grande Bands of Mission Indians - document approved on February 13, 1986.
7. Final dam design and preparation of the specifications was 75% complete at end of year.
8. Application for permit and payment of the fee made to Division of Safety of Dams in July 1985.
9. Biological Mitigation Plan prepared in 1985 and modified for inclusion in the EIS at the end of the year.
10. Appraisal of parcels of property required for the pipeline right-of-way completed in December 1985.
11. Pipeline plans and specifications were about 70% complete.
12. Draft Environmental Impact Statement to be completed by October 15, 1986.

Alvarado & Miramar Hydroelectric Plants

In July 1985, the Alvarado Hydroelectric Plant began full-time operation and was followed by the full-time operation of the Miramar Hydroelectric Plant in August, 1985. Ch2M-Hill were the design and construction consultants although the Authority's operation personnel selected and installed the control system. The Axel-Johnson Engineering Corporation furnished mechanical equipment. The turbines were manufactured by Boving & Co., London, England, and the generators were manufactured by Kato Engineering Co., Manakato, Minnesota. The Alvarado plant has two generators with a rated capacity of 1.1 megawatts each and the generators at the Miramar plant are rated at 400,000 kilowatts each. The site work was constructed by DVY Construction of San Marcos.

The following is a month-by-month tabulation of the energy and revenue produced by these plants:

Alvarado		
Month	Kilowatt Hours	Revenue
July	426,137	\$ 25,648.19
August	622,321	37,247.55
September	524,278	30,633.17
October	536,745	29,331.52
November	436,737	23,021.28
December	492,173	25,547.90
January	401,331	21,952.04
February	362,663	20,751.46
March	754,003	42,210.68
April	875,989	40,932.12
May	746,676	25,704.28
June	900,299	29,298.83
1985-86 Alvarado:	7,079,053	\$352,279.02

Miramar		
Month	Kilowatt Hours	Revenue
July	69,016	\$ 4,088.56
August	89,346	5,504.71
September	226,894	12,871.19
October	314,000	16,588.07
November	270,709	14,180.39
December	407,595	21,364.46
January	298,301	16,447.72
February	314,162	17,717.31
March	458,283	25,509.67
April	402,743	14,375.64
May	439,550	15,527.11
June	416,262	13,901.33
1985-86 Miramar:	3,706,911	\$178,076.16
1985-86 Total	10,786,263	\$530,355.18

During the year several agencies requested that new service connections be designed and built. The design of the San Diego #13 Connection was completed during the summer of 1985 and constructed by Authority forces. This City of San Diego connection is at Jamacha Blvd. and Gillespie Drive in the La Presa area. Design for Bueno #10 and San Marcos #5 were completed. Preliminary work was done on Otay #9 and a new connection for Olivenhain. A realignment of a section of the La Mesa-Sweetwater Pipeline within Jamacha Road south of El Cajon was prepared for the California Department of Transportation to accommodate a road widening project.



Bueno No. 10 service connection under construction by Water Authority forces.

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

Two directors were reappointed (Krauel and Mason), eight new directors (Berg, Burzell, Hollingsworth, Leach, Lohnes, Oden, Parker, and Pryde), and one ex officio member (Golding) were appointed during the year.

Section 8 Financing

Assembly Bill 1893 which was introduced on behalf of the Authority by Assemblyman Peace in 1985 was enacted by the Legislature, approved by the Governor, and became law on October 1, 1985. (Stats. 1985, Chapter 1408, p. 696.) It added subsection (b) to Section 8 of the County Water Authority Act. This subsection permits the creation of "an indebtedness by contract up to the amount authorized by and for the purpose authorized by" any proposition approved by a majority of voters under the Revenue Bond Law of 1941.

On October 17, 1985, the Authority commenced utilization of this new financing authority and authorized a Preliminary Official Statement for the issuance of San Diego County Water Authority Adjustable Convertible Extendable Securities (ACES) Series 1985. In November (Resolution 85-40) the Board authorized issuance of \$100 million of San Diego County Water Authority indebtedness (ACES, 1985 series) under authority of Section 8.

Assembly Bill 1893 also made amendments to Section 10 (annexations) and Section 11 (exclusions) of the Act. These amendments clarified certain procedural requirements.

Litigation

Routine litigation concerning easement acquisitions were handled by settlement prior to trial. One case, *SDCWA v. Western Salt Co.*, developed some controversy because the settlement recommendation greatly exceeded original appraisal evaluations. Agreement to settle was reached in October and later finalized.

A significant decision pertaining to the diversion of water from the Sacramento-San Joaquin Delta for both the Central Valley Project (CVP) and the State Water Project (SWP) was rendered, as modified, on June 25, 1986. *United States v. State Water Resources Control Board* (1986) 182 Cal.App.3d 82. It constituted judicial review of the "Water Quality Control Plan for the Sacramento-San Joaquin Delta

and Suisun Marsh" and "Water Right Decision 1485" issued by the State Water Resources Control Board in August 1978.

The "Plan" established water quality standards for salinity control and protection of fish and wildlife. Decision 1485 modified the permits issued to the U.S. Bureau of Reclamation (Decision 893 in 1958 and Decision 990 in 1961) for operation of the CVP. It also modified the permits issued to the Department of Water Resources (Decisions 1275 and 1291 in 1961) for operation of the SWP.

The Court in a 70-page opinion, discussed the numerous legal questions and established guidelines to be followed in future proceedings before the Board. However, it did not evaluate the factual determinations or findings because the Board had scheduled new hearings to reopen its 1978 determinations based upon changing factual circumstances and applicable legal principles.

Undoubtedly, in the next few years important decisions about operational practices for the SWP will result from this decision. The complex interrelationships between water quality standards and water rights will further evolve. Whatever the result it will certainly impact both the quantity and quality of water available, as well as the costs associated therewith, for diversion of water from the Delta for delivery to the Authority via MWD from the SWP.



Presentation of Resolution of the Board of Directors of the San Diego County Water Authority honoring former Governor Edmund G. Brown upon the 25th anniversary of the approval of the State Water Project by the voters of California, I. to r. Los Angeles Councilman John Ferraro, Director John P. Starkey and former Governor Edmund G. Brown.

FINANCIAL REPORT

For the fiscal year ending June 30, 1986, total Water Authority income was \$103,956,000. Total disbursements during the year were \$94,843,000. At the fiscal year end, the Treasurer had control of funds and investments totaling \$119,789,000.

The Director of Finance, Henry G. Lozano, also acts as the San Diego County Water Authority Treasurer and is responsible for all funds not immediately required for the conduct of business. Funds are invested under Board policy in interest bearing 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 the 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 1985-86 the Statement of Earnings is as follows:

STATEMENT OF EARNINGS (Dollars in Thousands)

Income was as follows:	1985	1986
Water sales	\$87,790	\$ 94,010
Taxes	7,833	7,373
Interest on investments	2,179	2,116
Miscellaneous	(77)	39
Hydroelectric sales (net)		418
Total income	\$97,725	\$103,956
Disbursements were as follows:		
Water purchases	\$ 83,350	\$ 89,031
Operation and maintenance	2,492	2,780
Interest expense	1,938	3,032
Total disbursements	\$87,781	\$94,843
Net earnings before depreciation	\$ 9,944	\$ 9,113
As of June 30, 1985 and 1986, the Treasurer's cash accountability was as follows:		
Demand deposits	\$ 10	\$ 27
Time deposits	24,865	25,860
Bond proceeds (in escrow)		93,902
Total deposits	\$24,875	\$119,789

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 has six representatives on the Metropolitan Board of Directors. All are members of the Authority Board. Director Hans H. Doe has served on the MWD Board for twenty-seven 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 twenty-three years. He is a member of the Finance and Insurance Committee, Audit Subcommittee, Special Budget Committee, Nominating Committee, and Water Problems Committee.

John M. Cranston, who has been an MWD Director for eleven years, is a 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 six years. He serves as Vice Chairman of the Finance and Insurance Committee, and is a member of the Land Committee, and the Audit Subcommittee.

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

Francesca Krauel was appointed to the Metropolitan Water District Board of Directors on October 13, 1983, to fill a new directorship position. Ms. Krauel serves on the Organization and Personnel Committee and Land Committee.

Water Sales

MWD Delivered 1,646,852 acre feet of water during fiscal year 1985-86. Delivery to the Authority of 486,579 acre feet represented 29.5 percent of MWD's total deliveries.

MWD has five filtration plants in operation. The Skinner Filtration Plant with a capacity of 340 mgd serves a portion of the treated water requirements of the Authority.

The other plants operated by MWD, none of which can serve the Authority, are: F.E. Weymouth Memorial Filtration Plant in La Verne; Robert B. Diemer Filtration Plant near Yorba Linda; Joseph Jensen Filtration Plant at Granada Hills; and the Henry J. Mills Filtration Plant near Riverside. The Jensen Plant can only receive water from the West Branch of the California Aqueduct.

Tax Rate

MWD set its tax rate at 0.0164 percent of assessed valuation for the 1985-86 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 since 1930 is shown in Table 12. The total MWD tax levy during the 1985-86 fiscal year, including regular and special taxes, was approximately \$80,568,936 of which \$12,192,951, or 15.13 percent, was levied against property within the Authority. The estimated tax level for the 1986-87 fiscal year is \$77,064,663 for MWD as a whole and includes \$10,826,904 for the Authority's service area.

**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. The Board was reorganized in April 1977 and enlarged from six to eleven members, pursuant to legislation enacted in 1976. Under the revised statutes, the Governor is to appoint both a member and an alternative member to the Board from a list of nominees designated by each of the six agencies. Additional legislation, effective in 1985, was enacted in 1983 and 1984 to improve the method of appointment and replacement of the six agencies' representatives on the Board and the selection of a Chairman. The legislation also reduced the size of the Board to ten members, eliminating one public member.

The member and the alternate representing each of the six agencies are chosen by the Governor from two lists, each containing not less than three persons, that are submitted by each of the 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. There are also two public board members appointed by the Governor. The Board elects from among its members, other than the two State officers, a Chairman who is ex officio the Colorado River Commissioner.

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

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.

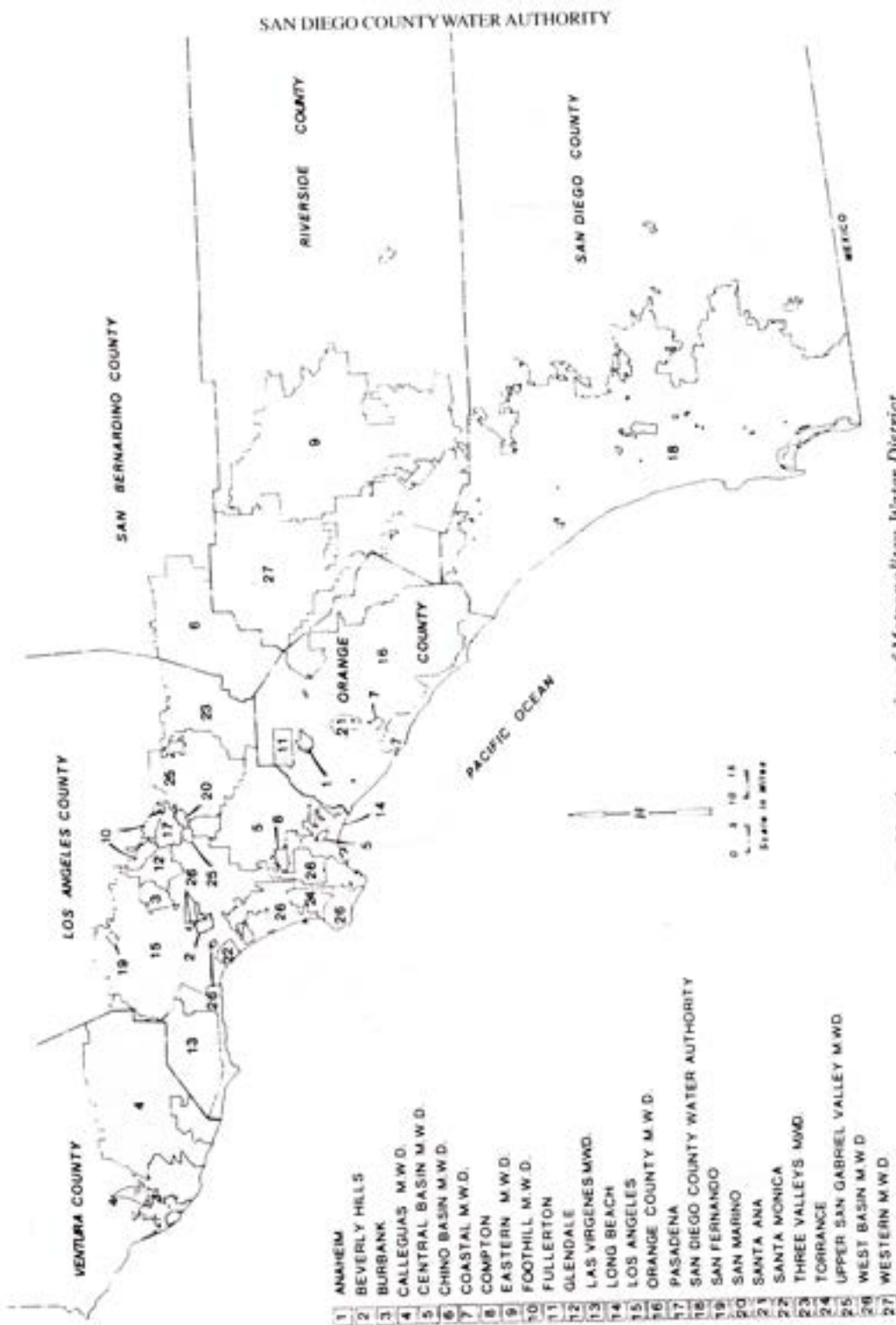


Figure E. Member Agencies of Metropolitan Water District

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SAN DIEGO COUNTY WATER AUTHORITY

Table 1
STATISTICAL SUMMARY

	1984-85	1985-86	Percent Change
GROWTH OF AREA			
Number of Agencies	24	24	-0.
Total Area - Acres	902,702	904,006	+0.1
Population	2,047,000	2,105,500	+2.9
Assessed Valuation	63,831,825,500	71,388,143,316	+11.8
OPERATIONS			
Water Imported by Authority-ac. ft.	436,846	488,124	+11.7
*Water Production of Agencies-ac. ft.	545,214	565,601	+3.7
*Local Water Used-ac. ft.	133,634	96,562	-27.7
*Authority Water Used-ac. ft.	411,580	469,039	+14.0
Miles of Pipeline	222	222	-0.
Miles of Patrol Roads Maintained	106	105	-0.9
Number of Service Connections	74	75	+1.4
FINANCIAL			
Revenues:			
Water Revenue	87,790,084	94,010,000	+7.1
Other Revenue	2,102,132	2,573,000	+22.4
Taxes	7,833,156	7,373,000	-5.9
Expenditures:			
Operation and Maintenance	2,492,275	2,780,000	+11.5
Purchase of Water	83,350,122	89,031,000	+6.8
Payments on Outstanding Debt	4,699,575	4,794,000	+2.0
Total Investment in Plant:			
Total Fixed Assets	135,473,441	135,362,000	-0.1
Long-Term Debt	59,888,360	148,094,000	+147.3

*Does not include Pendleton Military Reservation

TABLES

Table 2
POPULATION GROWTH - COUNTY AND AUTHORITY AREA
1910 to 1986

(Includes Resident Military Personnel)

Year (as of April 1)	COUNTY		AUTHORITY		Percent of County Population in 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	42,471	(5) 2,006,239	40,761	98
1985	(7) 2,083,359	82,810	(5) 2,047,000	58,500	98
1986	(7) 2,166,169		(5) 2,105,500		97

(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.

SAN DIEGO COUNTY WATER AUTHORITY

Table 3
AREA - AUTHORITY MEMBER AGENCIES

Member Agencies	Area Within Authority			Percent of Total Authority Area 6/30/86
	As of 6/30/85 (acres)	Changes During Year (acres)	As of 6/30/86 (acres)	
Bueno Colorado M.W.D. (2)	19,838	-2	19,836	2.19
In City of Vista	(10,196)		(11,000)	(1.22)
Costa Real M.W.D. (3)	20,369	-0-	20,369	2.25
In City of Carlsbad	(22,710)		(24,000)	(2.65)
Del Mar, City of	1,159	-0-	1,159	0.13
De Luz Heights M.W.D.	11,789	-0-	11,789	1.30
Escondido, City of (12)	16,556	+4,636	21,192	2.34
Fallbrook Public Utility Dist.	16,174	-0-	16,174	1.79
Helix Water District (4)	31,663	-385	31,278	3.46
In City of El Cajon	(9,052)		(9,055)	(1.00)
In City of La Mesa	(5,762)		(5,762)	(0.64)
In City of Lemon Grove	(2,432)		(2,432)	(0.27)
National City	5,524	-0-	5,524	0.61
Oceanside, City of	25,694	-0-	25,694	2.84
Olivenhain M.W.D. (5)	27,296	-30	27,266	3.02
Otay W.D. (6)	62,858	-0-	62,858	6.95
Padre Dam M.W.D. (8)	54,118	+385	54,503	6.03
In City of Santee	(10,880)		(11,200)	(1.24)
Pendleton Military Res	134,625	-0-	134,625	14.89
Poway, City of	22,809	-0-	22,809	2.52
Rainbow M.W.D. (10)	46,858	+403	47,261	5.23
Ramona M.W.D.	46,929	-0-	46,929	5.19
Rincon del Diablo M.W.D. (7)	13,353	-2,689	10,664	1.18
San Diego, City of *	210,442	+44	210,486	23.28
San Dieguito Water District	5,639	-0-	5,639	0.62
San Marcos C.W.D. (15)	28,479	+2	28,481	3.15
In City of San Marcos	(14,092)		(14,137)	(1.56)
Santa Fe Irrigation District	10,175	-0-	10,175	1.13
South Bay Irrigation District (9)	15,478	-0-	15,478	1.71
In City of Chula Vista	(16,214)		(16,235)	(1.80)
Valley Center M.W.D. (11)	62,064	-1,060	61,004	6.75
Yuima M.W.D.	12,813	-0-	12,813	1.42
Total Authority Area	902,702	+1,304	904,006	100.0
San Diego County	2,725,100		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 4,682 acres overlapping in City of San Diego.
 (7) Does not include 16,045 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 718 acres overlapping in National City.

TABLES

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

Population - U.S. Census			Density of Population 1986			
1970 (13)	1980 (13)	Decade Increase 1970-80 Percent	1986 Estimate (14)	Annual Increase 1985-86 Percent	Per Acre	Per Sq. Mile
39,000(1)	51,000	31	61,387	+5.0	3.09	1,981
(24,600)	(35,800)	(46)	(46,748)	(+6.2)	(4.25)	(2,720)
15,500	31,500	103	41,600	+9.5	2.04	1,307
(14,850)	(35,000)	(136)	(48,872)	(+9.7)	(2.04)	(1,303)
3,900	5,040	29	5,097	-1.3	4.40	2,815
150	225	50	265	+1.9	0.02	14
36,000	64,100	78	78,918	+3.6	3.72	2,384
12,000	18,700	56	20,800	+2.5	1.29	823
163,000	203,500	25	215,983	+1.9	6.91	4,419
(50,900)	(72,100)	(42)	(81,752)	(+1.3)	(9.03)	(5,778)
(38,800)	(45,900)	(18)	(51,785)	(-0.7)	(8.99)	(5,752)
-	(20,400)	(-)	(21,789)	(-1.9)	(8.96)	(5,736)
39,000	47,200	21	50,500	+3.1	9.14	5,851
40,700	77,800	91	97,155	+5.9	3.78	2,420
2,000	23,000	1,050	35,300	+11.0	1.29	829
19,400	51,600	166	68,000	+7.9	1.08	692
46,000	89,000	93	91,532	-11.9	1.68	1,075
-	-	-	(50,000)	(+1.0)	(4.46)	(2,857)
-	33,150	-	45,000	-0-	0.33	214
14,000	*33,620	140	38,180	+3.6	1.67	1,071
4,200	7,800	86	9,176	+2.0	0.19	124
6,800	16,000	135	25,000	+31.6	0.53	341
18,900	13,800	-27	20,562	+9.8	1.93	1,235
675,800	849,600	26	1,009,500	+3.1	4.80	3,069
21,800	30,900	42	28,500	-1.9	5.05	3,235
-	24,200	-	29,971	+5.3	1.05	673
(3,900)	(16,500)	(323)	(20,902)	(+5.5)	(1.48)	(946)
8,600	14,700	71	15,746	-3.3	1.55	990
80,000	99,200	24	103,600	+1.1	6.69	4,284
(64,500)	(82,200)	(27)	(116,324)	(+28.8)	(7.17)	(4,586)
7,000	*10,200	46	11,908	+3.0	0.20	125
1,250	1,820	46	1,820	-0-	0.14	91
1,255,000	*1,797,655	43	2,105,500	+2.9	2.33	1,491
1,310,800	1,808,200	38	2,166,169	+4.0	0.79	509

- (10) Does not include 701 acres overlapping in City of Oceanside.
 (11) Does not include 1,159 acres overlapping in City of Escondido.
 (12) Includes 1,159 acres overlapping in Valley Center M.W.D., 370 acres overlapping in San Marcos County W.D., 37 acres overlapping Bueno Colorado M.W.D. and 16,045 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 370 acres overlapping in City of Escondido.

*Corrected figures per agencies.

Table 4
 WATER PRODUCTION, AGRICULTURAL USE AND AUTHORITY STORAGE
 FISCAL YEAR 1985-86
 (Compilation of data furnished by member agencies)

Member Agencies	SOURCE OF WATER (4)				Total Water Production Ac. Ft.	Gross Area (2) Acres	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	
	Local Supply		Authority Supply									From Local Sup	
	Amount Ac. Ft.	Percent	Amount Ac. Ft.	Percent								Ac. Ft.	Perce
Bueno Colorado M.W.D.	13,110.3	74.6	4,473.2	25.4	17,583.5	19,836	16,309	82.2	1.08	61,387	0.29	2,228.0	75
Costa Real M.W.D.	-0-	-0-	13,685.9	100.0	13,685.9	20,369	17,540	86.1	0.78	41,600	0.33	-0-	-0-
Del Mar, City of	-0-	-0-	1,107.2	100.0	1,107.2	1,159	1,082	93.4	1.02	5,097	0.22	-0-	-0-
De Luz Heights M.W.D.	-0-	-0-	2,586.3	100.0	2,586.3	11,789	2,740	23.2	0.94	265	9.76	-0-	-0-
Escondido, City of	9,924.4	41.9	13,787.9	58.1	23,712.3	21,192	19,480	91.9	1.22	78,918	0.30	3,049.6	46
Fallbrook P.U.D.	-0-	-0-	12,270.3	100.0	12,270.3	16,174	11,012	68.1	1.11	20,800	0.59	-0-	-0-
Helix W.D.	3,698.8	8.8	38,357.6	91.2	42,056.4	31,278	30,159	96.4	1.39	215,983	0.19	71.2	10
National City, City of	2,353.2	32.6	4,874.8	67.4	7,228.0	5,524	5,027	91.0	1.44	50,500	0.14	1.6	100
Oceanside, City of	-0-	-0-	24,189.5	100.0	24,189.5	25,694	16,712	65.0	1.45	97,155	0.25	-0-	-0-
Olivenhain M.W.D.	-0-	-0-	9,489.9	100.0	9,489.9	27,266	14,500	53.2	0.65	35,300	0.27	-0-	-0-
Otay W.D.	-0-	-0-	15,125.5	100.0	15,125.5	62,858	32,575	51.8	0.46	68,000	0.22	-0-	-0-
Padre Dam M.W.D.	-0-	-0-	17,965.7	100.0	17,965.7	54,503	35,156	64.5	0.51	91,532	0.20	-0-	-0-
Pendleton Military Res (3)	N.R.	-	(5) 94.9	-	N.R.	134,625	N.A.	-	-	45,000	-	-	-
Poway, City of	323.5	3.2	9,737.0	96.8	10,060.5	22,809	7,755	34.0	1.30	38,180	0.26	27.2	2
Rainbow M.W.D.	-0-	-0-	29,887.4	100.0	29,887.4	47,261	17,551	37.1	1.70	9,176	3.26	-0-	-0-
Ramona M.W.D.	583.7	5.7	9,723.0	94.3	10,306.7	46,929	11,215	23.9	0.92	25,000	0.41	362.2	5
Rincon Del Diablo M.W.D.	-0-	-0-	6,382.5	100.0	6,382.5	10,664	7,858	73.7	0.81	20,562	0.31	-0-	-0-
San Diego, City of (1)	49,963.5	22.0	177,520.9	78.0	227,484.4	210,486	108,743	51.7	2.09	1,009,500	0.23	-0-	-0-
San Dieguito W.D.	4,681.3	59.2	3,222.6	40.8	7,903.9	5,639	5,410	95.9	1.46	28,500	0.28	1,120.9	58
San Marcos C.W.D.	-0-	-0-	10,931.6	100.0	10,931.6	28,481	21,100	74.1	0.52	29,971	0.36	-0-	-0-
Santa Fe I.D.	6,406.4	57.8	4,668.0	42.2	11,074.4	10,175	10,175	100.0	1.09	15,746	0.70	591.7	58
South Bay I.D.	3,658.9	18.6	15,967.4	81.4	19,626.3	15,478	11,517	74.4	1.70	103,600	0.19	9.7	25
Valley Center M.W.D.	252.5	0.6	41,166.9	99.4	41,419.4	61,004	29,460	48.3	1.41	11,908	3.48	202.0	0
Yuima M.W.D.	1,605.2	45.6	1,917.9	54.4	3,523.1	12,813	4,000	31.2	0.88	1,820	1.94	1,548.5	45
Total and Average	96,561.7	17.1	469,039.0	82.9	565,600.7	904,006	437,076	56.8	1.29	2,105,500	0.27	9,212.6	8

- (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; N.R.—Not Reported

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						MEMBER AGENCIES' POOLED STORAGE IN SAN VICENTE RESERVOIR						
					From Local Supply		From Authority		Total Ac. Ft.	Percent of Agricultural Water to Total Production	Total Quantity in Storage 6/30/85 Ac. Ft.	Placed into Storage During Fiscal Year Ac. Ft.	STORED WATER WITHDRAWN DURING FISCAL YEAR			Total Quantity in Storage 6/30/86 Ac. Ft.	
					Ac. Ft.	Percent	Ac. Ft.	Percent					By Delivery Ac. Ft.	By Evaporation Ac. Ft.	By Spill Ac. Ft.		
16,309	82.2	1.08	61,387	0.29	2,228.0	75.3	730.1	24.7	2,958.1	16.8	-0-	-0-	-0-	-0-	-0-	-0-	
17,540	86.1	0.78	41,600	0.33	-0-	-0-	2,488.9	100.0	2,488.9	18.2	1,503.0	285.6	-0-	110.3	-0-	1,678.3	
1,082	93.4	1.02	5,097	0.22	-0-	-0-	0-	0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	
2,740	23.2	0.94	265	9.76	-0-	-0-	2,520.8	100.0	2,520.8	97.5	-0-	-0-	-0-	-0-	-0-	-0-	
19,480	91.9	1.22	78,918	0.30	3,049.6	46.3	3,539.9	53.7	6,589.5	27.8	-0-	-0-	-0-	-0-	-0-	-0-	
11,012	68.1	1.11	20,800	0.59	0-	0-	7,234.9	100.0	7,234.9	59.0	1,503.0	285.6	-0-	110.3	-0-	1,678.3	
30,159	96.4	1.39	215,983	0.19	71.2	10.9	584.1	89.1	655.3	1.6	-0-	-0-	-0-	-0-	-0-	-0-	
5,027	91.0	1.44	50,500	0.14	1.6	100.0	0-	0-	1.6	0.0	-0-	-0-	-0-	-0-	-0-	-0-	
16,712	65.0	1.45	97,155	0.25	-0-	-0-	3,989.7	100.0	3,989.7	16.5	3,006.1	571.1	-0-	220.6	-0-	3,356.6	
14,500	53.2	0.65	35,300	0.27	-0-	-0-	1,514.8	100.0	1,514.8	16.0	500.9	95.2	-0-	36.7	-0-	559.4	
32,575	51.8	0.46	68,000	0.22	-0-	-0-	1,347.1	100.0	1,347.1	8.9	1,503.0	285.6	-0-	110.3	-0-	1,678.3	
35,156	64.5	0.51	91,532	0.20	-0-	-0-	1,305.2	100.0	1,305.2	7.3	2,003.9	380.8	-0-	147.0	-0-	2,237.7	
N.A.	-	-	45,000	-	-	-	-	-	-	-	-	-	-	-	-	-	
7,755	34.0	1.30	38,180	0.26	27.2	2.2	1,194.8	97.8	1,222.0	12.1	-0-	-0-	-0-	-0-	-0-	-0-	
17,551	37.1	1.70	9,176	3.26	-0-	-0-	24,968.0	100.0	24,968.0	83.5	500.9	95.2	-0-	36.7	-0-	559.4	
11,215	23.9	0.92	25,000	0.41	362.2	5.9	5,789.1	94.1	6,151.3	59.7	2,003.9	380.8	-0-	147.0	-0-	2,237.7	
7,858	73.7	0.81	20,562	0.31	-0-	-0-	1,166.8	100.0	1,166.8	18.3	601.3	114.2	-0-	44.2	-0-	671.3	
108,743	51.7	2.09	1,009,500	0.23	-0-	-0-	1,809.3	100.0	1,809.3	0.8	-0-	-0-	-0-	-0-	-0-	-0-	
5,410	95.9	1.46	28,500	0.28	1,120.9	58.6	792.8	41.4	1,913.7	24.2	-0-	-0-	-0-	-0-	-0-	-0-	
21,100	74.1	0.52	29,971	0.36	-0-	-0-	3,227.3	100.0	3,227.3	29.5	500.9	95.2	-0-	36.7	-0-	559.4	
10,175	100.0	1.09	15,746	0.70	591.7	58.7	416.0	41.3	1,007.7	9.1	-0-	-0-	-0-	-0-	-0-	-0-	
11,517	74.4	1.70	103,600	0.19	9.7	25.5	28.4	74.5	38.1	0.2	-0-	-0-	-0-	-0-	-0-	-0-	
29,460	48.3	1.41	11,908	3.48	202.0	0.6	36,327.9	99.4	36,529.9	88.2	500.9	95.2	-0-	36.7	-0-	559.4	
4,000	31.2	0.88	1,820	1.94	1,548.5	45.4	1,860.7	54.6	3,409.2	96.8	100.2	19.0	-0-	7.3	-0-	111.9	
437,076	56.8	1.29	2,105,500	0.27	9,212.6	8.2	102,836.6	91.8	112,049.2	19.8	14,228.0	2,703.5	-0-	1,043.8	-0-	15,887.7	

Table 5
 ASSESSED VALUATION AND TAX COLLECTIONS
 FISCAL YEAR 1985-86

Member Agencies	ASSESSED VALUATION - SECURED AND UNSECURED				Area 6/30/86 Acres	1985-86 Valuation Per Acre	Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/85	Tax Collections	Interest & Penalties
	*1984-85 Total	*1985-86 Total	1984-85 to 1985-86 Percent Change	*1986-87 Total							
Bueno Colorado M.W.D.	\$ 2,091,236,875	\$ 2,392,025,940	+14.4	\$ 2,787,271,024	19,836	\$120,590	\$ 3,187,713.84	\$ 201,804.70	\$ 128,047.80	\$ 3,261,470.74	\$ 23,396.85
Costa Real M.W.D.	2,161,100,052	2,472,996,108	+14.4	2,928,817,724	20,369	121,410	3,263,411.81	108,250.43	46,142.87	3,325,519.37	23,471.21
Del Mar, City of	308,371,620	342,406,102	+11.0	370,575,006	1,159	295,432	672,499.12	32,408.73	9,155.08	695,752.77	5,174.44
De Luz Heights M.W.D.	46,566,950	48,332,262	+ 3.8	50,071,254	11,789	4,100	72,461.40	2,527.11	2,746.81	72,241.70	706.51
Escondido, City of	1,492,068,191	1,683,336,753	+12.8	1,956,578,606	21,160	79,553	2,724,761.43	131,181.19	67,279.80	2,788,662.82	14,628.00
Fallbrook P.U.D.	589,251,066	646,182,369	+ 9.7	707,671,331	16,174	39,952	1,086,024.61	57,601.55	28,741.08	1,114,885.08	6,135.77
Helix W.D.	5,203,170,801	5,591,798,578	+ 7.5	6,048,402,835	31,278	178,777	11,546,714.13	454,976.28	217,726.03	11,783,964.38	45,194.65
National City, City of	718,607,895	746,541,158	+ 3.9	789,058,820	5,524	135,145	1,889,349.61	64,885.45	15,732.67	1,938,502.39	5,715.58
Oceanside, City of	2,150,695,223	2,372,482,193	+10.3	2,659,068,957	25,694	92,336	3,430,953.01	177,443.16	127,719.61	3,480,676.56	17,609.29
Olivenhain M.W.D.	1,372,208,259	1,680,643,767	+22.5	2,003,261,107	27,266	61,639	1,534,523.86	117,575.35	117,905.00	1,534,194.21	12,819.03
Otay W.D.	1,757,423,453	2,049,808,010	+16.6	2,391,288,987	62,858	32,610	2,504,713.09	156,074.21	127,794.13	2,532,993.17	15,331.94
Padre Dam M.W.D.	2,103,810,155	2,334,777,302	+11.0	2,606,259,901	54,503	42,838	3,343,563.08	169,292.05	129,875.50	3,382,979.63	24,731.89
Pendleton Military Res.	2,610,324,315	2,860,158,917	+ 9.6	3,410,610,730	134,625	21,245	1,891,944.04	76,335.24	478,328.79	1,489,950.49	-0-
Poway, City of	1,127,422,148	1,241,272,805	+10.1	1,387,724,029	22,809	54,420	1,660,863.53	95,158.88	73,961.34	1,682,061.07	14,740.91
Rainbow M.W.D.	679,897,834	729,576,499	+ 7.3	801,355,346	47,261	15,437	1,178,200.46	35,215.64	8,351.85	1,205,064.25	14,466.76
Ramona M.W.D.	641,771,837	701,088,562	+ 9.2	772,833,531	46,929	14,939	1,007,056.27	72,976.19	(26,976.91)	1,107,009.37	9,716.58
Rincon Del Diablo M.W.D.	1,126,250,503	1,244,456,758	+10.5	1,420,181,493	10,696	116,348	1,789,037.92	171,531.92	156,809.36	1,803,760.48	11,825.92
San Diego, City of	30,482,428,659	34,364,573,939	+12.7	38,899,063,923	210,486	163,263	61,071,047.08	(44,322,087.94)	(1,711,464.43)	18,460,423.57	46,334.54
San Dieguito W.D.	1,035,324,539	1,165,475,356	+12.6	1,294,764,141	5,639	206,681	1,800,250.41	103,004.28	53,943.94	1,849,310.75	8,222.28
San Marcos C.W.D.	1,159,884,259	1,299,442,913	+12.0	1,453,812,585	28,481	45,625	1,680,176.49	97,057.87	31,990.16	1,745,244.20	5,736.93
Santa Fe I.D.	1,409,934,625	1,615,595,568	+14.6	1,803,819,133	10,175	158,781	2,111,745.91	161,511.57	56,911.98	2,216,345.50	10,442.10
South Bay I.D.	2,703,736,889	2,907,316,021	+ 7.5	3,129,097,013	15,478	187,835	6,178,039.08	(405,883.07)	(118,900.37)	5,891,056.38	16,305.66
Valley Center M.W.D.	754,119,401	787,433,532	+ 4.4	845,871,899	61,004	12,908	1,187,333.23	69,136.03	59,243.28	1,197,225.98	12,234.20
Yuima M.W.D.	106,219,951	110,421,904	+ 4.0	115,903,598	12,813	8,618	253,809.00	9,593.27	5,168.19	258,234.08	1,197.52
Total Authority	\$63,831,825,500	\$71,388,143,316	+11.8	\$80,633,362,973	904,006	\$ 78,969	\$117,066,192.41	\$(42,162,429.91)	\$ 86,233.56	\$74,817,528.94	\$346,138.56
San Diego County (1)	\$66,347,388,592	\$74,138,289,435	+11.7	\$85,143,527,702	1,250,000	\$ 59,311					

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

*Market value as determined by County Assessor.

Member Agencies	ASSESSED VALUATION		Interest & Penalties	Receipts in Lieu of Taxes	Misc. Tax Sales	Net Total Collections	Amount Paid for Service Connections to 6/30/86	Total Amount Paid by Each Member Agency to 6/30/86
	*1984-85 Total	*1985-86 Total						
Bueno Colorado M.W.D.	\$ 2,091,236,875	\$ 2,392,020.74	\$ 23,396.85	\$ 10,802.62	\$ 123.67	\$ 3,295,793.88	\$ 207,438	\$ 3,503,232
Costa Real M.W.D.	2,161,100,052	2,472,990.37	23,471.21	33,275.49	10.70	3,382,276.82	7,931	3,390,208
Del Mar, City of	308,371,620	342,402.77	5,174.44	530.63	1.05	701,458.89	-	701,459
De Luz Heights M.W.D.	46,566,950	48,331.70	706.51	1,000.00	-0-	73,948.21	-	73,948
Escondido, City of	1,492,068,191	1,683,332.82	14,628.00	28.80	28.84	2,803,348.46	9,253	2,812,601
Fallbrook P.U.D.	589,251,066	646,185.08	6,135.77	3,420.09	43.10	1,124,484.04	67,773	1,192,257
Helix W.D.	5,203,170,801	5,591,794.38	45,194.65	4,930.57	783.52	11,834,873.12	28,905	11,863,778
National City, City of	718,607,895	746,542.39	5,715.58	6,828.33	96.07	1,951,142.37	-	1,951,142
Oceanside, City of	2,150,695,223	2,372,486.56	17,609.29	2,601.17	100.46	3,500,987.48	126,369	3,627,356
Olivenhain M.W.D.	1,372,208,259	1,680,644.21	12,819.03	1,250.00	-0-	1,548,308.68	66,608	1,614,917
Otay W.D.	1,757,423,453	2,049,803.17	15,331.94	4,455.25	45.44	2,552,780.36	208,573	2,761,353
Padre Dam M.W.D.	2,103,810,155	2,334,779.63	24,731.89	3,003.17	131.84	3,410,846.48	45,244	3,456,090
Pendleton Military Res.	2,610,324,315	2,860,150.49	0	-0-	-0-	1,489,950.49	-	1,489,950
Poway, City of	1,127,422,148	1,241,271.07	14,740.91	15.02	8.94	1,696,825.94	103,875	1,800,701
Rainbow M.W.D.	679,897,834	729,574.25	14,466.76	23,679.97	0.72	1,243,211.70	193,484	1,436,696
Ramona M.W.D.	641,771,837	701,089.37	9,716.58	5,400.02	58.79	1,122,184.76	3,378	1,125,563
Rincon Del Diablo M.W.D.	1,126,250,503	1,244,450.48	11,825.92	58,800.96	1.36	1,874,388.72	14,527	1,888,916
San Diego, City of	30,482,428,659	34,364,573.57	46,334.54	44,982,332.59	2,466.94	63,491,557.64	426,982	63,918,540
San Dieguito W.D.	1,035,324,539	1,165,470.75	8,222.28	5,426.06	131.25	1,863,090.34	47,205	1,910,295
San Marcos C.W.D.	1,159,884,259	1,299,444.20	5,736.93	-0-	-0-	1,750,981.13	-	1,750,981
Santa Fe I.D.	1,409,934,625	1,615,595.50	10,442.10	2,892.80	1,914.29	2,231,594.69	58,787	2,290,382
South Bay I.D.	2,703,736,889	2,907,316.38	16,305.66	629,977.08	143.26	6,537,482.38	-	6,537,482
Valley Center M.W.D.	754,119,401	787,435.98	12,234.20	1,011.39	26.31	1,210,497.88	162,554	1,373,052
Yuima M.W.D.	106,219,951	110,424.08	1,197.52	1,500.00	-0-	260,931.60	28,424	289,356
Total Authority	\$63,831,825,500	\$71,388,148.94	\$346,138.56	\$45,783,162.01	\$6,116.55	\$120,952,946.06	\$1,807,310	\$122,760,256
San Diego County (1)	\$66,347,388,592	\$74,138,281						

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

*Market value as determined by County Assessor.

SAN DIEGO COUNTY WATER AUTHORITY

Table 6
WATER PRODUCTION WITHIN AUTHORITY AGENCIES—FISCAL YEARS 1976-77 to 1985-86
(All Figures in Acre Feet)

Member Agencies	From Local and Authority Supplies									
	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86
Buena Colorado M.W.D.	13,928	13,263	14,554	15,038	17,565	15,446	14,720	18,351	16,988	17,584
Costa Real M.W.D.	10,752	10,010	11,135	12,554	13,385	12,749	11,879	12,895	12,880	13,686
Del Mar, City of	918	921	1,096	999	1,075	1,045	1,055	1,235	1,097	1,107
De Luz Heights M.W.D.	503	612	900	1,339	1,757	1,794	1,792	2,531	2,373	2,586
Escondido, City of	19,740	19,001	20,500	22,113	26,052	22,534	20,269	24,214	23,281	23,712
Fallbrook Public Utility Dist.	12,999	11,128	11,667	12,174	14,698	12,386	10,156	12,600	11,606	12,270
Helix Water District	34,465	32,882	36,256	37,676	41,613	39,284	36,519	41,081	40,579	42,056
National City & South Bay I.D.	21,339	20,021	21,628	21,519	23,222	23,209	23,252	25,493	26,092	26,854
Oceanside, City of	16,565	15,851	18,310	19,602	22,408	21,769	19,846	22,583	24,114	24,190
Olivethain M.W.D.	3,739	4,358	4,714	5,313	6,437	5,856	6,027	7,741	8,233	9,490
Olney W.D.	11,787	11,846	11,270	11,852	13,612	12,943	11,952	13,551	13,830	15,126
Padre Durr M.W.D.	11,623	11,799	12,812	13,718	15,572	14,908	14,102	16,992	17,027	17,966
Pendleton Military Res.	-	-	-	-	-	-	-	-	-	-
Poway, City of	7,177	6,553	6,948	8,240	9,027	7,873	7,447	9,215	9,320	10,061
Rainbow M.W.D.	25,824	22,529	24,709	26,943	34,111	28,630	25,354	31,374	29,207	29,887
Ramona M.W.D.	5,653	5,531	6,269	6,583	9,065	8,873	8,679	10,871	9,609	10,307
Rincon del Diablo M.W.D.	3,914	3,926	4,483	4,789	5,763	5,256	4,374	6,001	6,039	6,383
San Diego, City of:										
Inside City	162,003	155,226	164,934	175,668	191,713	192,626	182,873	203,642	216,289	221,873
Outside City (not in Authority)	7,267	6,023	6,866	4,480	6,964	5,657	3,723	6,149	4,492	5,611
San Diegoito Water District	7,058	6,452	7,170	7,342	8,056	7,668	7,298	7,670	7,956	7,904
San Marcos C.W.D.	5,535	5,562	6,559	6,800	8,420	8,233	7,847	9,654	10,090	10,932
Santa Fe Irrigation District	7,517	7,254	7,735	10,252	9,368	8,792	7,728	10,617	11,195	11,074
Valley Center M.W.D.	28,895	26,738	29,417	33,568	44,687	38,358	32,583	42,367	39,435	41,419
Yuima M.W.D.	3,729	3,335	2,987	2,978	3,891	3,498	2,782	3,335	3,392	3,523
Total	423,030	400,821	433,009	461,540	528,461	499,387	462,357	540,262	545,214	565,601

TABLES

Table 7
WATER SALES—1947 to 1986
(All figures rounded to nearest whole acre foot)

Member Agencies	(1) 1947-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	Total
Buena Colorado M.W.D.	156,883	4,657	7,402	6,594	9,652	2,753	3,463	5,827	4,473	201,704
Costa Real M.W.D.	156,687	11,162	12,235	13,308	12,749	11,879	12,895	12,839	13,677	257,609
Del Mar, City of	10,675	1,095	1,283	1,076	1,045	1,055	1,235	1,097	1,107	19,666
De Luz Heights M.W.D.	1,735	820	1,097	1,527	1,794	1,792	2,531	2,354	2,586	16,334
Escondido, City of	150,574	6,837	8,749	12,880	15,969	8,342	14,024	14,082	14,284	246,341
Fallbrook Public Utility District	264,371	11,604	12,174	14,698	12,363	10,168	12,600	11,600	12,322	361,900
Helix Water District	615,479	19,198	19,800	24,413	29,577	22,898	24,779	36,507	37,972	830,623
National City & South Bay I.D.	357,950	4,174	3,093	143	315	132	87	4,863	20,817	391,574
Oceanside, City of	205,849	17,941	19,326	22,362	21,226	19,821	22,583	24,114	24,190	377,912
Olivethain M.W.D.	32,319	5,154	5,313	6,433	5,739	5,714	7,860	8,233	9,485	86,250
Olney W.D.	151,516	11,270	11,782	12,943	11,952	13,542	13,830	15,125	255,589	
Padre Dam M.W.D.	132,509	12,812	13,721	15,572	14,908	14,102	16,992	17,027	17,966	255,609
Pendleton Military Res.	-	-	293	617	715	1,356	1,694	1,542	95	6,312
Poway, City of	93,190	6,942	7,052	9,269	8,351	6,841	9,005	9,313	9,821	159,784
Rainbow M.W.D.	317,510	24,770	27,040	33,940	28,630	25,426	31,374	29,160	29,211	547,061
Ramona M.W.D.	40,559	6,122	6,239	8,258	8,541	8,092	10,392	8,688	9,723	106,614
Rincon del Diablo M.W.D.	125,011	4,483	4,789	5,763	5,256	4,374	6,001	6,039	6,383	168,099
San Diego, City of	2,910,704	94,280	92,986	119,890	157,743	90,841	114,473	170,344	183,903	3,933,254
San Diegoito Water District	75,773	4,056	5,732	5,711	4,573	4,009	4,520	3,791	3,227	110,892
San Marcos C.W.D.	61,295	6,585	6,855	8,465	8,154	7,847	9,654	10,135	10,941	129,931
Santa Fe Irrigation District	82,440	4,634	6,258	6,630	5,278	4,426	5,895	4,488	4,668	124,717
Valley Center M.W.D.	251,534	28,837	32,681	44,046	38,091	32,583	42,247	38,953	41,055	550,027
Yuima M.W.D.	29,027	1,829	1,601	2,054	2,505	1,403	1,333	1,885	1,924	43,261
Total Sales to Agencies	6,223,676	289,262	307,489	377,378	404,317	297,806	369,779	436,201	474,955	9,180,863
Total Sales to Others	51,301	1,990	2,560	658	-	-	-	-	-	56,509
Total to Authority Storage	+330,181	+2,000	+2,000	-	+14,560	+9,100	+452	+645	+13,158	+372,096
Total to Metropolitan Storage	-292,298	-4,533	-2,000	-2,000	-	-7,383	-	-	-	-308,214
Total from Metropolitan Storage	+120,929	-	-	-	-	-	-	-	+230	+121,159
Total from Metropolitan Storage	-116,908	-	-	-	-	-	-	-	-219	-117,127
Total Flow in Authority System	6,316,881	288,719	310,049	376,036	418,877	299,523	370,231	436,846	488,124	9,305,286
Average Rate of Flow (c.f.a.)										
To Agencies and Others	402.3	427.1	522.2	558.5	411.3	509.4	602.5	656.0		
To Authority Storage	+2.6	+2.8	-	+20.1	+12.6	+0.6	+0.9	+18.2		
From Authority Storage	-6.3	-2.8	-2.8	-	-10.2	-	-	-		
To Metropolitan Storage	-	-	-	-	-	-	-	+0.3		
From Metropolitan Storage	-	-	-	-	-	-	-	-0.3		
Flow in Authority System	398.8	427.1	519.4	578.6	413.7	510.0	603.4	674.2		

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

SAN DIEGO COUNTY WATER AUTHORITY

Table 8
SALES OF IMPORTED WATER FISCAL YEAR 1985-86
(All Figures in Acre-Feet except as noted)

Member Agency	Month, 1985						Total 6 Months 1985
	July	August	Sept.	Oct.	Nov.	Dec.	
Bueno Colorado M.W.D.	968.2	586.9	194.3	471.6	228.6	30.7	2,480.3
Costa Real M.W.D.	1,522.0	1,631.4	1,449.4	1,370.2	864.4	612.1	7,449.5
Del Mar, City of	153.7	123.3	101.5	93.9	77.9	62.3	612.6
De Luz Heights M.W.D.	394.9	388.2	309.5	274.4	100.6	63.7	1,531.3
Escondido, City of	2,083.6	2,122.5	1,610.3	944.6	461.5	217.6	7,440.1
Fallbrook P.U.D.	1,739.3	1,815.7	1,760.6	1,744.5	812.7	407.3	8,280.1
Helix W.D.	3927.1	3,686.1	3,243.2	3,096.4	3,189.5	2,980.9	20,123.2
National City & South Bay I.D.	1,795.2	1,845.0	1,774.8	2,125.6	1,732.2	1,373.9	10,646.7
Oceanside, City of	2,838.1	2,782.5	2,346.8	2,257.8	1,511.4	1,208.4	12,945.0
Olivenhain M.W.D.	1,203.3	1,180.3	1,016.1	935.4	562.5	419.9	5,317.5
Otay W.D.	1,811.1	1,829.4	1,553.6	1,359.0	879.4	703.5	8,136.0
Padre Dam M.W.D.	2,341.6	2,219.3	1,756.1	1,553.4	1,053.8	859.7	9,783.9
Pendleton Military Res.*	11.5	10.2	8.3	8.8	9.1	7.1	55.0
Poway, City of	775.2	1,167.4	1,580.6	855.5	534.4	431.2	5,344.3
Rainbow M.W.D.	4,628.8	4,214.6	3,419.7	3,354.9	1,249.5	485.6	17,353.1
Ramona M.W.D.	1,457.4	1,410.2	1,094.0	966.4	520.1	312.9	5,761.0
Rincon Del Diablo M.W.D.	860.1	836.3	633.0	594.0	346.6	250.8	3,520.8
San Diego, City of	18,557.7	19,013.6	17,637.2	16,234.4	11,938.9	11,211.3	94,593.1
San Dieguito W.D.	697.8	516.4	447.2	245.7	100.4	13.3	2,020.8
San Marcos C.W.D.	1,393.6	1,334.4	1,080.8	1,068.7	623.2	486.5	5,987.2
Santa Fe I.D.	1,000.7	790.4	667.8	359.5	106.5	1.1	2,926.0
Valley Center M.W.D.	6,433.5	6,287.9	4,800.6	4,404.2	1,628.4	849.8	24,404.4
Yuima M.W.D.	349.2	365.1	270.4	228.7	68.7	22.5	1,304.6
Total Sales to Agencies	56,943.6	56,157.1	48,755.8	44,547.6	28,600.3	23,012.1	258,016.5
Total Sales to Others	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Total Sales to Agencies & Others	56,943.6	56,157.1	48,755.8	44,547.6	28,600.3	23,012.1	258,016.5
Total to Authority Storage	+2,703.5	-0-	-0-	-0-	-0-	-0-	+2,703.5
Total From Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Total Flow in Authority System	59,647.1	56,157.1	48,755.8	44,547.6	28,600.3	23,012.1	260,720.0
Total Evaporation Losses from Storage in San Vicente and Lower Otay Reservoirs	136.1	155.4	107.7	91.8	57.8	28.8	577.6
Total Evaporation Losses from Storage in Sweetwater Reservoir	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Rate of Flow (c.f.s.)							
To Agencies and Others	926.1	913.3	819.4	724.5	480.6	374.3	707.0
To Authority Storage	+44.0	-0-	-0-	-0-	-0-	-0-	+7.4
From Authority Storage	-0-	-0-	-0-	-0-	-0-	-0-	-0-
In Authority System	970.1	913.3	819.4	724.5	480.6	374.3	714.4

*1,330.2 AF delivered through Coastal M.W.D. facilities are not included in Authority totals.

TABLES

Table 8
(Continued)

Member Agency	Month, 1986						Total 6 Months 1986	Fiscal Year Total	Fiscal Year Average cfs
	Jan.	Feb.	March	April	May	June			
Bueno Colorado M.W.D.	908.6	427.5	5.5	206.5	254.7	190.1	1,992.9	4,473.2	6.2
Costa Real M.W.D.	856.0	613.1	740.7	1,107.2	1,482.9	1,427.4	6,227.3	13,676.8	18.9
Del Mar, City of	77.5	61.4	72.4	78.0	87.9	117.4	494.6	1,107.2	1.5
De Luz Heights M.W.D.	168.5	24.3	59.6	175.8	293.7	333.1	1,055.0	2,586.3	3.6
Escondido, City of	1,410.1	649.5	614.1	1,035.5	1,475.3	1,659.3	6,843.8	14,283.9	19.7
Fallbrook P.U.D.	849.4	236.1	379.5	226.5	973.6	1,376.8	4,041.9	12,322.0	17.0
Helix W.D.	2,983.0	2,385.3	2,619.3	2,901.1	3,485.3	3,475.2	17,849.2	37,972.4	52.5
National City & South Bay I.D.	1,672.7	1,324.9	1,572.6	1,796.8	1,660.9	2,142.6	10,170.5	20,817.2	28.8
Oceanside, City of	1,585.3	1,025.3	1,311.5	1,971.6	2,680.0	2,670.8	11,244.5	24,189.5	33.4
Olivenhain M.W.D.	601.6	349.6	461.0	666.8	1,054.8	1,033.8	4,167.6	9,485.1	13.1
Otay W.D.	940.1	641.0	816.4	1,201.1	1,600.7	1,790.2	6,989.5	15,125.5	20.9
Padre Dam M.W.D.	1,114.1	790.7	918.5	1,324.7	1,933.3	2,100.5	8,181.8	17,965.7	24.8
Pendleton Military Res.*	7.3	5.8	7.1	4.5	6.4	8.8	39.9	94.9	-0.1
Poway, City of	620.3	254.3	346.9	906.1	1,107.1	1,242.1	4,476.8	9,821.1	13.6
Rainbow M.W.D.	1,589.1	469.3	980.8	1,841.0	3,704.5	3,273.6	11,858.3	29,211.4	40.3
Ramona M.W.D.	618.3	173.0	341.6	629.0	1,040.3	1,159.8	3,962.0	9,723.0	13.4
Rincon Del Diablo M.W.D.	395.3	231.6	295.0	460.2	705.4	774.2	2,861.7	6,382.5	8.8
San Diego, City of	13,026.0	8,048.5	12,870.6	15,789.5	20,426.5	19,148.3	89,309.4	183,902.5	251.0
San Dieguito W.D.	87.3	22.2	-0-	167.3	358.8	571.0	1,206.6	3,227.4	4.5
San Marcos C.W.D.	740.5	417.1	544.8	835.7	1,198.7	1,216.6	4,953.4	10,940.6	15.1
Santa Fe I.D.	115.2	15.0	7.3	193.5	519.0	892.0	1,742.0	4,668.0	6.4
Valley Center M.W.D.	2,719.2	359.3	1,139.6	2,489.4	4,799.4	5,143.3	16,650.2	41,054.6	56.7
Yuima M.W.D.	57.4	5.2	25.8	103.4	193.0	235.0	619.8	1,924.4	2.7
Total Sales to Agencies	33,142.8	18,530.0	26,130.6	36,111.2	51,042.2	51,981.9	216,938.7	474,955.2	656.0
Total Sales to Others	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
Total Sales to Agencies & Others	33,142.8	18,530.0	26,130.6	36,111.2	51,042.2	51,981.9	216,938.7	474,955.2	656.0
Total to Authority Storage	-0-	+434.6	+5,644.2	+4,605.2	-0-	-0-	+10,684.0	+13,387.5	
Total From Authority Storage	-0-	-0-	-0-	-0-	-0-	-219.1	-219.1	-219.1	
Total Flow in Authority System	33,142.8	18,964.6	31,774.8	40,716.4	51,042.2	51,762.8	227,403.6	488,123.6	
Total Evaporation Losses from Storage in San Vicente and Lower Otay Reservoirs	38.6	40.3	62.4	84.3	115.8	124.8	466.2	1,043.8	
Total Evaporation Losses from Storage in Sweetwater Reservoir	-0-	-0-	-0-	1.9	4.8	3.9	10.6	10.6	
Rate of Flow (c.f.s.)									
To Agencies and Others	539.0	333.7	425.0	606.9	830.1	873.6	604.3	656.0	
To Authority Storage	-0-	+7.8	+91.8	+77.4	-0-	-0-	+29.7	+18.5	
From Authority Storage	-0-	-0-	-0-	-0-	-0-	-3.7	0.6	0.3	
In Authority System	539.0	341.5	516.8	684.3	830.1	869.9	633.4	674.2	

SAN DIEGO COUNTY WATER AUTHORITY

Table 9
ASSESSED VALUATIONS AND TAX RATES
Fiscal Years 1945-46 to 1985-86

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)	29,833,450	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	0.10
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	139,954,740	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	213,194,301	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	393,800,174	4,114,380,482	0.11	0.11
1974-75	4,075,823,685	249,562,970	430,374,627	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)	41,739,646,912	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
1984-85	55,587,979,549	5,666,443,560	2,577,402,391	63,831,825,500	0.007090	0.004605
1985-86	62,444,546,244	6,086,732,100	2,856,824,972	71,388,143,316	0.005310	0.007090

- (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.

TABLES

Table 9
Continued
TAX LEVIES AND TAX COLLECTIONS BY FISCAL YEAR
(Includes in Lieu of Taxes)
Fiscal Years 1945-46 to 1985-86

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	(6,388)	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	4,640,272	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	7,114,293	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
7,239,670	7,039,608	97.24	(72,146)	283,045	7,322,653	49,944	0.69
7,181,483	7,092,760	98.76	106,262	158,696	7,251,456	86,233	1.20

SAN DIEGO COUNTY WATER AUTHORITY

Table 10
 CHEMICAL CHARACTER OF NATURAL COLORADO RIVER WATER
 AT WEST PORTAL OF SAN JACINTO TUNNEL
 Year Ending June 30, 1986
 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 ₃	Alkalinity as mg/l CaCO ₃ Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					°F	°C
July	288	131	25.0	8.42	78.8	26.0
August	283	130	24.5	8.42	77.0	25.0
September	283	130	24.5	8.41	-	-
October	276	130	24.0	8.35	68.9	20.5
November	276	129	24.0	8.32	66.2	19.0
December	276	131	24.5	8.35	57.2	14.0
January	279	132	24.0	8.35	55.4	13.0
February	280	133	25.0	8.33	53.6	12.0
March	268	128	24.5	8.38	60.8	16.0
April	-	-	-	-	-	-
May	264	131	24.0	8.44	69.8	21.0
June	263	132	24.5	8.44	75.2	24.0

ANALYSIS - YEAR ENDING JUNE 30, 1986
 (mg/l except PH, Conductivity and Temperature)

Constituent	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO ₂)	8.6	9.2	8.0
Calcium	(Ca)	70	74	65
Magnesium	(Mg)	24.5	25.0	24.0
Sodium	(Na)	74	78	71
Potassium	(K)	3.6	3.9	3.3
Carbonate	(CO ₃)	2	5	0
Bicarbonate	(HCO ₃)	156	160	151
Sulfate	(SO ₄)	221	234	206
Chloride	(Cl)	57	60	54
Nitrate	(NO ₃)	1.03	1.30	0.80
Fluoride	(F)	0.28	0.32	0.25
Boron	(B)	0.00	0.05	0.00
Total Dissolved Solids		540	562	518
Hardness as CaCO ₃ - Total		275	288	263
Alkalinity - Total		131	133	128
Free Carbon Dioxide	(CO ₂)	1.1	1.3	1.0
Hydrogen Ion Concentration	(PH)	8.38	8.44	8.32
Electrical Conductivity EC x 10 ⁶ @ 25°C		863	891	828
Temperature °C		19.0	26.0	12.0

TABLES

Table 11
 CHEMICAL CHARACTER OF BLENDED TREATED WATER
 AT LAKE SKINNER
 Year Ending June 30, 1986
 Samples Taken by M.W.D. and Analyzed by District Laboratory

Month	Total Hardness as mg/l Ca CO ₃	Alkalinity as mg/l CaCO ₃ Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					°F	°C
July	189	100	17.5	8.09	77.0	25
August	189	99	17.5	8.08	77.0	25
September	185	100	16.5	8.12	75.2	24
October	212	107	19.0	8.08	71.6	22
November	226	114	21.0	8.11	62.6	17
December	252	123	23.0	8.12	53.6	12
January	264	129	24.0	8.14	57.2	14
February	269	129	23.0	8.10	55.4	13
March	264	125	24.0	8.08	60.8	16
April	262	127	24.0	8.09	62.6	17
May	240	121	23.0	8.07	68.0	20
June	199	105	19.0	8.08	71.6	22

ANALYSIS - YEAR ENDING JUNE 30, 1986
 (mg/l except PH, Conductivity and Temperature)

Constituent	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO ₂)	8.6	9.6	7.8
Calcium	(Ca)	57	66	47
Magnesium	(Mg)	21.0	24.0	16.5
Sodium	(Na)	68	75	58
Potassium	(K)	3.3	3.8	2.6
Carbonate	(CO ₃)	0	1	0
Bicarbonate	(HCO ₃)	140	157	121
Sulfate	(SO ₄)	176	216	136
Chloride	(Cl)	59	63	53
Nitrate	(NO ₃)	0.63	1.10	0.10
Fluoride	(F)	0.21	0.35	0.17
Boron	(B)	0.16	0.21	0.11
Total Dissolved Solids		464	531	387
Hardness as CaCO ₃ - Total		229	269	185
Alkalinity - Total		115	129	99
Free Carbon Dioxide	(CO ₂)	1.9	2.1	1.6
Hydrogen Ion Concentration	(PH)	8.10	8.14	8.07
Electrical Conductivity EC x 10 ⁶ @ 25°C		762	850	644
Temperature °C		19.0	25.0	12.0

SAN DIEGO COUNTY WATER AUTHORITY

Table 12
ASSESSED 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	6,548,392,314	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	19,343,157,788	14	14
1966-67	2,901,421	20,979,150,165	14	14
1967-68	3,061,885	22,732,357,500	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	45,693,342,697	12	13
1977-78	3,207,533	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)	01985(3)	01985(3)
1982-83	3,277,011	353,335,259,307	0166%	0198%
1983-84	3,280,294	379,788,761,242	0237%	0166%
1984-85	3,280,954	419,859,047,899	0156%	0237%
1985-86	3,282,745	458,782,059,816	0164%	0156%
1986-87	-	505,419,663,679	0148%	0164%

(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.

TABLES

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

Member Agencies	Date of Annexation	Amount of Annexation Charge	Remaining Balance 6-30-86
Annexation Charges Outstanding			
Del Mar, City of	11-23-62	\$ 611,250	\$ 122,098
De Luz M.W.D.	6-28-67	2,002,000	*3,263,938
No. 1 Annexation of 1969	10-15-69	312,000	*566,205
Fallbrook P.U.D.			
No. 2 Annexation of 1958	11-24-58	50,400	3,254
Fallbrook Community Air Park	12-22-69	59,800	*91,773
Helix Water District			
Helix-Watson Ranch Annexation	2-20-59	8,730	837
Helix-Sunny Slope Hts. Annexation	9-17-59	38,250	3,806
Olivenhain M.W.D.	7-25-60	83,880	11,082
No. 1 Annexation of 1965	2-11-65	512,520	153,663
No. 4 Annexation of 1967	11-13-67	74,000	61,228
Otay W.D.	10-26-56	273,000	-0-
No. 3 Annexation of 1960	10-20-60	95,100	12,587
Padre Dam M.W.D. (not including Lakeside I.D.)			
(Formerly Rio San Diego M.W.D.)	6-7-56	373,980	-0-
No. 2 Annexation of 1959	11-6-59	109,110	10,832
No. 3 Annexation of 1960	10-17-60	289,890	38,540
No. 4 Annexation of 1970	8-3-70	164,000	115,052
Poway M.W.D.			
No. 1 Annexation of 1959	9-21-59	27,150	2,618
Rainbow M.W.D.			
No. 1 Annexation of 1959	5-12-59	24,300	2,408
No. 3 Annexation of 1967	12-6-67	1,728,000	*3,233,768
No. 5 Annexation of 1973	11-22-73	13,200	10,792
Ramona M.W.D.	8-27-57	339,000	11,264
No. 1 Annexation of 1959	5-29-59	42,330	4,220
No. 2 Annexation of 1961	9-22-61	15,480	2,578
No. 3 Annexation of 1963	9-20-63	10,560	2,452
No. 4 Annexation of 1967	11-27-67	480,600	539,138
No. 5 Annexation of 1972	5-17-72	732,000	653,958
Rincon del Diablo M.W.D.			
No. 4 Annexation of 1972	11-2-72	19,200	*25,994
San Dieguito Water District			
No. 1 Annexation of 1959	9-15-59	71,820	7,038
No. 2 Annexation of 1972	12-8-72	107,000	*148,367
Valley Center M.W.D.	5-9-55	205,680	-0-
No. 1 Annexation of 1960	12-12-60	23,700	3,152
No. 2 Annexation of 1967	11-29-67	22,000	27,340
No. 3 Annexation of 1967	11-30-67	502,000	628,169
Yulma M.W.D.	12-16-63	749,490	174,870
No. 1 Annexation of 1967	11-21-67	72,200	48,087
No. 2 Annexation of 1969	11-24-69	14,400	13,019
Pendleton Mil. Reservation-Nuclear			
Generating Plant	12-16-77	**2,405,229	**1,998,718
Total		516,077,099	511,992,845
Annexation charges received from other annexed areas not listed above having no remaining balance		520,059,006	

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

**Principal only.

SAN DIEGO COUNTY WATER AUTHORITY

Table 14
WATER SALES BY METROPOLITAN WATER DISTRICT
Fiscal Years 1941-42 to 1985-86

Year	To Member Municipalities					Total	
	Natural Water		Treated Water		Total to Agencies		To Others
	Acre Feet	Percent	Acre Feet	Percent	Acre Feet		Acre Feet
1941-42	-0-	-0-	9,372.6	100	9,372.6	70.7	
1942-43	-0-	-0-	14,457.8	100	14,457.8	2,026.4	
1943-44	-0-	-0-	15,874.9	100	15,874.9	3,301.8	
1944-45	-0-	-0-	30,591.3	100	30,591.3	1,715.7	
1945-46	-0-	-0-	46,685.8	100	46,685.8	1,264.2	
1946-47	-0-	-0-	59,861.8	100	59,861.8	524.0	
1947-48	41,093.5	36	71,995.4	64	113,088.9	116.8	
1948-49	71,642.6	49	73,237.1	51	144,879.7	128.4	
1949-50	69,308.0	49	72,936.0	51	142,244.0	23,371.6	
1950-51	75,000.9	54	63,493.1	46	138,494.0	26,978.6	
1951-52	66,674.3	44	84,616.1	56	151,290.4	42,464.2	
1952-53	30,845.3	24	99,589.6	76	130,434.9	31,682.4	
1953-54	120,773.0	51	115,550.6	49	236,323.6	7,820.7	
1954-55	192,544.7	59	134,923.3	41	327,468.0	58,184.5	
1955-56	190,337.2	53	169,506.4	47	359,843.6	45,562.9	
1956-57	286,059.1	60	191,110.7	40	477,169.8	66,074.1	
1957-58	266,024.1	57	197,900.0	43	463,924.1	75,612.8	
1958-59	244,354.2	46	282,248.1	54	526,602.3	74,107.1	
1959-60	425,019.0	58	304,874.8	42	729,893.8	3,523.2	
1960-61	594,521.1	64	335,207.2	36	929,728.3	4,099.4	
1961-62	608,811.0	66	312,975.9	34	921,786.9	3,676.9	
1962-63	668,881.8	66	348,092.6	34	1,016,974.4	3,677.0	
1963-64	671,853.4	63	388,553.9	37	1,060,407.3	3,776.7	
1964-65	645,577.3	58	471,042.0	42	1,116,619.3	5,035.3	
1965-66	550,630.8	52	503,424.9	48	1,054,055.7	4,821.8	
1966-67	523,141.2	50	531,659.7	50	1,054,800.9	4,513.0	
1967-68	514,248.1	48	557,730.9	52	1,071,979.0	4,934.9	
1968-69	455,174.3	43	599,237.7	57	1,054,412.0	2,232.4	
1969-70	482,256.9	41	692,846.4	59	1,165,103.3	650.0	
1970-71	520,983.9	46	612,511.6	54	1,133,495.5	150.3	
1971-72	590,356.9	47	656,635.9	53	1,246,992.8	549.6	
1972-73	569,290.7	48	606,120.4	52	1,175,411.1	4.3	
1973-74*	655,058.0	52	593,380.0	48	1,248,438.0	955.0	
1974-75*	721,970.0	54	607,013.0	46	1,328,983.0	653.0	
1975-76*	735,100.0	53	653,154.0	47	1,388,254.0	994.0	
1976-77*	560,124.0	40	829,773.0	60	1,389,897.0	569.0	
1977-78*	508,036.0	40	757,270.0	60	1,265,306.0	22,019.0	
1978-79*	434,455.0	35	777,173.0	65	1,211,628.0	24,256.0	
1979-80	438,414.0	34	843,800.0	66	1,282,214.0	2,620.0	
1980-81	487,833.0	33	975,177.0	67	1,463,010.0	588.0	
1981-82	562,650.0	37	940,660.0	63	1,503,310.0	989.0	
1982-83	314,190.0	26	912,172.0	74	1,226,362.0	207.0	
1983-84	364,608.5	26	1,062,123.5	74	1,426,732.0	1,210.0	
1984-85	455,061.0	29	1,119,443.0	71	1,574,504.0**	934.0	
1985-86	500,995.0	30	1,145,856.0	70	1,646,851.0**	346.0	

*Revised
**Includes deliveries of reclaimed water to Las Virgenes and Coastal MWD.

TABLES

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


M.W.D. Member Agencies	1984-1985 Fiscal Year			1985-1986 Fiscal Year			Total	Difference of Totals	Percent of Difference of Totals	Difference of M.W.D. Supply	Percent of Difference of M.W.D. Supply
	Local Water Supply	M.W.D. Water Supply	Total Demands	Local Water Supply	M.W.D. Water Supply	Total Use					
	(2)	(3)	(4)	(5)	(6)	(7)					
Anaheim	36,261	32,673	68,934	43,911	23,376	67,287	(1,647)	(2)	(9,297)	(28)	
Beverly Hills	0	14,869	14,869	0	14,578	14,578	(291)	(2)	(291)	(2)	
Burbank	3,026	20,189	23,215	1,014	22,505	23,519	104	0	2,116	10	
Calleguas M.W.D.	26,394	86,123	112,517	25,055	87,074	112,129	(388)	(0)	951	1	
Central Basin M.W.D.	128,850	133,423	262,273	147,089	114,884	261,973	(280)	(0)	(18,539)	(14)	
Chino Basin M.W.D.	151,254	29,761	181,015	163,968	35,322	199,290	18,275	10	5,561	19	
Coastal M.W.D.	87	40,803	40,890	0	45,502	45,502	4,612	11	4,609	12	
Compton	4,338	5,734	10,072	5,307	5,009	10,316	244	2	(725)	(13)	
Eastern M.W.D.	99,358	28,868	128,226	101,419	27,765	129,184	958	1	(1,103)	(4)	
Foothill M.W.D.	5,820	10,905	16,725	5,965	10,731	16,696	(29)	(0)	(174)	(2)	
Fullerton	14,743	18,577	33,320	18,618	15,405	34,023	703	2	(3,172)	(17)	
Glendale	6,259	23,570	29,829	8,533	21,498	30,031	202	1	(2,072)	(9)	
Las Virgenes	0	15,858	15,858	0	15,783	15,783	(75)	(0)	(75)	(0)	
Long Beach	28,420	48,951	77,371	30,397	47,767	78,164	793	1	(1,184)	(2)	
Los Angeles	628,333	46,552	674,885	594,111	81,855	675,966	1,081	0	35,303	76	
Orange County M.W.D.	160,542	224,296	384,838	161,230	235,917	397,147	12,309	3	11,621	5	
Pasadena	16,676	22,726	39,402	15,009	23,779	38,788	(614)	(2)	1,053	5	
San Diego C.W.A.	133,634	434,172	567,806	96,562	486,579	583,141	15,335	3	52,407	12	
San Fernando	3,679	48	3,727	3,443	429	3,872	146	4	372	653	
San Marcos	5,139	48	5,187	7,317	152	7,469	2,282	44	104	217	
Santa Ana	32,927	15,597	48,524	34,334	14,089	48,423	(101)	(0)	(1,508)	(10)	
Santa Monica	8,726	9,496	18,222	8,967	9,320	18,287	65	0	(176)	(2)	
Three Valleys M.W.D.	63,606	54,846	118,452	63,044	54,074	117,118	(734)	(1)	(172)	(0)	
Torrance	11,004	19,044	30,048	11,774	17,072	28,846	(1,202)	(4)	(1,972)	(10)	
Upper San Gabriel Valley M.W.D.	169,238	10,025	179,263	170,280	13,255	183,535	4,272	2	3,230	32	
West Basin M.W.D.	5,483	184,521	190,004	15,915	172,862	188,777	(1,227)	(1)	(11,659)	(6)	
Western M.W.D. of Riverside Co.	176,000	43,122	219,122	175,840	49,870	225,710	5,988	3	6,748	16	
Totals	1,920,377	1,574,806	3,495,183	1,909,102	1,646,852	3,555,954	60,771	2	72,046	5	

SAN DIEGO COUNTY WATER AUTHORITY
Financial Statements and Schedule
June 30, 1986 and 1985
(With Accountants' Report Thereon)

The Board of Directors
San Diego County Water Authority

I have examined the balance sheet of the San Diego County Water Authority as of June 30, 1986 and the related statements of earnings, changes in equity, and changes in financial position for the year then ended. My examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as I considered necessary in the circumstances. The financial statements of the San Diego County Water Authority for the year ended June 30, 1985, were examined by other auditors whose report dated September 20, 1985 expressed an unqualified opinion on those statements.

In my opinion, the June 30, 1986 financial statements referred to above present fairly the financial position of the San Diego County Water Authority at June 30, 1986 and the results of its operations and the changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis with that of the preceding year.



Lois A. Brozey, CPA

San Diego, California

September 5, 1986

SAN DIEGO COUNTY WATER AUTHORITY

Balance Sheets

June 30, 1986 and 1985

(amounts shown in 000's)

	1986	1985	1986	1985
Assets				
Current assets:				
Cash and certificates of deposit	\$ 29,517	\$ 21,097		
Accounts and loans receivable, net of allowance for delinquent taxes of \$93 in 1985	11,822	11,949		
Interest receivable	79	-		
Inventory of water in storage	4,020	3,640		
Prepaid expenses	48	43		
Total current assets	<u>35,686</u>	<u>35,729</u>		
Restricted assets:				
Debt redemption:				
Metropolitan bonds:				
Cash and certificates of deposit	2,331	2,367		
Taxes and interest receivable, less allowance for delinquent taxes of \$47 in 1986 and \$192 in 1985	196	219		
U.S. Government contracts:				
Cash and certificates of deposit	184	218		
Due from Metropolitan Water District (note 3)	1,727	1,824		
Taxes and interest receivable, less allowance for delinquent taxes of \$8 in 1985	-	5		
Capital improvements:				
Cash and certificates of deposit	95,377	1,290		
Taxes and interest receivable, less allowance for delinquent taxes of \$39 in 1986 and \$55 in 1985	2,190	364		
Unmatured issue costs	877	411		
Investment in annuity contract	657	521		
Total restricted assets	<u>103,338</u>	<u>7,063</u>		
Property, plant, and equipment, net (note 2)	<u>135,362</u>	<u>135,476</u>		
	<u>\$275,067</u>	<u>\$177,268</u>		
Liabilities and Equity				
Current liabilities payable from current assets:				
Accounts payable				
Advances and deposits by agencies				
Accrued expenses				
Total current liabilities payable from current assets	<u>25,194</u>	<u>23,644</u>		
Current payments payable from restricted assets:				
Principal installments on long-term debt (note 3)	4,885	6,794		
Accounts payable	67	-		
Accrued interest payable	350	345		
Total current liabilities payable from restricted assets	<u>5,302</u>	<u>7,139</u>		
Deferred compensation payable	<u>637</u>	<u>322</u>		
Long-term debt (notes 3 and 4):				
General obligation waterworks bonds	14,460	17,285		
U.S. Government contracts	3,234	3,463		
Notes payable to bank	4,000	6,000		
Contract notes payable	6,000	13,000		
Pawn loan obligation	100,000	-		
	144,094	39,888		
Less current installments	<u>4,885</u>	<u>6,794</u>		
Long-term debt	<u>139,209</u>	<u>33,094</u>		
Fund balance - Exhibit C	<u>389,565</u>	<u>92,627</u>		
	<u>\$275,067</u>	<u>\$177,268</u>		

See accompanying notes to financial statements

SAN DIEGO COUNTY WATER AUTHORITY
 Statements of Earnings
 Years Ended June 30, 1986 and 1985
 (amounts shown in 000's)

	1986	1985
Operating revenue:		
Water sales	\$94,010	\$87,790
Cost of water sold	<u>89,031</u>	<u>83,350</u>
Margin from water sales	<u>4,979</u>	<u>4,440</u>
Net revenues - hydroelectric sales	<u>418</u>	<u>-</u>
Total operating revenues	<u>5,397</u>	<u>4,440</u>
Operating expenses:		
Water treatment	98	104
Systems operations	339	322
Maintenance of structures and plant	789	630
Automotive operation, maintenance, and shop expense	71	86
Depreciation	1,597	1,468
Administrative and general salaries	810	632
General expense and supplies	673	718
Total operating expenses	<u>4,377</u>	<u>3,960</u>
Earnings from operations	<u>1,020</u>	<u>480</u>
Nonoperating income (expense):		
Property taxes	7,373	7,833
Interest expense, net of interest capitalized of \$3,414 in 1986 and \$1,118 in 1985	<u>(3,032)</u>	<u>(1,939)</u>
Interest income, net of interest capitalized of \$4,445 in 1986	2,116	2,180
Other	39	(78)
Net earnings	<u>\$ 7,516</u>	<u>\$ 8,476</u>

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY
 Statements of Changes in Equity
 Years Ended June 30, 1986 and 1985
 (amounts shown in 000's)

	Total Equity	Restricted Balances				Property, Plant, and Equipment
		Restricted Balance	Appropriated Long-Term Projects	U.S. Government Contract	Capital Improvements	
Balance July 1, 1986	\$ 86,079	\$ 1,341	\$ 2,405	\$ 2,335	\$ 1,204	\$ 68,237
Additions (deductions):						
Net earnings (loss)	8,476	3,290	-	180	3,337	(1,448)
Capital expenditures for property, plant, and equipment from:						
Restricted and capital improvement assets	81	(19,943)	-	-	-	(1,118)
Contributions from member agencies	-	7,257	(1,236)	(349)	(2,330)	42,000
Debt redemption	-	2,000	-	-	-	(2,017)
Transfer, net	-	-	-	-	-	-
Increase in long-term debt	-	-	-	-	-	-
Increase in long-term debt	82,027	8,290	2,175	2,167	2,111	25,545
Balance June 30, 1986	107	5	-	133	2,387	102
Additions (deductions):	7,316	1,422	-	-	-	(1,597)
Prior period adjustments	-	-	-	-	-	-
Net earnings (loss)	-	-	-	-	-	-
Capital expenditures for property, plant, and equipment from:						
Restricted assets	255	(2,160)	-	-	-	1,031
Contributions from member agencies	-	-	-	-	-	(2,000)
Debt redemption	-	(126)	-	(349)	(2,425)	8,795
Transfer, net	-	-	226	-	-	-
Increase in long-term debt	-	-	-	-	-	-
Increase in long-term debt	8,061	8,377	2,399	3,311	8,207	(93,000)
Balance June 30, 1985	\$100,395	\$ 8,377	\$ 2,399	\$ 3,311	\$ 8,207	\$112,115

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY
 Statements of Changes in Financial Position
 Years ended June 30, 1986 and 1985
 (amounts shown in 000's)

	1986	1985
Sources of working capital:		
From operations:		
Net earnings	\$ 7,516	\$ 8,476
Add depreciation which does not use working capital	1,597	1,468
Working capital provided by operations	9,113	9,944
Other sources:		
Proceeds from long-term debt	100,000	7,000
Contributions from member agencies	255	81
Decrease assets:		
U.S. Government contract	236	188
Capital improvements	-	1,799
Waterworks bonds	38	-
	109,642	19,012
Uses of working capital:		
Retirement of long-term debt	11,794	4,700
Capital expenditures	1,383	11,146
Increase assets:		
Waterworks bonds	-	807
Capital improvements	96,798	-
	109,975	16,653
Net increase (decrease) in working capital	\$ (333)	\$ 2,359

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY

EXHIBIT D
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SAN DIEGO COUNTY WATER AUTHORITY
Statements of Changes in Financial Position
Years ended June 30, 1986 and 1985
(amounts shown in 000's)

	<u>1986</u>	<u>1985</u>
Changes in components of working capital:		
Increase (decrease) in current assets:		
Cash and certificates of deposit	\$ (1,080)	\$ 3,871
Accounts and taxes receivable	(147)	2,661
Interest receivable	29	-
Inventory of water in storage	2,390	27
Prepaid expenses	23	3
	<u>1,215</u>	<u>6,562</u>
Increase (decrease) in current liabilities payable from current assets:		
Accounts payable	1,337	4,240
Advances and deposits by agencies	131	(43)
Accrued expenses	80	6
	<u>1,548</u>	<u>4,203</u>
Net increase (decrease) in working capital	<u>\$ (333)</u>	<u>\$ 2,359</u>

See accompanying notes to financial statements.

SAN DIEGO COUNTY WATER AUTHORITY
Notes to Financial Statements
June 30, 1986 and 1985

(1) Summary of Significant Accounting Policies

(a) Accounting Method:

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

(b) Taxes Receivable:

Uncollected taxes receivable are recorded at the amount billed. An allowance is established for the amount estimated to be uncollectible within the ensuing year.

(c) Inventories of Water in Storage:

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

(d) Property, Plant, and Equipment:

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

(2) Property, Plant, and Equipment

	<u>1986</u> (000's)	<u>1985</u> (000's)
Property, plant, and equipment	\$150,052	\$139,324
Construction work in progress	9,027	18,276
	<u>159,079</u>	<u>157,600</u>
Less accumulated depreciation	<u>23,717</u>	<u>22,126</u>
Net property, plant, and equipment	<u>\$135,362</u>	<u>\$135,474</u>

SAN DIEGO COUNTY WATER AUTHORITY

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

June 30, 1986 and 1985

(3) Long-Term Debt	Interest rate	1986 (000's)	1985 (000's)
General obligation bonds:			
Waterworks bonds, 1957, maturing February 1, 1987-1994	11-6%	\$ 13,960	\$ 15,640
Waterworks bonds, 1966, maturing October 1, 1986-2004	4.5%-5.5%	20,900	21,645
Total general obligation bonds		<u>34,860</u>	<u>37,285</u>
U.S. Government contract maturing 1986-1995, second pipeline:			
Authority's share	2.6%	1,507	1,679
Metropolitan Water District's share	2.6%	1,727	1,924
Total U.S. Government contract		<u>3,234</u>	<u>3,603</u>
Note payable to bank, maturing June 25, 1987-1988	7.1%	4,000	6,000
Contract note payable, maturing May 1, 1988-1990	9.25%-10%	6,000	6,000
Contract note payable, maturing March 1, 1990-1992	5.05%-5.25%	-	7,000
Total contract notes		<u>6,000</u>	<u>13,000</u>
Pamo Dam obligation maturing November 1, 1988-2005	variable	100,000	-
Total long-term debt		148,094	59,888
Less current installments of long- term debt		<u>4,885</u>	<u>4,794</u>
Long-term debt, excluding current installments		<u>\$143,209</u>	<u>\$ 55,094</u>

The Metropolitan Water District's share of U.S. Government contract, \$1,726,794 and \$1,924,142 at June 30, 1986 and 1985, is also recorded as Due from Metropolitan Water District.

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

June 30, 1986 and 1985

(3) Long-Term Debt (continued)

Maturities of long-term debt are summarized as follows:

Fiscal Year Ended June 30,	(000's)
1987	\$ 4,885
1988	6,000
1989	9,300
1990	8,619
1991-1995	33,895
1996-2000	33,830
2001-2006	51,565
	<u>\$148,094</u>

As the principal and interest payments on waterworks bonded indebtedness come due, the Authority transfers funds in trust to a paying agent who makes the payments directly to the bond holders. Accordingly, the amounts transferred to the paying agent are not included in the financial statements.

In prior years, the Authority had available a \$10 million line of credit with its primary bank. The Authority discontinued this line of credit in fiscal 1986 as it was not needed.

(4) Pamo Dam Obligation

On November 20, 1985, the Authority issued \$100 million of certificates of participation the proceeds of which are primarily intended for the Pamo Dam Project which includes construction of a dam and related facilities in Pamo Valley, California. From these proceeds \$7 million was used to refund certificates of participation previously issued. The remaining proceeds were deposited with a trustee who used a portion of the funds to pay various issuance costs. The trustee has invested the balance of the funds pending the issuance of the necessary construction permit for the dam. Accrued interest is being paid to the certificate holders from the trust account.

At June 30, 1986 the construction permit had not been issued. If the permit is not issued by June 15, 1987, the trustee is required to return the certificate holders' investment to them in accordance with the terms of the trust agreement.

SAN DIEGO COUNTY WATER AUTHORITY

SAN DIEGO COUNTY WATER AUTHORITY

Notes to Financial Statements

June 30, 1986 and 1985

(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 \$372,526 in 1986 and \$265,895 in 1985 which included amortization of prior service costs.