

**SAN DIEGO
COUNTY WATER AUTHORITY**



**FORTY-THIRD ANNUAL REPORT
1989**

SAN DIEGO COUNTY WATER AUTHORITY

Organized June 9, 1944

FORTY-THIRD ANNUAL REPORT

of Authority Operations
for Fiscal Year Ending June 30, 1989

Lester A. Snow
General Manager

SAN DIEGO, CALIFORNIA
1989

SAN DIEGO COUNTY WATER AUTHORITY

CONTENTS

Chapter	Page
Member Agencies	v
Directors	vi
MWD Representatives	xi
Authority Officers	xii
Members of Standing Committees	xiii
General Manager Letter	xv
Report of Activities	xvii
1. BOARD OF DIRECTORS	1
General	1
Major Board Actions	2
2. WATER COMPOSITION	15
General and Area	15
Population and Assessed Valuation	16
3. WATER SUPPLY AND CONSUMPTION	18
Source and MWD Facilities	18
Authority Facilities	20
Deliveries and Rates	21
Ramona Storage Agreement	25
Water Production of Member Agencies	25
Water Quality	27
Agricultural Water Use	28
Water Treatment	28
Allocation of Water to Member Agencies	29
Future Supplies	31
4. OPERATION AND MAINTENANCE	34
General	34
Operations	35
Maintenance	38
Force Construction	41
Shutdowns	41
5. DESIGN AND CONSTRUCTION	43
General	43
Ramona Pipeline	43
Shepard Canyon Pipeline	43
Water Distribution Improvement Plan	45
Pamo Dam and Reservoir	47
Other Projects	47
6. WATER RECLAMATION	49
Model Water Reclamation Ordinance and Technical Assistance Program ..	49
Clean Water Project of Greater San Diego	49
Average Reclamation Water Production	50
7. WATER RESOURCES PLANNING	52
Water Resources Plan and Water Storage Evaluation	52
Water Supply Development	52
Water Conservation Projects	53
General Planning Services	53

*The New San Diego County
Water Authority Headquarters
3211 Fifth Avenue - San Diego, CA 92103
Occupied February 17, 1989*



SAN DIEGO COUNTY WATER AUTHORITY

CONTENTS

Chapter	Page
8. PUBLIC INFORMATION	55
Water Conservation	55
Publications	55
Water Awareness Week and Education	57
Xeriscape	59
Public Information Council	59
9. HUMAN RESOURCES	61
Employment	61
Employee Relations	63
Special Activities	63
10. TREASURER'S REPORT	65
11. LEGAL DEPARTMENT	67
Routine Matters and Contractual Matters	67
Reclamation Actions and MWD Matters	68
Standby Charges	68
San Diego Gas and Electric	69
Legislation	69
12. METROPOLITAN WATER DISTRICT MEMBERSHIP	71
Water Sales and Tax Rate	74
13. COLORADO RIVER BOARD MEMBERSHIP	77

TABLES

1. Statistical Summary— Authority 1987-89	78
2. Population Growth— Authority and County Through 1989	79
3. Area— Authority Member Agencies 1988-89	80
Population— Authority Member Agencies and County 1970-89	81
4. Water Production, Agricultural Use and Authority Storage 1988-89	82
5. Assessed Valuation and Tax Collections 1988-89	84
6. Water Production— Authority Member Agencies 1988-89	86
7. Water Sales By Authority 1947-89	87
8. Sales of Imported Water— Fiscal Year 1988-89	88
9. Assessed Valuation of Tax Rates— Authority 1945-89	90
Tax Levies and Collection— Authority 1945-89	91
10. Chemical Character and Analysis of Colorado River Water Year ending June 30, 1989	92
11. Chemical Character and Analysis of Blended Water at Lake Skinner Year Ending June 30, 1989	93
12. Assessed Valuation and Tax Rate of Metropolitan Water District of Southern California 1929-89	94
13. Annexation Charges and Balances by Metropolitan Water District on Authority Areas	95
14. Water Sales by Metropolitan Water District 1941-89	96
15. Water Production-Metropolitan Water District Constituent Area 1987-89	97

SAN DIEGO COUNTY WATER AUTHORITY

CONTENTS

Chapter	Page
---------	------

FIGURES

1. Authority Service Area within San Diego County	xvi
2. Authority Organization Chart	xix
3. Authority Area, Population and Assessed Valuation 1980-89	16
4. Authority Summary of Untreated Water Rates	23
5. Authority Water Production	24
6. Source of Water, Local, CWA and Total Supply	27
7. Rainfall Record of San Diego County	30
8. Water Revenue, Tax Rate, Tax Revenue	31
9. Water Improvement Plan Map	46
10. Average Reclaimed Water Production	50
11. Composition of Metropolitan Water District	72
12. CWA-MWD Service Area, Water Sales and MWD Water Rates	73
13. Map-Member Agencies of MWD	75

APPENDIX

A. SDCWA Financial Statements	99
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SAN DIEGO COUNTY WATER AUTHORITY

Member Agencies, Date of Entry and

Representative on Board of Directors on June 30, 1989

CITIES

Del Mar	Nov. 23, 1962
Bob Stevens	
Escondido	Oct. 9, 1950
George M. Lohnes, Jr.	
National City	June 9, 1944
Tom Crownover	
Oceanside	June 9, 1944
James F. Turner	
Poway	April 21, 1954
Alan D. Archibald	
San Diego	June 9, 1944
Dr. Charles F. Cooper, Christine Frahm, Francesca M. Krauel, John M. Leach, Michael D. Madigan, Joseph Parker, Michael E. Parrish, 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
Anne Omsted	

IRRIGATION DISTRICTS

Santa Fe	Dec. 13, 1948
John M. Cranston	
South Bay	Nov. 3, 1952
Cary F. Wright	
(Includes City of Chula Vista, an independent member agency, from June 9, 1944 to November 3, 1952)	

MUNICIPAL WATER DISTRICTS

Bueno Colorado	June 11, 1954
William D. Taylor	
Carlsbad	June 16, 1954
Margaret J. Bonas	
De Luz Heights	June 28, 1967
George C. Shippey	
Olivenhain	July 25, 1960
William Hollingsworth	
Padre Dam	June 7, 1956
W.E. Klostermann	
(Includes Lakeside I.D., an independent member agency, from June 9, 1944 to June 7, 1956)	
Rainbow	April 10, 1954
Herbert H. Stickney	
Ramona	August 27, 1957
Vernon L. Leming	
Rincon del Diablo	June 14, 1954
Sherwood D. Anderson	
Valley Center	May 9, 1955
John F. Hennigar	
Yuima	Dec. 16, 1963
James H. Singer	

PUBLIC UTILITY DISTRICT

Fallbrook	June 9, 1944
Gordon W. Tinker	

FEDERAL AGENCY

Pendleton Military Reservation	Dec. 16, 1977
Lawrence E. Carlson	

COUNTY WATER DISTRICT

Vallecitos	Feb. 25, 1980
Dale Mason	

COUNTY OF SAN DIEGO (ex officio)

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

OFFICERS OF BOARD OF DIRECTORS

1988-89



Chairman
DALE MASON
Vallecitos Water District
3-80 to 6-89



Vice Chairman
MICHAEL D. MADIGAN
City of San Diego
5-79 to 6-89



Secretary
HERBERT H. STICKNEY
Rainbow
Municipal Water District
3-85 to 6-89

BOARD OF DIRECTORS

1988-89



S.D. ANDERSON
Rincon Del Diablo
Municipal Water District
8-78 to 6-89



CRAIG S. ANDREWS
City of San Diego
5-83 to 4-89



ALAN D. ARCHIBALD
City of Poway
10-82 to 6-89



PHILIP BERG
De Luz Heights
Municipal Water District
3-86 to 12-88



MARGARET J. BONAS
Carlsbad
Municipal Water District
3-87 to 6-89

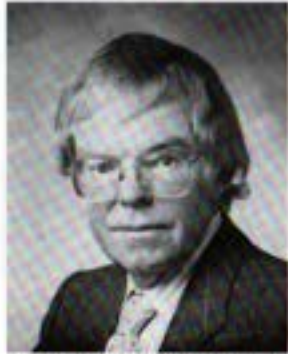


LAWRENCE E. CARLSON
Pendleton Military
Reservation
12-86 to 6-89

BOARD OF DIRECTORS

1988-89

(Continued)



DR. CHARLES F. COOPER
City of San Diego
4-73 to 6-89



JOHN M. CRANSTON
*Santa Fe
Irrigation District*
10-64 to 6-89



TOM CROWNOVER
National City
6-76 to 6-89



NAT L. EGGERT
Helix Water District
10-77 to 6-89



CHRISTINE FRAHM
City of San Diego
3-88 to 6-89



SUSAN GOLDING
County of San Diego
2-86 to 6-89



HARRY GRIFFEN
*Helix
Water District*
7-56 to 6-89



JOHN F. HENNIGAR
*Valley Center
Municipal Water District*
10-76 to 6-89



WILLIAM HOLLINGSWORTH
*Olivenhain Municipal
Water District*
5-86 to 6-89

BOARD OF DIRECTORS

1988-89

(Continued)



W.E. KLOSTERMANN
*Padre Dam Municipal
Water District*
2-83 to 6-89



FRANCESCA M. KRAUEL
City of San Diego
7-78 to 6-89



JOHN M. LEACH
City of San Diego
5-86 to 6-89



VERNON LEE LEMING
*Ramona
Water District*
2-87 to 6-89



GEORGE M. LOHNES, JR.
City of Escondido
6-86 to 6-89



MICHAEL D. MADIGAN
City of San Diego
5-79 to 6-89



DALE MASON
*Vallecitos
Water District*
3-80 to 6-89



ANNE OMSTED
*San Dieguito
Water District*
2-87 to 6-89



JOSEPH PARKER
City of San Diego
3-77 to 6-83
5-86 to 6-89

BOARD OF DIRECTORS

1988-89

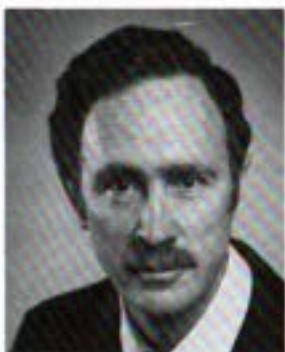
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MICHAEL E. PARRISH
City of San Diego
4-89 to 6-89



PAUL A. PETERSON
City of San Diego
6-83 to 6-89



PHILIP R. PRYDE
City of San Diego
9-85 to 6-89



GEORGE C. SHIPPEY
De Luz Heights
Municipal Water District
12-88 to 6-89



JAMES H. SINGER
Yuma
Municipal Water District
5-86 to 6-89



WAYNE W. SMITH
South Bay
Irrigation District
6-87 to 11-88



JOHN P. STARKEY
City of San Diego
10-75 to 6-89



BOB STEVENS
City of Del Mar
2-87 to 6-89



HERBERT H. STICKNEY
Rainbow Municipal
Water District
3-85 to 6-89

BOARD OF DIRECTORS

1988-89

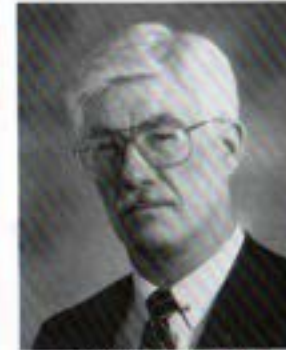
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WILLIAM D. TAYLOR
Bueno Colorado
Municipal Water District
4-88 to 6-89



GORDON W. TINKER
Fallbrook Public
Utility District
4-83 to 6-89



JAMES F. TURNER
City of Oceanside
8-86 to 6-89



MARK W. WATTON
Otay Water District
2-85 to 6-89



CARY F. WRIGHT
South Bay
Irrigation District
11-88 to 6-89

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



HARRY GRIFFEN
1-63 to 6-89



JOHN F. HENNIGAR
10-86 to 6-89



FRANCESCA M. KRAUEL
10-83 to 6-89



MICHAEL D. MADIGAN
7-82 to 6-89



DALE MASON
12-86 to 6-89



JOHN P. STARKEY
1-81 to 6-89

**WATER AUTHORITY MANAGEMENT
ON JUNE 30, 1989**



LESTER A. SNOW
General Manager



ERGUN BAKALL
Chief Engineer



SHIRLEY A. JACKSON
*Assistant General Manager—
Administration*



CHARLES N. RHODES
*Assistant General Manager
Water Resources*



HENRY G. LOZANO
*Director of Finance
and Treasurer*



CINDY M. HEINZ
Executive Secretary



PAUL D. ENGSTRAND
General Counsel

SAN DIEGO COUNTY WATER AUTHORITY

**ROSTER OF STANDING COMMITTEES
AS OF JUNE 30, 1989**

Administrative Policy

Anne Omsted, Chairman
Christine Frahm, Vice Chairman
George C. Shippey
Lawrence E. Carlson
Charles F. Cooper
William Hollingsworth
W.E. Klostermann
Francesca M. Krauel
James F. Turner
Cary F. Wright

Fiscal Policy

John M. Leach, Chairman
Margaret J. Bonas, Vice Chairman
Herbert H. Stickney
Nat L. Eggert
John P. Starkey
James H. Singer
James F. Turner
Michael E. Parrish
Harry Griffen
George M. Lohnes, Jr.

Long Range Planning

Philip R. Pryde, Chairman
John M. Cranston, Vice Chairman
John M. Leach
Tom Crownover
Alan D. Archibald
George C. Shippey
Paul A. Peterson
Gordon W. Tinker
William Hollingsworth

Water Policy

Charles F. Cooper, Chairman
Susan Golding, Vice Chairman
John F. Hennigar
Harry Griffen

Water Policy (Continued)

Francesca M. Krauel
Michael D. Madigan
John P. Starkey
Herbert H. Stickney
Bob Stevens
John M. Cranston

Engineering & Operations

Sherwood D. Anderson, Chairman
Vernon L. Leming, Vice Chairman
Alan D. Archibald
Lawrence E. Carlson
William D. Taylor
Tom Crownover
John F. Hennigar
George M. Lohnes, Jr.
Michael E. Parrish
Philip R. Pryde

Public Information

Joseph Parker, Chairman
Nat L. Eggert, Vice Chairman
Gordon W. Tinker
Cary F. Wright
Mark W. Watton
Christine Frahm
Susan Golding
James H. Singer
William D. Taylor

Water Reclamation

Mark W. Watton, Chairman
Paul A. Peterson, Vice Chairman
Bob Stevens
Sherwood D. Anderson
Margaret J. Bonas
W.E. Klostermann
Vernon L. Leming
Michael D. Madigan
Anne Omstead
Joseph Parker

SAN DIEGO COUNTY WATER AUTHORITY

**ROSTER OF STANDING COMMITTEES
AS OF JUNE 30, 1989
(Continued)**

TEMPORARY (AD HOC) COMMITTEES

Pamo Dam Steering

Michael D. Madigan, Chairman
Harry Griffen, Vice Chairman
Craig S. Andrews
John M. Cranston
Francesca M. Krauel
Paul A. Peterson
Philip R. Pryde
Gordon W. Tinker

Underwriter Selection Committee

Harry Griffen, Chairman
John P. Starkey
Herbert H. Stickney

Audit Subcommittee

Margaret J. Bonas, Chairman
Nat L. Eggert
Joseph Parker
William Hollingsworth

Directors Per Diem

Anne Omsted, Chairman
Christine Frahm
Francesca M. Krauel

**Guaranteed Investment
Contract Evaluation**

Herbert H. Stickney, Chairman
James F. Turner
Harry Griffen

**General Manager Evaluation
Subcommittee**

James F. Turner, Chairman
William Hollingsworth
Francesca M. Krauel

Logo Subcommittee

Joe Parker, Chairman
Margaret J. Bonas
Charles F. Cooper
Christine Frahm
Philip R. Pryde
John P. Starkey

SDG&E Issues Ad Hoc

Dale Mason, Chairman
Michael D. Madigan,
Vice Chairman
Paul A. Peterson
Francesca M. Krauel
Herbert H. Stickney
Mark W. Watton

Legal Issues

Paul A. Peterson, Chairman
Francesca M. Krauel
John F. Hennigar
Herbert H. Stickney
Christine Frahm
Mark W. Watton
John M. Leach
Anne Omsted

**Public Information Goals
and Mission**

Christine Frahm, Chairman
Mark W. Watton
James H. Singer



San Diego County Water Authority

3211 Fifth Avenue • San Diego, California 92103-5718
(619) 297-3218 FAX 297-0511

March 30, 1990

Board of Directors
San Diego County Water Authority

It is my pleasure to present this forty-third Annual Report of the San Diego County Water Authority's activities during the fiscal year ending June 30, 1989.

This past year has been one of continued rapid change and advancement as the Authority positions itself to meet the growing water demands for the San Diego region. Major accomplishments include the adoption of the Capital Improvement Program guiding \$530 million in facility improvements, adding pipeline capacity for growing needs and providing additional system security and reliability. Under the direction of Authority staff, consultants began preparing a comprehensive assessment of water storage needs with the goal of developing an optional storage strategy. The newly created Water Resources Planning department also began the development of the Authority's first Water Resources Plan which will help guide the Authority's resource and water policy activities into the next century. Water Authority staff have also taken active roles in the California Water Resources Control Board's Bay Delta process, where many important decisions regarding statewide water resources are being made.

The public visibility of the Authority in 1989 increased due in part to involvement in the decisions surrounding the proposed merger of Southern California Edison and San Diego Gas and Electric. The Authority also unveiled a new water conservation public information program featuring the now well known Waterhog.

As the San Diego region heads into the final decade of this century, the Authority's Board of Directors and staff are already planning well into the next one to meet future demands for water. The past few years have seen dramatic changes in state and federal water policy and the future is likely to bring more such changes. Three years of drought in California and the west have reinforced the need for reliable water supplies. In order for the Authority to fulfill its mission of supplying the imported water needs of the region, the Board of Directors and staff will be making substantial efforts on a local and statewide level to evaluate the options before us and prudently plan for our water future. All of us at the Authority look forward to the challenges of the future.

Sincerely,

General Manager

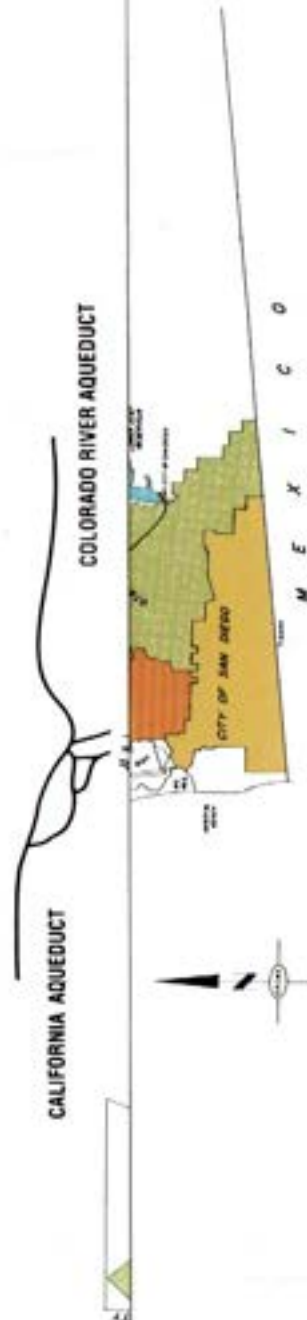
MEMBER AGENCIES

- CITIES**
- San Mar • Escondido • National City
 - Vista • Poway • San Diego
- COUNTY**
- San Diego (see office)

- IRRIGATION DISTRICTS**
- Santa Fe • South Bay
- WATER DISTRICTS**
- Falls • Chuy
 - San Diego

- COUNTY WATER DISTRICT**
- Vista
- PUBLIC UTILITY DISTRICT**
- Fullerton
- FEDERAL AGENCY**
- Poston Military Reservation

- MUNICIPAL WATER DISTRICTS**
- Banning • Escondido • San Marcos
 - Carlsbad • Escondido • San Marcos
 - Del Mar • Escondido • San Marcos
 - Escondido • Escondido • San Marcos
 - Escondido • Escondido • San Marcos



Note: Some agency boundaries are overlapping. Questions concerning current agency boundaries should be directed to that agency in question.

Figure 1. Authority Area Within San Diego County

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

FISCAL YEAR 1988-89

The Water Authority performed an unprecedented administrative balancing act during fiscal year ending June 30, 1989: On the one hand, the Water Authority was committed to carry out its primary mission which is to provide, without interruption, a safe and reliable water supply to the San Diego region. On the other hand, it was incumbent upon the Water Authority to implement the reorganization and expansion plans undertaken by its board in order to insure an adequate water supply for future generations.

During the fiscal year, the Water Authority provided 626,502 acre feet of water, as compared with 580,152 acre feet during the previous fiscal year, an increase of 46,350 acre feet. The population within the Authority service area grew from 2,253,216 in fiscal year 1988 to 2,346,208 at the end of fiscal year 1989.

Public awareness of the critical nature of imported water supply was heightened with the introduction of new public information programs. A joint Public Information Council (JPIC) was formed with Authority member agencies. A pilot water conservation live-theater production was presented to area schools. A Waterhog mascot was created to emphasize the importance of water conservation.

Billboards, newspapers and radio advertising, press conferences, press releases, teacher education workshops, and conferences and seminars were used extensively to promote a variety of water conservation campaigns.

Construction of the Ramona Pipeline to serve treated water to Ramona MWD, the City of San Diego and Olivenhain MWD commenced in October 1988 and, by the end of June, the project was over 60 percent complete.

The Draft Environmental Impact Report (EIR) for the Water Distribution Improvement Plan also was completed during the year. Water Authority staff and consultants held nearly 50 public meetings to receive comments on the EIR. It is anticipated that the Final EIR will be certified and adopted by the Water Authority board during fiscal year 1990.

Water resources activities during the fiscal year included the approval of model water reclamation and conservation ordinances which could assist in producing over 100,000 acre feet of reclaimed water by the year 2010 and in increasing the efficiency of water use. Financial support under the Reclamation Technical Assistance Program resulted in the funding of member agency planning efforts for five major reclamation projects.

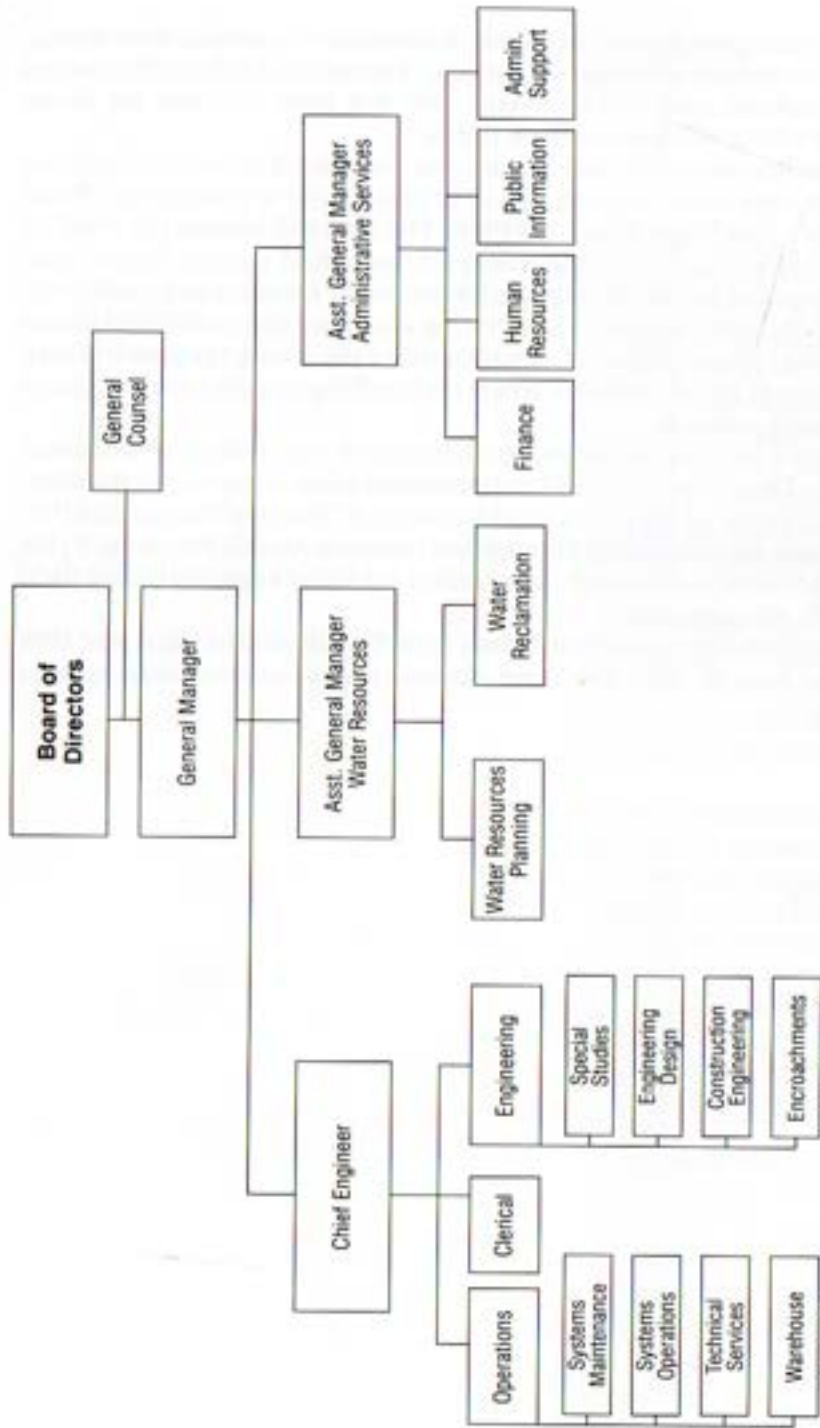
The potential impact of earthquakes on the aqueduct system, recurring droughts, the difficulty of the present delivery system to meet peak demands, and the inability to secure a section 404 permit from the U.S. Army Corps of Engineers to build the Pamo Dam and Reservoir project,

resulted in a decision to conduct a study to determine the optimal water storage and system operational needs of the region. The results of this study, expected to be completed early in Fiscal Year 1991 will form the basis for future measures which will address these needs.

A Water Resources Planning Department was created during the fiscal year to address long-term planning and policy issues and to produce the Water Authority's first Water Resources Plan. The plan will include the result of the Optimal Storage Study and a detailed analysis of specific future water resource options including imported water, water transfers and marketing, reclamation, desalinization, conservation and other non-traditional means for meeting future demands. Once adopted by the Board, the plan will map out a course of action needed to secure the San Diego region's resource needs into the next century.

Personnel administration was enhanced with the creation of a Human Resources Department. Significant personnel achievements were the selection of a Director of Personnel, establishment of Personnel Policies and Procedures, and development of an employee Incentive Awards Program. A plan to hire additional staff to meet the increased workload approved during fiscal year 1988, was completed.

The number of employees increased from 59 at the end of fiscal year 1988 to 82 as of June 30, 1989. The Water Authority organizational chart appears as Figure 2.



SAN DIEGO COUNTY WATER AUTHORITY
ORGANIZATION CHART

Figure No. 2



San Diego County Water Authority
Board of Directors
at
a regular Board of Directors Meeting

BOARD OF DIRECTORS

General

The San Diego County Water Authority is comprised of 24 member agencies and the County of San Diego as ex officio member. Each member agency is represented by at least one director. A member agency is entitled to one additional representative for each full five percent of total assessed valuation contained within its boundaries, as determined by the Assessor's Office of the County of San Diego. 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.

Officers of the Board of Directors are elected in July of even-numbered years. In July 1988, Dale Mason was elected Chairman; Michael D. Madigan, Vice Chairman; and Herbert H. Stickney, 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 seven standing committees:

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

Temporary committees that existed during this year were:

Audit	Logo Selection
Directors Per Diem	Pamo Dam Steering
General Manager Evaluation	Public Information Goals & Mission
Guaranteed Investment Contract Evaluations	SDG&E Issues
Legal Issues	Underwriter Selection

*Teaming near Ten Mile House
on Road to Flame - Circa 1886
San Diego Historical Society - Photograph Collection*

SAN DIEGO COUNTY WATER AUTHORITY

During fiscal year 1988-89, the following Directors were presented with service emblems:

<u>Director</u>	<u>Length of Service</u>
Philip R. Pryde	3 years
Herbert H. Stickney	3 years
Mark W. Watton	3 years
Alan D. Archibald	6 years
Sherwood D. Anderson	10 years
Francesca M. Krauel	10 years
Charles F. Cooper	15 years

During the year, the following Directors were seated or resealed:

<u>Date</u>	<u>Director</u>	<u>Agency</u>	<u>Term Expires</u>
Sept. 8, 1988	Vernon L. Leming	Ramona M.W.D.	Sept. 8, 1994
Sept. 8, 1988	Cary F. Wright	South Bay I.D.	Nov. 10, 1988
Nov. 10, 1988	Cary F. Wright	South Bay I.D.	Nov. 15, 1994
Dec. 8, 1988	George C. Shippey	De Luz Heights M.W.D.	July 19, 1991
April 13, 1989	Michael E. Parrish	City of San Diego	Feb. 24, 1995
April 13, 1989	Paul A. Peterson	City of San Diego	Oct. 27, 1994

MAJOR BOARD ACTION

July 14, 1988

- Motion: Approved the election of new Board officers – chairman, Dale Mason; Vice Chairman, Michael D. Madigan; Secretary, Herbert H. Stickney.
- Motion: Authorized the General Manager to advertise for construction bids for the Ramona pipeline.
- Motion: Authorized the General Manager to negotiate an agreement with the City of San Diego for payment of certain costs associated with the Ramona Pipeline.
- Resolution: Approved the appraisal of J.P. Meek Company, authorized the purchase of properties and authorized the noticing of the intention of the Board to adopt a resolution of necessity to acquire property by eminent domain.

BOARD OF DIRECTORS

- Resolution: Approved Revision No. 1 to Work Order 11-46, appropriating \$682,000 from Capital Outlay Fund to purchase materials, services and rights-of-way and to provide for staff expenses and financing costs for Ramona Pipeline.
- Motion: Authorized the payment of \$5,000 to the California Water Awareness Committee as support for the 1989 Water Awareness Week Campaign.
- Resolution: Authorized bank signatures for commercial account, savings account, certificates of deposit, payroll account, reclamation agency account and wiring of funds.
- Motion: Approved the awards for the Employee Incentive Awards Program which had been adopted by the Board on February 8, 1988.
- Resolution: Approved the amendment of Section 3.4.1 (Treasurer) of the Administrative Code.
- Resolution: Revised the water purchases appropriation for 1987-88.
- Motion: Approved the suspension of the permitting process for the Pamo Reservoir project.
- Motion: Took a position of support on S. 795.
- Motion: Took a position of support on AB 3088.
- Motion: Took a position of support on AB 982.

August 11, 1988

- Resolution: Declared the public interest and necessity for the acquisition of property for Ramona Pipeline and authorizing proceedings in eminent domain for the purpose of acquiring real property and interests in real property to be used in connection therewith.
- Motion: Authorized the General Manager to execute amended Storage Agreement No. 1899 MWD Storage Agreement.
- Motion: Authorized the funding of \$5,000 to the Metropolitan Water District for support of the expanded scope of work for the Delta Drinking Water Quality Study.

SAN DIEGO COUNTY WATER AUTHORITY

- Motion:** Approved Classification, Salary and Benefit Study conducted by Personnel Research Center and the method of implementation suggested by the General Manager.
- Resolution:** Amended Section 11.6(c) (The Contract Storage Pool) of the Administrative Code.
- Resolution:** Approved Revision No. 1 to Work Order 11-47, appropriating \$1,315,000 from the Capital Outlay Fund for the design of Pipeline 4B and authorized the General Manager to execute an agreement with Boyle Engineering.
- Resolution:** Approved Revision No. 1 to Work Order 11-49, appropriated \$2,530,000 from the Capital Outlay Fund for the design of the extension of Pipeline 4 and authorized the General Manager to execute an agreement with James M. Montgomery, Consulting Engineers, Inc.
- Resolution:** Authorized the design and construction of the Sweetwater Bypass Pipeline and appropriated \$500,000 from the Capital Outlay Fund for this purpose.
- Resolution:** Approved Work Order 1-71, appropriated \$25,000 upon payment of that amount by the City of San Diego, and authorized the General Manager to proceed with the design of the rehabilitation of the Shepherd Canyon Pipeline.
- Resolution:** Fixed the tax rate for Fiscal Year 1988-89.
- Resolution:** Established an in lieu charge to the City of San Diego for Fiscal Year 1988-89.
- Resolution:** Established the vote of the representatives of the Authority's member agencies as determined by assessed valuations for Fiscal Year 1988-89.
- Motion:** Authorized the expenditure of \$4,419.27 to cover production costs for the graphics for billboard advertising.
- Motion:** Authorized the General Manager to contribute \$1,000 for Water Authority participation in the development of a landscape video.

BOARD OF DIRECTORS

- Motion:** Authorized the General Manager to enter into an agreement with San Diego County Water Authority Employees, an affiliate of Local 911, International Brotherhood of Teamsters.
- Motion:** Authorized the General Manager to enter into an agreement with the Management and/or Confidential Employees Group.

September 8, 1988

- Resolution:** Adopted the classification and compensation plan establishing a list of classified positions and a salary range for each position.
- Motion:** Directed staff to update the Authority's Earthquake Emergency Plan and to take a leadership role in earthquake emergency preparedness.
- Motion:** Took a position of support on Ballot Propositions 82 and 83.
- Resolution:** Authorized the Water Reclamation Technical Assistance Program and approved Work Order 11-59 appropriating \$300,000 from the Capital Outlay Fund.
- Resolution:** Authorized the execution of and established reclaimed water rates to be charged by the Authority pursuant to the Joint Participation Agreement with Metropolitan Water District and Fallbrook Sanitary District.
- Motion:** Approved the hosting of the 1988 Statewide Water Awareness Week Workshop at a cost of between \$800 and \$900.
- Motion:** Approved the co-sponsoring of the 1988-89 AIMS (Activities that Integrate Mathematics and Science) Workshops at a cost of between \$3,500 and \$5,000.

October 13, 1988

- Resolution:** Authorized the General Manager to enter into a contract with L.H. Woods & Sons, Inc. to rehabilitate the Shepherd Canyon Pipeline and appropriated \$2,623,800 for Revision No. 1 to Work Order No. 1-71 which is reimbursable by the City of San Diego.

SAN DIEGO COUNTY WATER AUTHORITY

- Resolution: Approved Revision No. 2 to Work Order 1-22 for the relocation of the La Mesa-Sweetwater Extension at Highway 54.
- Motion: Accepted and filed the 1987-88 Audited Financial Statement.
- Motion: Approved Technical Assistance Program funding for the San Luis Rey/Santa Margarita Water Reclamation Planning and Development Study in the amount of \$46,020 and authorized the General Manager to enter into an agreement with each of the participating agencies and Boyle Engineers.
- Resolution: Determined that Olivenhain Municipal Water District is supplying water to certain territory which also lies within the boundaries of the City of San Diego.
- Motion: Approved the request by ACWA for \$574.50 for the funding of a Public Affairs Manager with the understanding the excess monies collected would be used for the Public Affairs Program.
- Motion: Approved the Capital Finance Plan as presented by staff.
- Motion: Took a position of opposition to any amendments to the County Supervisor Association of Southern California Water Policy.

November 10, 1988

- Resolution: Reappointed Directors Griffen, Krauel and Starkey as SDCWA representatives to the MWD Board of Directors.
- Ordinance: Added Section 19 (Standby Charges) to the Administrative Code.
- Motion: Accepted counter offer for Parcel 9 on the Ramona Pipeline.
- Resolution: Instructed the General Manager to enter into a contract with Chilcote, Inc. to construct the Ramona Pipeline and appropriate \$12,800,000 for Revision No. 2 to Work Order 11-46.

December 8, 1988

- Resolution: Extended appreciation to Philip E. Berg upon his retirement from the SDCWA Board of Directors.

BOARD OF DIRECTORS

- Motion: Approved Technical Assistance Program funding for the San Diego River Basin Water Reclamation Planning Study.
- Motion: Approved Technical Assistance Program funding for the City of Poway Water Reclamation Project.
- Resolution: Amended the Administrative Code to provide for the annual review of the performance of the General Manager.
- Resolution: Directed publication of notice of public hearing to consider adoption of an ordinance providing for per diem compensation to Board Members.
- Motion: Directed Legislative Advocate Clay to secure an author and follow the required process to secure approval for legislation to implement the procedure for making cash payments in lieu of standby charges.
- Motion: Authorized the General Manager to execute a contract with James M. Montgomery Consulting Engineers to perform the Optimal Storage Study and to execute an agreement for cost-sharing of the project with MWD.
- Motion: Approved the following organizations as the Water Authority's underwriting team: Prudential Bache Securities – Senior Manager Morgan Stanley & Company – Co Manager; and Stone & Youngberg – Co Manager.

December 14, 1988

- Resolution: Revised the 1988-89 Adopted Budget.
- Motion: Authorized the General Manager to take the following actions: Authorization to implement the SDG&E feasibility study and negotiate the contracts necessary to conduct all related activities at a cost not to exceed \$250,000. Authorization to form an oversight committee to work with the Authority to review and guide development of the study. Authorization to seek an amendment to the Water Authority's authorizing legislation which would explicitly allow the Authority to acquire and operate electric and gas systems.

SAN DIEGO COUNTY WATER AUTHORITY

January 12, 1989

- Motion: Added an urgency item to the Board agenda regarding the bonds submitted by Chilcote, Inc. for the Ramona Pipeline Project.
- Motion: Authorized the expenditure of Authority funds for activities related to the amendment of the County Water Authority Act.
- Resolution: Stated Board's policy on matters related to SDG&E.
- Motion: Approved a 10% increase in the General Manager's salary and five additional management leave days per year, effective January 1, 1989.
- Resolution: Accepted the bonds of Chilcote, Inc. and waived the requirements of Section 32 of Specifications 242 for the Ramona Pipeline.
- Motion: Took a position of opposition to the Riparian Preservation legislation in the form presented and requested that SANDAG establish guidelines for the establishment of a trust fund.
- Motion: Authorized the General Manager to seek an amendment to County Water Authority Act Section 5(11) regarding preferential rights.
- Motion: Approved the hiring of CLS Design for the preparation of a new Water Authority logo.
- Motion: Authorized the hiring of the firm of Best, Best and Kreiger as special counsel for review of draft agreements or contracts for the San Luis Rey Settlement/All American Canal legislation negotiations.
- Motion: Approved the addition of the firm of Grigsby, Branford & Company to the Water Authority underwriting team.
- Resolution: Approved Work Order 1-200 for the SDG&E Feasibility Study.

BOARD OF DIRECTORS

February 9, 1989

- Ordinance: Approved per diem compensation for Directors of the SDCWA Board, to become effective in 60 days.
- Resolution: Approved Revision No. 1 to Work Order 11-48 for the design and installation of an aqueduct water quality monitoring system. Also authorized the General Manager to execute a contract with Systems Integrated for the design, acquisition and installation of the system.
- Motion: Approved the settlement with Southern Distributors Corporation and University Mechanical.
- Resolution: Authorized the General Manager to negotiate with Ramona Municipal Water District to store water in Lake Ramona.
- Resolution: Approved adding Article 20—Equal Employment Opportunity/Affirmative Action to the Administrative Code and amended Section 2.1(d).
- Motion: Approved in concept the General Manager's recommendation for a \$10.00 per acre or per parcel standby fee.
- Motion: Approved the Request for Proposals for external audit services and the formation of a subcommittee to review the proposals and the audit function.
- Motion: Authorized the General Manager to proceed with arrangements to sell Certificates of Participation in the fixed rate market on a negotiated basis in the initial amount of \$140 million.
- Motion: Terminated the CCBA study and commended the members of the San Diego Region Water Reclamation Agency.
- Motion: Took a position of support on SB 52.
- Motion: Took a position of support on SB 53.
- Motion: Approved Water Authority membership in the California Municipal Utilities Association.

SAN DIEGO COUNTY WATER AUTHORITY

Resolution: Replaced Resolution 89-1 (Adopted 1/12/89) and provided Water Authority funds for the SDG&E Acquisition Feasibility Study in the amount of \$940,000 with the provision that any amount over \$255,000 be approved by the Board officers.

Motion: Approved the revised list of Objectives submitted by staff.

March 9, 1989

Motion: Authorized General Counsel to file a suit to establish and enforce the Authority's legal rights concerning three encroachment problems.

Motion: Authorized the General Manager to execute an agreement with the Daley Corporation for the construction of Alternative 3 for the Ramona Pipeline as presented by staff.

Motion: Approved a water rate of \$40 per acre foot effective July 1, 1989, confirmed the treated water rate of \$7 per acre foot for 1989-90 and adopted the rate schedule presented by staff.

Motion: Approved the submittal of the funding proposal to MWD for a San Diego Turf Audit Project funded through the Financial Incentives for Water Conservation Program.

Resolution: Amended Section 17.2 of the Administrative Code regarding the Employees Association.

Resolution: Amended Section 14.2 of the Administrative Code to increase the petty cash fund.

Motion: Approved the selection of Mr. Ergun Bakall as the Authority's new Chief Engineer, pursuant to Administrative Code Section 3.3.

Motion: Instructed the General Manager to prepare an analysis of the engineering issues involved with integrating a groundwater source into the aqueduct system and to prepare a draft agreement for Board consideration.

Motion: Authorized the General Manager to enter into an agreement with the Ramona Municipal Water District for installment purchase of water and repayment of power costs at a 7½ percent interest rate.

BOARD OF DIRECTORS

Motion: Approved a position of support on AB 325 (Clute) regarding xeriscape ordinances.

Motion: Instructed the Water Authority Reclamation Advisory Committee to evaluate the reconsideration of CCBA funding.

Resolution: Approved Work Order 1-210 appropriating \$940,000 from the General Fund for CWA funding of SDG&E activities and other policy matters.

Resolution: Instructed the General Manager to enter into a Memorandum of Understanding with the City of San Diego regarding the proposed merger of SDG&E and Southern California Edison.

Resolution: Concurred in the nomination of H. Warren Buckner to the Office of Vice President, A. Spencer Lehman to the Executive Committee and Ferd Preuss to the Executive Committee of ACWA.

April 13, 1989

Motion: Approved Technical Assistance Program funding for the City of Carlsbad Water Reclamation Master Plan.

Motion: Authorized the General Manager to enter into a Joint Participation Agreement with the Metropolitan Water District and the City of San Diego.

Motion: Approved the Summer Conservation Plan presented by staff with a budget of \$230,000.

Resolution: Set the standby charge schedule proposed to be established by ordinance and fixing the time and place of hearing and giving notice of the hearing.

Motion: Authorized the purchase of the Finance Computer System.

Motion: Reconfirmed the issuance of \$140 million of bonds subject to reconsideration of the rate if higher than 7.75 percent.

Resolution: Added Article 21 to the Administrative Code relating to encroachment permits and approved a budget of \$350,000.

SAN DIEGO COUNTY WATER AUTHORITY

- Motion: Took a position of support on SB 312 (Boatwright) and SB 632 (Bradley).
- Motion: Approved the appointment of a Blue Ribbon Committee to review the final report on the SDG&E Acquisition Feasibility Study.
- Motion: Approved a position of support on AB 903 (Killea).
- Motion: Took a position of support on 1990 Federal funding for the Colorado River Basin Salinity Pollution Control Program, 1990 Federal funding for the National Weather Service Colorado River Flood Warning System, and 1990 Federal funding for the U.S. Bureau of Reclamation's Atmospheric Water Resources Management Program.

May 11, 1989

- Resolution: Honored Craig Andrews upon his retirement from the Board of Directors.
- Motion: Authorized the General Manager to execute a contract with the H.P. Meek Company to provide right-of-way appraisal services for the Pipeline 5 Extension in the San Marcos area.
- Motion: Approved the model water reclamation ordinance and instructed staff to assist reclamation planning agencies in the County with adoption and implementation of its provisions.
- Motion: Approved Technical Assistance Program funding for the City of Escondido's Water Reclamation Market Assessment and authorized the General Manager to enter into an agreement with the City of Escondido.
- Resolution: Took a position of support on AB 1312, The Water Reclamation Bond Law of 1990.
- Resolution: Took a position of opposition to SB 669 regarding water softening devices.
- Motion: Accepted the Contract of Purchase offer from the Underwriters for the \$140 million Water Revenue Certificates of Participation Series 1989A if the effective interest rate is in the 7½ percent target range.

BOARD OF DIRECTORS

- Resolution: Authorized the execution and delivery of a contract of indebtedness, an installment sale agreement, a trust agreement, a contract of purchase and an official statement and approved the distribution of a preliminary official statement in connection with Water Revenue Certificates of Participation, Series 1989A and certain other actions in connection therewith.
- Resolution: Provided for the allocation of water system revenues and established covenants to secure the payment of obligations payable from net water revenues.
- Resolution: Amended the Statement of Investment Policy and authorized the General Manager to sign the agreement with Prudential Bache for non-compensated services in placing a Guaranteed Investment Contract through the bidding process for moneys from Certificates of Participation, Series 1989A.
- Motion: Instructed the General Manager to set aside \$50,000 to disassemble and crate the CCBA facility, place the material in storage and use any unused portion of the funds to assist in transporting the materials and for preliminary costs of a new program.
- Motion: Approved the new Water Authority logo presented by the Logo Subcommittee.
- Motion: Authorized the General Manager to sign a contract with Arthur Young and Company for independent audit services covering fiscal year 1989-90, with a ceiling amount of \$20,400.

June 8, 1989

- Motion: Approved the firm of HHK Associates to produce two water reclamation brochures and authorized the General Manager to enter into a contract with HHK Associates to conduct the work at a cost not to exceed \$20,790.
- Motion: Approved Technical Assistance Program funding for the Otay Water District's SWRCB Loan Application planning documents and authorized the General Manager to enter into an agreement with the Otay Water District.

- Motion:** Approved the request from the Association of Water Reclamation Agencies to co-sponsor the Water Reclamation Symposium IV with a \$500 contribution and provide the staff support requested.
- Resolution:** Adopted the revised Administrative Code in its entirety.
- Motion:** Directed General Counsel to draft an amendment to the Administrative Code to establish an operational surcharge for rejected water for adoption at the July Board meeting.
- Resolution:** Authorized bank signatures for the Authority's bank accounts.
- Resolution:** Approved and established the Water Authority budget for fiscal year 1989-90.
- Resolution:** Added Section 2.13(d) – Payment of Per Diem incurred on Authority Business and Section 19.2(n) – Water Reclamation Advisory Committee, to the Administrative Code.
- Motion:** Authorized the General Manager to execute the agreement with the City of Poway for the delivery of treated water to Ramona Municipal Water District.

June 29, 1989

- Resolution:** Found that there is not substantial evidence that the proposed water standby availability charge and proposed increase in water rates will have significant effect on the environment and approved a negative declaration for such charge and increase.
- Resolution:** Overruled objection to the proposed water standby availability charge and approved adoption of such charge.

WATER AUTHORITY COMPOSITION**General**

The San Diego County Water Authority consists of six cities, three water districts, two irrigation districts, ten municipal districts, one public utility district, one federal agency, one county water district, and the County of San Diego as an ex officio member. 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 908,069 acres (1,418.9 square miles), a net increase of 435 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 210,717 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. The statement was filed with Metropolitan Water District, the San Diego County Assessor, and the State Board of Equalization on December 31, 1988.

The statement for calendar year 1988 contained one annexation 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

On April 1, 1989, the population of San Diego County was estimated to be 2,418,176 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 1989 was 3.97 percent. The population within the Authority service area was estimated to be 2,346,208 on April 1, 1989, an increase of 92,992 or 3.5 percent from the April 1, 1988 estimate of 2,253,216. Population statistics are contained in Tables 2 and 3.

The City of San Diego, largest member agency of the Authority in area, leads the member agencies in population with 1,086,600 persons, approximately 46 percent of the Authority total. De Luz Heights Municipal Water District has the smallest population with 384 and the lowest density of 0.03 persons per acre. The highest population density within an agency is 9.13 persons per acre in the City of National City.

The average population density of the Authority increased during the fiscal year from 2.48 to 2.58 persons per acre or 1,654 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

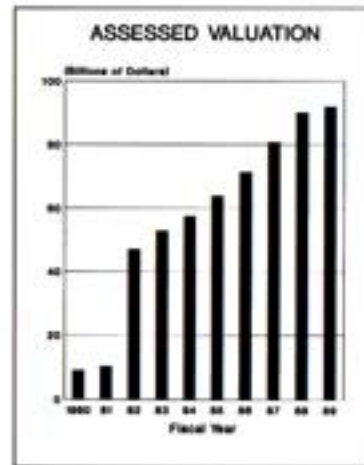
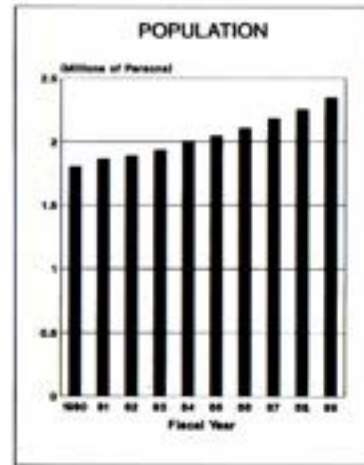
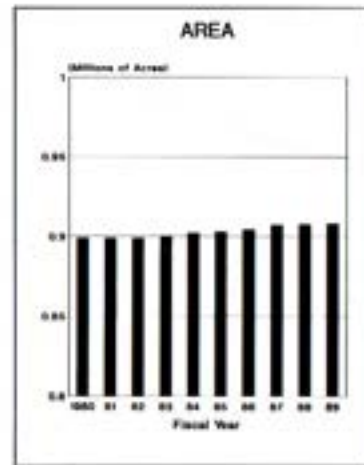


Figure No. 3

number of directors and the number of votes to which each member agency is entitled is 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 1988-89, according to the County Auditor's certification, was \$91,992,977,704, an increase of \$1,999,247,001 or 2.2 percent from the 1987-88 certified valuation of \$89,993,730,693.

The average assessed valuation of property within the Authority service area increased from \$99,152 per acre in 1987-88 to \$101,306 per acre in 1988-89. 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. The member agencies of the Water Authority used approximately 28.1 percent of MWD's supply in 1988-89. The Authority has a preferential right to 11.94 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 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 1989, the blend in Lake Skinner was 51 percent Colorado River water and 49 percent State Water Project water.

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



Mission Valley Flume Line - Circa 1925
San Diego Historical Society - Ticor Collection

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 Buena Colorado Municipal Water District and the City of Oceanside.

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 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 capabilities of the Authority pipelines at the point of delivery from the Metropolitan Water District are:

Pipelines 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 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 acre foot for the maximum amount of water in storage each year. In addition, the Authority pays the City of San Diego \$4.00 per acre foot 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 acre feet 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 acre foot 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 acre foot 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 in Escondido, where delivery requests from member agencies are received. Aqueduct flows and deliveries are monitored and controlled through a computer and telemetering system. Communications 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 597,117 acre feet from MWD during the fiscal year. Untreated water accounted for 400,918 acre feet, and the balance of 196,199 acre-feet of water was treated at the Skinner Treatment Plant in Riverside County. The total flow of 597,117 acre feet was 44,276 acre feet more than the previous fiscal year which represents an 8.0 percent increase. The lowest flow rate averaged 526 cubic feet per second (cfs) in January 1989. The highest average delivery of 994 cfs occurred during July 1988. The average for the entire year

was 825 cfs. Water deliveries to member agencies and others during the fiscal year are shown in Table 8. Purchases by member agencies totaled 582,012 acre feet. Annual water sales to individual agencies for the eight-year period 1981-82 through 1988-89 and total water sales from 1947-1989 are shown in Table 7.

Capital costs for the First and Second Pipelines have been financed by the United States Government. The Third and Fourth Pipelines were financed by 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 California First Bank under Section 8 of the Water Authority Act and accrued reserves from general purpose revenues, including property tax allocations from the County of San Diego, from the one percent general purpose levy. The tax revenues from assessed valuations of property within the Authority for fiscal year 1988-89, as determined by the County Assessor, was set at \$.00403 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 annually 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 rate since 1986-87 has remained at \$197 per acre foot.

The MWD rate for untreated, non-interruptible water for municipal and industrial use was \$197 for 1988-89 to which was added the Authority's surcharge of \$20 and \$25 per acre foot for the periods of July 1, 1988 to December 31, 1988 and January 1, 1989 to June 30, 1989 respectively. Treatment charges by MWD at the Skinner Treatment Plant were \$33 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 1988-89 was \$40 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	—
7/01/81	7/01/82	96.00	9.00	105.00	35.00	70.00	70.00
7/01/82	7/01/83	114.00	10.00	124.00	35.00	89.00	89.00
7/01/83	12/31/83	144.00	10.00	154.00	44.00	110.00	110.00
1/01/84	7/01/84	197.00	10.00	207.00	44.00	163.00	163.00
7/01/84	7/01/85	197.00	10.00	207.00	44.00	163.00	163.00
7/01/85	7/01/86	192.00	10.00	202.00	44.00	158.00	158.00
7/01/86	7/01/87	197.00	10.00	207.00	44.00	163.00	163.00
7/01/87	12/31/87	197.00	10.00	207.00	44.00	163.00	163.00
1/01/88	7/01/88	197.00	15.00	212.00	44.00	168.00	168.00
7/01/88	12/31/88	197.00	20.00	217.00	44.00	173.00	173.00
1/01/89	7/01/89	197.00	25.00	222.00	44.00	178.00	178.00
7/01/89	7/01/90	197.00	40.00	237.00	44.00	193.00	193.00

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 period 7/1/82 to 7/1/83; \$28.00 for the period 7/1/83 to 7/1/84; \$32.00 for the period 7/1/84 to 7/1/86; and \$33.00 for the period 7/1/86 to 7/1/90 must be added to the above rates for treated water deliveries to the Authority from MWD.

SAN DIEGO COUNTY WATER AUTHORITY
WATER PRODUCTION

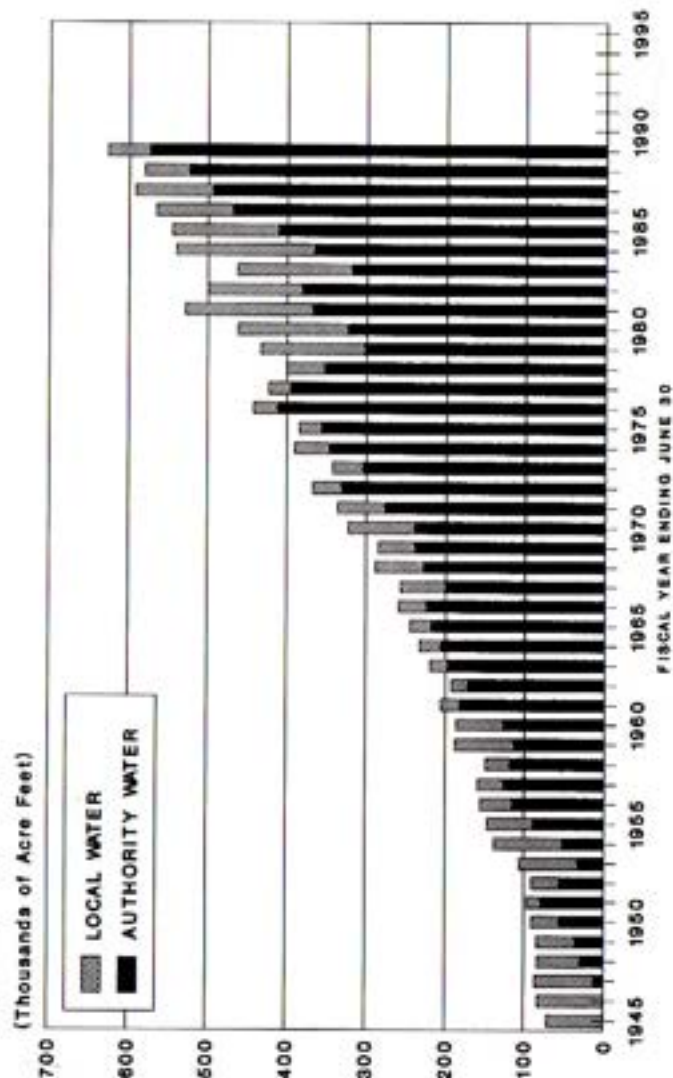


Figure No. 5. Water Production of Authority Member Agencies

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 qualifies for the municipal and industrial interruptible rate was 120,000 acre feet.

Ramona Storage Agreement

In April of 1989 an agreement was entered into between the Authority and the Ramona Municipal Water District. The purpose of the agreement is to increase the amount of water in storage which can be used to help meet maximum day demands of the aqueduct. Under the terms of the agreement the Authority will deliver and the Ramona Municipal Water District will purchase up to 2,500 acre-feet of water to be stored in Lake Ramona. In order to encourage Ramona to purchase this water the Authority agreed to permit Ramona to pay for the water on an installment basis as provided for in the agreement. The Authority can request Ramona to draw upon this stored water during times of peak water use in order that the Authority may meet the peak demands of other 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 1987-88, the total water production was 580,152.7 acre feet. The water production for the current year 1988-89 is 626,502.0 acre feet which is an increase of 46,349.3 acre feet or 8.0 percent. The highest monthly production occurred during July 1988 when 68,979.5 acre feet were used. This was less than the record high month of August 1986 when 72,930.3 acre feet were used. The lowest monthly production occurred during February 1989 when 31,771.6 acre feet were used. The Authority supplied a high of 95.4 percent of the water production during the month of April 1989 and 91.7 percent of the production for fiscal year 1988-89.

Rainfall for 1988-89 was below normal as shown below:

Location	Rainfall	Percent of Normal
Lindbergh Field	5.38 inches	58%
Lake Cuyamaca	19.47 inches	52%
Lake Henshaw	16.36 inches	63%

Local and imported water stored in regional reservoirs decreased from 294,350 acre feet on June 30, 1988, to 274,410 acre feet on June 30, 1989 which is a decrease of 6.8 percent.

The City of San Diego maintains the most extensive system of impounding reservoirs in the Authority service area. This system produced 16,274.5 acre feet during the fiscal year, and out of this, the City of San Diego sold 5,381.0 acre feet to the California-American Water Company for delivery to Coronado and Imperial Beach. Helix Water District produced 4,177.7 acre feet from Lake Cuyamaca and its wells in the El Monte Basin. The Vista Irrigation District (part of the Bueno Colorado Municipal Water District) produced 8,440.6 acre feet from Lake Henshaw and the Warner Ranch wells. The City of Escondido produced 6,523.5 acre feet from the Henshaw-Wolford system, and 2,346.1 acre feet were produced within Yuima Municipal Water District from the Pauma Valley wells. Sweetwater Authority produced 6,616.0 acre feet 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 96.8 percent (De Luz Heights) to 38.7 percent (Yuima Municipal Water District) dependence on water from the Authority.

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 1988-89 was 195 gallons per day. This is an increase from the 189 gallons per capita per day of last year. It is estimated that the Authority serves approximately 49 percent of the geographical area within its boundaries.

The combined water production of Authority member agencies is shown in Figure 5. The unshaded area indicates the proportion obtained from local sources compared with that supplied by the Authority.

Water Quality

The general quality of water entering the Authority system remained good. 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 0.8 to 3.0 Turbidity Units (TU).

Algae growth in Authority pipe-

SOURCE OF WATER

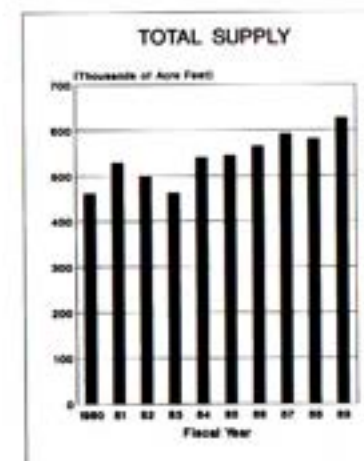
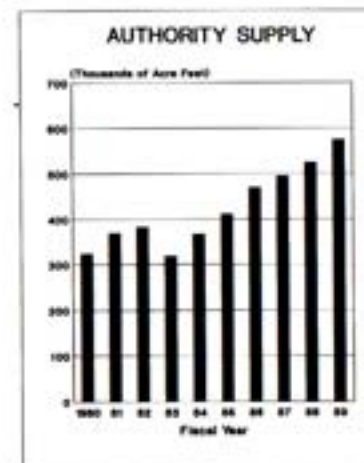
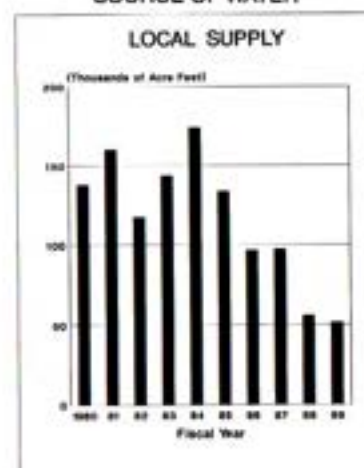


Figure No. 6

lines 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 the West Portal of San Jacinto Tunnel and treated by MWD. Total hardness ranged from a high of 293 milligrams per liter (mg/l) to a low of 268 mg/l. Water temperature varied from a high of 79°F (26°C) in August 1988 to a low of 50°F (10°C) reported in February 1989.

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 79°F (26°C) recorded in August 1988 to a low of 54°F (12°C) in January 1989.

Agricultural Water Use

Agricultural water use by member agencies of the Authority during 1988-89 was 115,175.4 acre feet which is 12,753 acre feet more than the previous year's use of 102,422 acre feet. The percentage of agricultural water to the total water production was 18.4 percent, an increase from 17.7 percent in 1987-88. About 95 percent of water used for agricultural purposes is supplied by the Authority while only 92 percent 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 production. For example, Rainbow Municipal Water District uses approximately 84 percent of its water for agricultural purposes but it has no local production. 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 6.7 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, provides 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 (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 Otay Water District, 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 1991. This treated water is disinfected by the relatively new chloramination method which introduces ammonia and chlorine into the water and reduces the formation of trihalomethanes (THM). The termination of a filtered water line at Escondido, presents serious operating problems that will require modification of existing facilities.

The Water Authority, as agent of water districts in North County served from the First Aqueduct, measures and reports aqueduct water turbidity to meet the California Safe Drinking Act daily monitoring requirements. The results of additional water quality sampling and measurement by Authority member agencies are collected for a more complete daily water quality record.

Allocation of Water to Member Agencies

The County Water Authority Act (Section 5.11), which provided a preferential entitlement for the purchase of water by each of the Authority member agencies, was amended in 1989. In the event of shortages the amendment requires that the Board of Directors adopt reasonable rules, regulations, and restrictions so that the available supplies are allocated among its member agencies for the greatest public interest and benefit.

The Authority's Administrative Code (Section 16.4 and 16.5) 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.

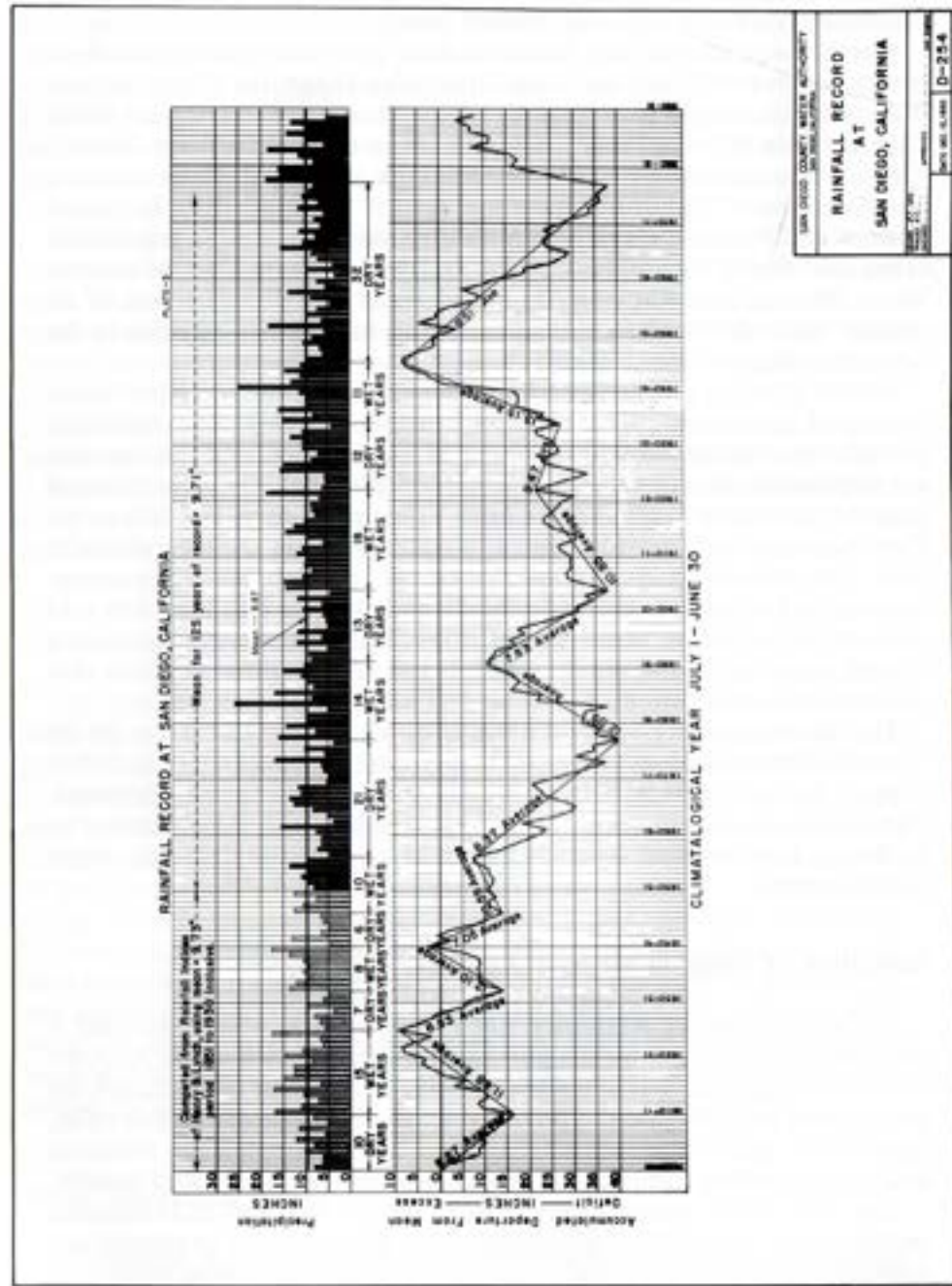


Figure No. 7 Rainfall Record at San Diego, California

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. Nevertheless the Authority recognizes its responsibilities to encourage prudent conservation practices. It is also recognized that there are certain acts of nature against which there is no defense available within reasonable economic bounds.

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

The Water Authority obtains all of the water it distributes from the Metropolitan Water District of Southern California which has two sources of supply: The Colorado River and the State Water Project. Population forecasts indicate that MWD's population will increase from the present 14.5 million to 16 million, and the Authority's population will increase from the present 2.35 million to 2.70 million 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

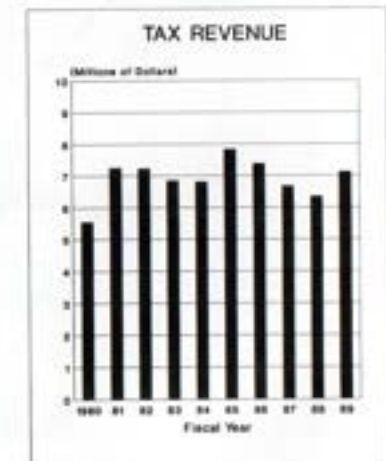
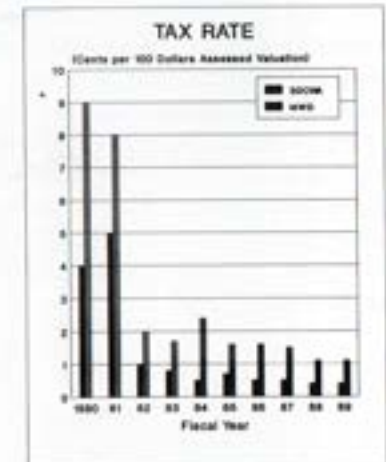
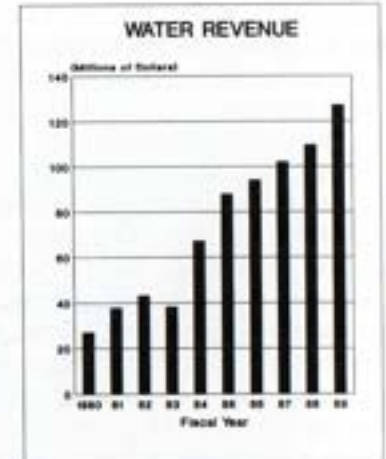


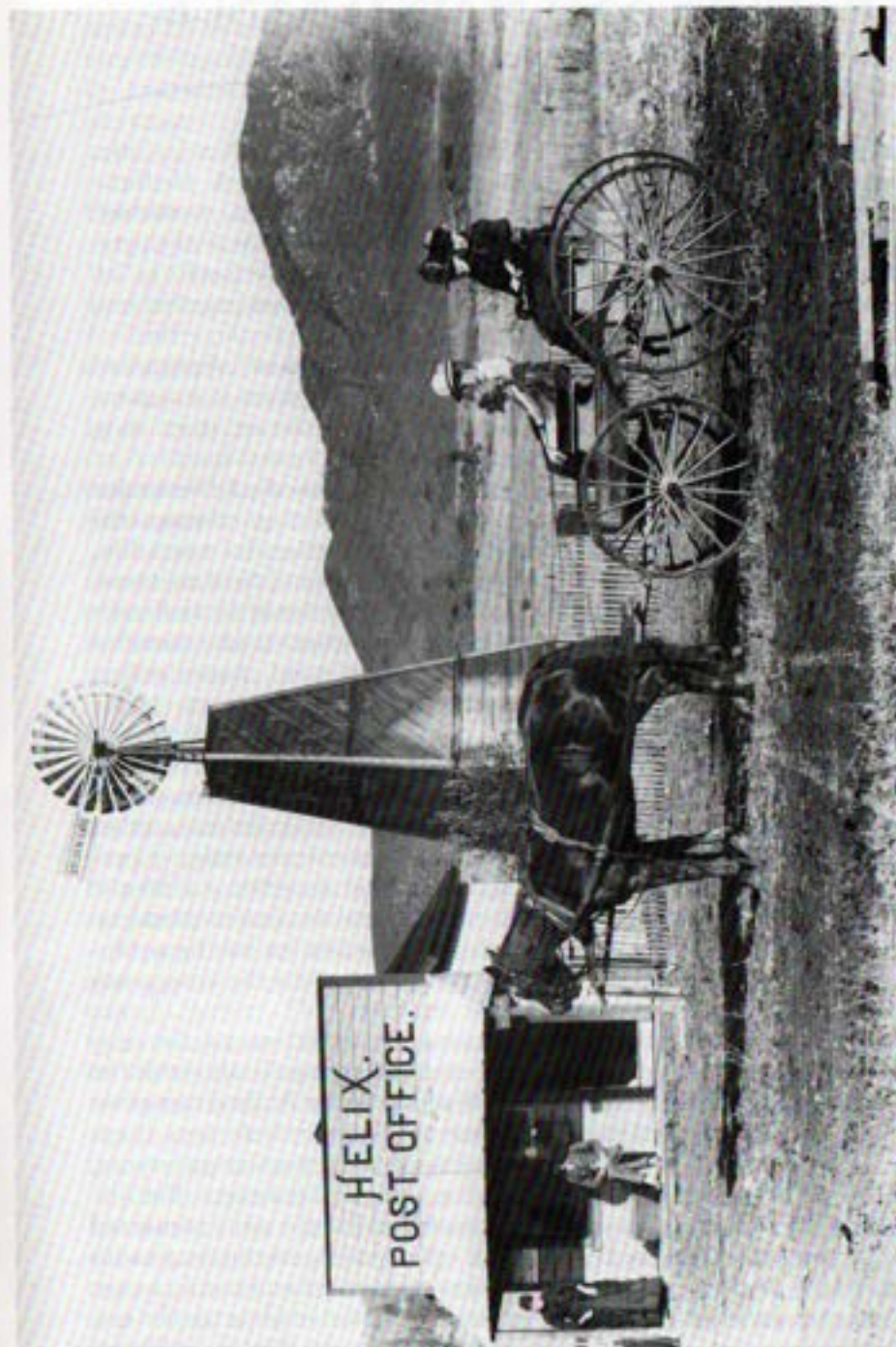
Figure No. 8

1,212,000 acre feet because of the U.S. Supreme Court's decision in *Arizona vs. California* in 1964, MWD amended its contract with the State to provide an additional 500,000 acre feet per year. Annexations and other changes have increased that MWD-State contract to 2,011,500 acre feet 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 1990's. The Authority, MWD, the State of California, various federal agencies, and many private organizations are presently conducting investigations of feasible alternate water sources and on ways to increase the present yield of the State Water Project. Water reclamation and water conservation are being aggressively pursued as both an alternative water source and as a means of augmenting current water supplies. 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 Otay Water District's plans to supply reclaimed water to irrigate parks, golf courses, and open space in a planned residential development.

Figure 5 shows the increase in water requirements within the Authority since 1940.



Water Well-Spring Valley-Helix Post Office - Circa 1888
 Located in present-day Casa de Oro, about the northeast corner
 of Campo Road and Conrad Drive
 San Diego Historical Society - Ticon Collection

OPERATIONS 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 W. Fifth Avenue, Escondido, California. As of June 30, 1989, the Authority has an operation and maintenance force of thirty-nine. They operate the aqueduct system and normally perform all maintenance and repair of the aqueducts, as well as construction and modification of metering and control buildings.

Three Assistant Superintendents for Operations, Technical Support, and Maintenance, supervise eight system operators, seven system technicians, and a maintenance force of twenty-one, a storekeeper-buyer, three shop mechanics and a three-man construction crew.

The Fred A. Heilbron Operations Center is composed of five major buildings, that occupy one city block. The main building contains the aqueduct computerized telemeter control system and offices for operation, maintenance, technical service, construction personnel and field engineering. A shop building has facilities for the repair and service of all Authority vehicles and heavy equipment and steel fabrication work. It also contains a small machine shop, meter shop, and equipment maintenance office. Materials, supplies, tools, and small equipment are stored in warehouse storerooms. A section of the warehouse is used for valve repair and carpentry work. The warehouse is also used for equipment and vehicle security. A training center building contains two classrooms equipped for waterworks technology training. This building is used for employee assemblies, in-house training as well as an active area-wide waterworks training program for the benefit of all San Diego County water agencies. An on-site resident increases security and provides night-time assistance to the aqueduct system operators. The resident is also responsible for having equipment ready for the emergency response crews thus reducing emergency response time.

A dual radio system with four frequencies and two different radio relay sites on Palomar Mountain connects the Authority's base stations at the Operations Center with the San Diego office, 42 Water Authority mobile units, Metropolitan Water District's Robert A. Skinner Treatment Plant in Riverside County, all of the major San Diego County water purveyors, and all aqueduct connected water treatment plants. In the event that one or both relay stations fail, they can be bypassed and radio units contacted directly. A touch tone call system can call up a specific interagency radio independently. Vehicles assigned to eight key operations and maintenance employees and management personnel are equipped with mobile telephones.

A standby generator supplies emergency power for the Fred A. Heilbron

Operation Center's control room as well as the offices and shops. The aqueduct system control, radios, and telephone system have a separate uninterruptible power supply and emergency generator. The larger standby generator can also be used as a backup power supply for these critical activities.

Operations

The Operations Center control room is staffed every day, including weekends and holidays from 7:30 a.m. to 4:00 p.m. During off-hours, Water Authority phone calls are transferred to the home of the systems operator on duty, who has a combination Authority and interagency mobile radio. A pager will notify the duty operator if telephone contact cannot be made. In emergencies the duty operator is assisted by the Superintendent, and the Assistant Superintendents for Operations, Technical Support, and Maintenance, who also have interagency radios at home for quick response and field coordination with other agencies.

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

Flow into both the treated and raw water aqueducts is controlled either locally or remotely by the Metropolitan Water District at the Robert A. Skinner Treatment Plant Operations Center. The plant operates round-the-clock and can respond to requests for emergency flow changes. Normally aqueduct flow changes are made at 8:30 a.m. and 2:30 p.m. each day for the convenience of the treatment plant operations. At other times flows are usually shifted from one service connection to another, with agency approval, to keep the pipeline flow in balance.

Most of the metered water deliveries in the aqueduct system are displayed and controlled 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 nighttime duty operator by telephone. The nighttime operator can also monitor and instruct the computer control system from home by telephone using special portable equipment. A security system of lock out and codes prevents misuse of the computer control equipment.

The aqueduct system in San Diego County is gravity fed and therefore 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 pipelines. The computer and a large aqueduct flow status board display the amount of water available to meet the member agencies' needs. Each pipeline's current flow,

requested flows, meter sizes, maximum allowable capacity flows, critical pipeline flows, telemeter and valve information are displayed on the status board, and computer terminals.

An aqueduct operations van is equipped so that it can function as a mobile emergency operations center to monitor radio, telephone, and certain telemeter functions.

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

The Bueno Colorado Municipal Water District, the Helix Water District, and the City of San Diego have service connections through which small flows of treated water can be put into the aqueduct when needed.

Three pumps at the Authority's Miramar pump station are available to pump high flows up to 140 cfs of treated water from the City of San Diego's Miramar treatment plant into the treated water aqueduct for delivery to the City of San Diego and other agencies' service connections south of that point. Except for short periods of time, 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.

Operational Activities

The aqueduct operations control center room was rearranged, and a custom-made control desk and console installed.

On July 5, the Miramar power plant computer did not respond properly to a power line problem and caused the plant to shut down. Much of the rejected water spilled at the Miramar vent, causing traffic problems at Black Mountain Road. The controller has now been programmed to properly respond to this type of failure.

On July 9, MWD's Red Mountain power plant shut down and the bypass valve failed to open, causing Pipeline No. 5 to shut down. The Crossover was taken out of service until the flow at MWD could be resumed by resetting a valve, manually, while minimum demand flows were maintained in the parallel Pipeline No. 3.

On November 9, a large hole in the State Water Project East Branch caused a shutdown of State Water delivery to Perris Reservoir and Lake Skinner. Storage water to San Vicente and Sweetwater Reservoirs were shut off for one week to reduce the demand on the Colorado River Aqueduct.

On March 3, a concrete side panel of the MWD San Diego canal collapsed across from the Lakeview Pipeline intersection. The canal was repaired and back in service by Tuesday, March 7. During the shutdown the fifth Pipeline flow was cut and the First Aqueduct flow increased to the maximum to reduce the draw on Lake Skinner.

On March 22, 1989 the Red Mountain power plant suddenly went off line and sent a surge of 58 cfs down the pipeline.

On March 27, 1989 MWD ended its in lieu program for the year which put water into San Diego County reservoirs under MWD storage accounts during winter months for subsequent summer use. Water going into Sweetwater was shut off while the City of San Diego agreed to continue to buy water for San Vicente Reservoir.

On March 26, 1989 water quality problems at the MWD's Skinner Treatment Plant forced MWD to change from Plant No. 1 to Plant No. 2 and take the clearwell reservoir out of service. With the Skinner plant clearwell reservoir out, spills occurred at the Navajo Road vent, the Miramar vent and at least two Camp Elliott vents. Surges of 40 to 50 cfs were common, and the Navajo vent continued to spill every 35 to 40 minutes. Employees were kept at the vent for over 13 hours, to be certain that others were aware of the problem and hazards, and to hold the damage to a minimum. The aqueduct pressure control station was opened wide to relieve some of the surging. The Skinner Treatment Plant clearwell reservoir was put back in service late the next day and the spills stopped. All of these surging and spilling problems occurred while coping with serious water quality problems. For more than 30 hours over half of the Authority systems operators were working at any given time.

Erratic and rejected flows by water agencies, forced spills at the Miramar and Navajo vents. Both vents are located where serious damage could be caused by large spills. On three consecutive days starting April 6, total aqueduct flows went over 1,100 cfs. This was the first time aqueduct flows have exceeded 1,100 cfs before July.

On Thursday, May 25, the Tijuana Aqueduct from the Colorado River failed on a section of about 72-inch diameter pipeline that connected a storage reservoir with the Tijuana filtration plant. The city, of nearly 1,500,000 people, was served with well water distributed by water trucks. During the night of May 25, the Otay Water District reconnected the Authority's water lines to feed the Tijuana system at the border. By mid-morning Tijuana was ready to take emergency flows. Up to 20 cfs was delivered until June 2, for a total of about 250 acre feet.

The Fallbrook No. 3 service connection which had been out of service for nearly three years was put back in operation.

Padre Dam Municipal Water District tested the new pump installed at its Padre Dam No. 6 meter. This meter provides water to Padre's system from the Helix filtration plant through an Authority service connection. A peak flow of 27 cubic feet per second was recorded.

A flow test showed that Pipeline No. 5 is capable of delivering 500 cfs. The design capacity is 450 cfs.

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. Satellite maintenance yards are located as far away as 60 miles. Field offices may be set up for outlying major construction projects, in Authority office trailers, or large combination construction trailers with desks, work benches and a locked storeroom.

Maintenance activities include service, repair and maintenance of the Fred A. Heilbron Operations Center, its buildings, shops and yard; about 222 miles of major pipelines; 130 miles of right-of-way; 109 miles of Authority roads; 72 control buildings with meters, automatic valves, and electronic control equipment; a large chlorine station; a pump station containing three pumps with 400 to 1,000 horsepower motors, two hydroelectric plants, each with two turbines and generators, over 900 underground valve vaults, and two material storage compounds, one with a concrete storage building. All control equipment is serviced and repaired in Authority shops or by specially-equipped service trucks.

Maintenance equipment includes two motor graders, a bulldozer, two skiploaders, a backhoe, one 25-ton and two 5-ton cranes, two forklifts, as well as dump trucks, truck tractors and equipment trailers, compressors, generators, welders, an eight inch dewatering pump, and other portable pumps. All pickups and most other trucks are equipped with mobile radios for efficiency and quick response.

The Assistant Superintendent for Maintenance and a maintenance force of 17, plus three mechanics and a warehouse storekeeper normally provide all of the maintenance. They also construct new control and metering facilities, patrol the pipeline rights of way for encroachment and inspect for hazards or potential damage to pipelines or easements.

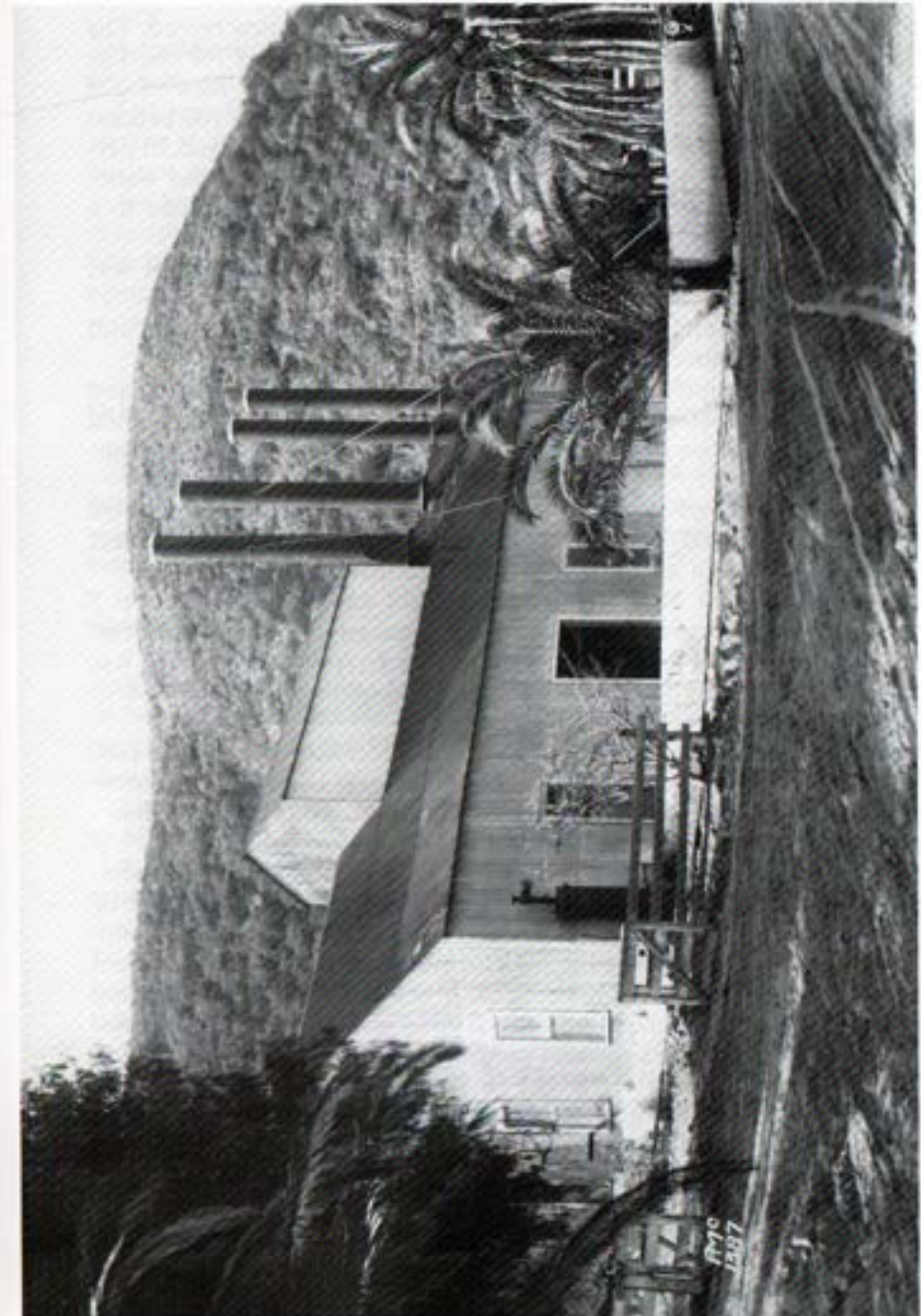
The vehicle shop is open two hours past normal working hours to perform minor repairs and servicing. The shop and warehouse are open during all regular working hours. The maintenance crews have 9 hour work days to reduce travel time associated with work projects.

The pipeline easements and patrol roads are normally checked every week by patrol vehicles. All pipelines are checked by foot patrol twice a year.

Authority technicians perform all the electrical and electronic installations including some electronic design, fabrication, field testing and maintenance.

The Authority continued its policy of participating on a one share basis with local property owners in upgrading or paving aqueduct patrol roads.

The Water Authority is a member of the Underground Services Alert. This service notifies the Water Authority of any excavations within 500 feet of Authority pipelines. The Authority has averaged about 10 calls per day. While many hours are spent responding to these calls, the effort has



*Pump Station, San Diego Water Works - Circa 1918
11th and Beech Streets, City of San Diego
San Diego Historical Society - Teicor Collection*

avoided serious damage to Authority facilities.

For the fifth consecutive year the aqueduct flow sets a new record. The average flow was about 819 cfs, eclipsing last year's record of 761 cfs. The high daily flow was 1,158 cfs on Sept. 6, 1988 and the low flow of 376 cfs occurred on December 23. The First Aqueduct received 100 percent Colorado River Aqueduct water. The Second Aqueduct averaged 70 percent Colorado River Aqueduct water and 30 percent State Project water. The State Project water percentage ranged from a low of 6 percent to a high of 70 percent.

All equipment and piping at the Rainbow chlorination station was dismantled, steam cleaned, and refurbished.

The Miramar pump plant was de-energized in January for repairs and preventive maintenance.

The Authority's pipeline carriages and other equipment for relining and rehabilitation of pipelines were modified in the Authority shop and then used to reline 8,200 feet of the City of San Diego's 72-inch Shepherd Canyon Pipeline.

A total of 514 valve structure lid automatic safety latching devices were fabricated and installed. These safety devices will prevent possible accidents by holding the lids in an upright position until released.

The Carlsbad W.D. No. 3 service connection was flooded with over 5 feet of water when construction in the area created a drainage problem. Metering and control equipment were replaced. A 40-foot culvert was installed to drain around the station, and the building was modified to reduce the possibility of future flooding.

Vibration caused the Alvarado Power Plant control room wall to fail, resulting in serious noise problem. The problem was corrected by removing the metal studded wall separating the control room from the turbines and generators and replacing it with a masonry block wall.

Systems technicians conducted a program to upgrade electrical components at all metering and control stations. This included installation of ground fault interrupters, installation of 30 minute interruptible power supplies and power conditioners for the electronic equipment, replacement of faulty power supplies, and rewiring of valve operator push buttons and indicator lights for standard indication. Also an uninterruptible power supply generator for the aqueduct control room and phone system was installed.

The Miramar vent cover and Navajo vent shroud, which had been forced off by surges of water, were repaired and replaced.

The annual Engineering and Operation Directors' tour included the operations center, shop, and warehouse, the Ramona Pipeline construction project, and proposed new pipeline alignments from Highway 15 to US International University and from Mission Gorge at Highway 94.

The Fallbrook-Oceanside pipeline cathodic protection continues to effectively control corrosion on that pipeline previously plagued by failures.

Force Construction

An additional warehouse loft and office were constructed to make more efficient use of the building.

The new Otay No. 9 service connection was completed and placed in service in September. The Otay No. 3 service connection was completed, but not put in service.

Authority crews dismantled the Coordinated Chemical Bonding and Adsorption (CCBA) experimental waste water treatment process demonstration plant at Padre Dam Municipal Water District's Santee Lakes. The equipment was temporarily stored at the Sweetwater Authority's Sweetwater Lake compound.

Other Construction

The City of Escondido completed construction of the Harding Street Bridge across the Escondido Creek flood control channel, which now provides an aqueduct patrol route over the channel and beyond on the extended Harding Street.

Shutdowns

On December 15, the Colorado River Aqueduct was shut down for over 16 hours to install an electronic control panel at Eagle Mountain pumping plant. Flows in the First Aqueduct dropped from 70 cfs to 20 cfs for about six hours.

The Third Pipeline was shut down for two days starting December 19 at MWD's request.

Authority crews uncovered what appeared to be unstable soil conditions around the Miramar valve vault. As a precaution, on December 5, the No. 3 pipeline valve in the vault at Miramar was closed and the No. 3 pipeline Mission Gorge siphon was drained and inspected. Inspection of the pipeline interior showed no indication of movement or other problems. The inspection was completed on December 7.

MWD shut down the Colorado River Aqueduct on January 10 to install acoustic meter transducers. The San Diego First Aqueduct flow went to zero on January 11. Return flow started on January 12. Also, Pipeline No. 2 was taken out of service from January 17 to February 2 for maintenance and valve replacement.

A section of the Authority's treated water aqueduct was shut off on March 12, 1989 between the Carlsbad No. 1 service connection and the San Diego No. 10 service connection to tie in the new Ramona Pipeline. The aqueduct was refilled on March 15 and 16. During the refilling process, the Navajo vent spilled when a surge of 50 cfs was released.

The Sweetwater branch line was shut down twice on March 29, 1989, to allow a contractor to disconnect the old piping from the Helix Water District line at Jamacha road, then later, to set valves for the new service connections from Helix Water District to the Sweetwater line.

On May 10, 1989, MWD switched to the San Diego Canal to check the outlet tower for taste and odor source. The operation required the shut-down of Pipeline No. 3 for two days.

On May 25, 1989 the Colorado River Aqueduct was shut down at Hines pump plant to replace an electric panel. The following day First Aqueduct flows dropped about 80 cfs to around 112 cfs. Only water going into storage was affected.

On July 9, a failure at the MWD Red Mountain power plant inadvertently caused an unexpected short shutdown on Pipeline No. 5.

DESIGN AND CONSTRUCTION

General

Fiscal year 1988-1989 has been a year of considerable construction activity, and the next few years promise even more. Several projects are approaching construction status as the Authority proceeds through the environmental review and design phases of the one-half billion dollar Water Distribution Plan Capital Improvement program. Major engineering activities during the year follow:

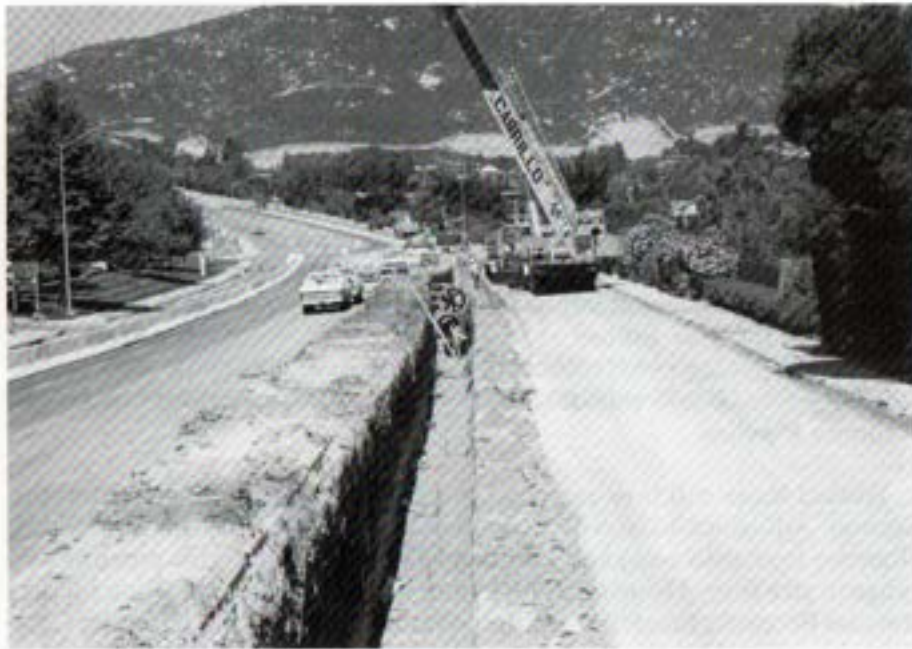
Ramona Pipeline

Treated water will flow easterly through the Ramona Pipeline from the Second Aqueduct to serve Olivenhain MWD, the City of San Diego (Rancho Bernardo area) and Ramona MWD. The eight-mile pipeline will range in size from 57-inches to 36-inches in diameter. The pipeline follows Rancho Bernardo Road through the community of Rancho Bernardo. Considerable time has been spent meeting with citizen groups to assure minimum community disruption during construction.

The firm of Camp, Dresser & McKee completed design of the project in the Fall of 1988 and bids were received by the Authority November 2, 1988. The low bid of \$10,863,832 was submitted by Chilcote, Inc. of El Cajon, and on November 10, 1988 the Board authorized execution of a contract with Chilcote for the Ramona Pipeline construction. Construction began in March 1989 and is continuing ahead of schedule. Completion of construction is expected in early 1990.

Rehabilitation of Shepherd Canyon Pipeline

At the request of the City of San Diego, Authority staff and consultants Linden R. Burzell and Buck Ogden, prepared plans and specifications and provided construction engineering services necessary for the rehabilitation of the City's 72-inch diameter water transmission main. The Shepherd Canyon Pipeline is a prestressed concrete cylinder pipe installed in 1973, and has experienced corrosion failures and is in need of complete relining. Utilizing a technique developed by the Authority of placing steel liner plates inside the existing pipeline, the firm of L.H. Woods & Sons of Escondido completed the 8,200 feet of relining during a three and one-half month winter shutdown. The final construction cost for the project was \$2,491,793.43.



RAMONA PIPELINE PROJECT 1988-89
 Laying over 8 miles of 54-inch to 36-inch diameter pipeline to serve the City of San Diego (Rancho Bernardo area), the service areas of the Ramona MWD and Olivenhain MWD

Water Distribution Plan/Environmental Impact Report

The Authority's Water Distribution Plan lists \$530,000,000 of capital improvements to be constructed over the next ten years. The firm of Brian F. Mooney and Associates was selected to prepare the Program Environmental Impact Report (EIR) for these improvements, specifically addressing the Phase I and Phase II projects. Nearly 50 public meetings have been held throughout the county this past year in an attempt to gather public input and comments relative to such a large undertaking. The Authority's water distribution plan is shown in Figure 9.

The Draft EIR was completed and submitted for public review in April 1989. Public comments have been gathered and were responded to in the Final EIR. The Final EIR was certified during the year and adoption by the Board of Directors is scheduled in August 1989. The Phase I projects are critical to the Authority's delivery system as they will solve present capacity problems and provide pipeline redundancy where needed maintenance is required.

Pipeline 5 Extension – Phase I

This nine-foot diameter pipeline will generally be constructed in the Second Aqueduct right-of-way from the Crossover north of San Marcos southerly to the Paint Mountain area of Elfin Forest. Southeast of San Marcos it will be necessary to construct a 1,600 foot tunnel through Los Posas Mountain. This project is being designed by the firm of Linden R. Burzell and plans and specifications are expected to be ready for bid in January 1990.

Pipeline 4B – Phase I

This eight-foot diameter pipeline will generally be constructed in the Second Aqueduct right-of-way from north of Miramar Reservoir southerly through the Scripps Ranch area to Shepherd Canyon – considerable effort is being expended to insure the route selected through the Scripps Ranch area will minimize community disruption. This eight mile project is being designed by Boyle Engineering Corporation and is expected to be ready for bid in July 1990.

Pipeline 4 Extension – Phase I

This eleven-mile segment of eight-foot diameter pipeline will generally travel from Mission Gorge Road at Jackson Drive to the Sweetwater Reser-

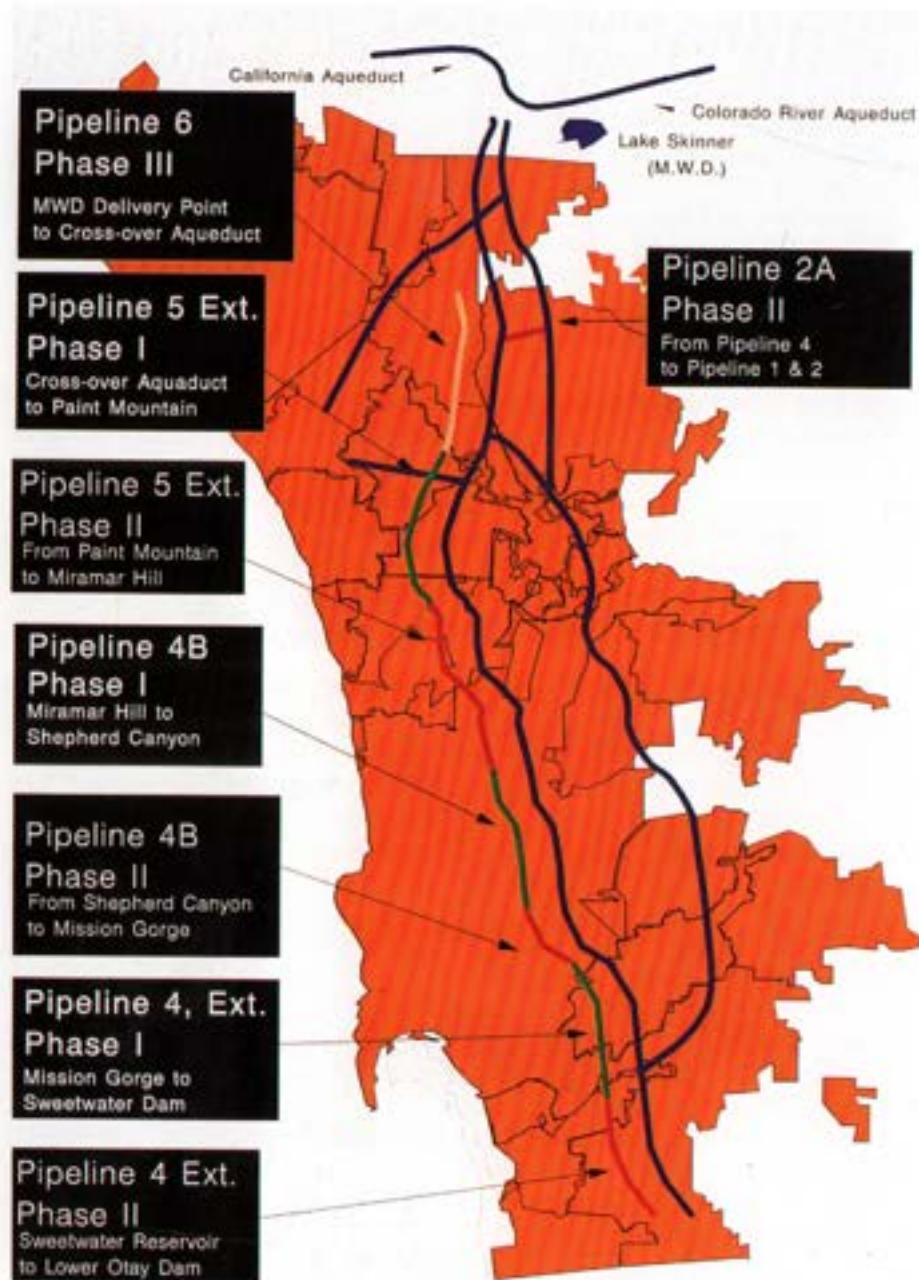


Figure No. 9

San Diego County Water Authority
Water Distribution Improvement Plan
1990-2010

voir area. This is a difficult project because of geological conditions and the problems associated with construction in the established populated areas of La Mesa and Lemon Grove. The project will include several tunnels with the major one being a 7,000 foot tunnel through Cowles Mountain. This project is being designed by the firm of James M. Montgomery and is expected to be ready for construction bids in the fall of 1990.

Pipeline 2A—Phase II

This pipeline is proposed as a northerly crossover to carry additional treated water from the Second Aqueduct to the First Aqueduct service area north of Escondido. The firm of NBS Lowry prepared a feasibility study for this project and presented it in August 1988 to the Authority's north county member agencies. The report outlines interim measures that can be taken if Pipeline 2A were delayed, however, the project is envisioned as a four-mile 42-inch diameter pumped system in the Valley Center area. Additional studies for this pipeline location are planned in 1990 in association with MWD's final alignment selection for Pipeline No. 6.

Pamo Dam and Reservoir

Due to unresolved environmental impact issues and resulting difficulty in securing a Clean Water Act section 404 permit, in August of 1988, the Water Authority requested the U.S. Army Corps of Engineers to suspend the Water Authority's request for a permit for the Pamo Dam and Reservoir project. In order to more fully evaluate the alternatives for needed emergency water storage, including the Pamo site, the Authority authorized the preparation of an Optimal Storage Study. This study will analyze the water storage needs of the Authority and develop recommended alternatives for meeting those needs. In 1990 it is expected that the Authority will develop specific plans for meeting future storage needs of the region.

Other Projects

Some other important engineering efforts for 1988-90 are:

- Meeting with the MWD planning group on the routing and scheduling of Pipeline No. 6 southerly from Lake Skinner.
- Meeting with the South Bay Task Force to develop solutions to the increasing demands on the Authority's aqueduct system south of Interstate 8.

- Working with the Sweetwater Authority to develop a more efficient system for delivering water for storage into Sweetwater Reservoir.
- Working with the City of Escondido to develop a method of delivering water to Dixon Reservoir after the First Aqueduct is converted to treated water in the Fall of 1991.
- Working with CALTRANS on the many new freeway projects that will require coordination with our aqueduct system, attempting to solve the many encroachment problems resulting from the increased development activity in the vicinity of our aqueducts.
- Approving plans to start construction on a new Rincon No. 3 service connection.

WATER RECLAMATION

The Authority anticipates that 12 percent of the water demand for year 2010—100,000 acre feet per year—will be met with reclaimed water. Working towards this objective, the Authority acted upon a number of recommendations of the Water Authority Reclamation Advisory Committee (WARAC) during fiscal year 1988-1989. WARAC is advisory to the Authority on water reclamation matters and is comprised of representatives from water and wastewater agencies, the Farm Bureau, Department of Health Services and Regional Water Quality Control Board.

Model Water Reclamation Ordinance

On May 11, 1989 the Authority Board of Directors adopted a model water reclamation ordinance. The intent of the ordinance is to maximize resource conservation and streamline implementation of reclamation projects by establishing a common set of regulations throughout San Diego County. The model ordinance mandates the use of reclaimed water and establishes a program to protect wastewater quality. It is considered a generic model, to be tailored by public agencies to conform with their rules and regulations. Both the City of Poway and City of San Diego adopted ordinances in fiscal year 1988-89 based on the Authority model.

Technical Assistance Program

During fiscal year 1988-89 five water reclamation projects received funding assistance for planning and development through the Authority's Water Reclamation Technical Assistance Program. The combined reuse potential from these projects and the two projects funded in fiscal year 1987-88 is approximately 40,300 acre-feet a year.

Clean Water Project of Greater San Diego

The Authority has been working closely with the City of San Diego and the fifteen other Metropolitan Sewer System member agencies to ensure that reclamation facilities are included in the selected alternative and are adequately sized and strategically located to meet projected reclaimed water demands. Authority Directors John M. Leach and Michael D. Madigan serve as members of the Metro Sewer Task Force and have been active in the project alternative selection process. Responding to the Authority's reclaimed water production goal of 100,000 acre-feet annually by year 2010,

the City of San Diego has adopted a goal of producing 70,000 acre-feet of reclaimed water by year 2010.

As a focal point for the planning and development of reclaimed water in San Diego County, the Authority provides water reclamation entities with technical expertise relating to reclamation matters and encourages policies which advocate the use of reclaimed water. During fiscal year 1988-89, the following activities were pursued:

- Worked towards regional adoption of the model water reclamation ordinance.
- Educated the public on water reclamation through publications and presentations.
- Served as the administrative agency for Metropolitan Water District's Local Projects Program. The Fallbrook Sanitary District received approval for assistance under this program in fiscal year 1988-89.
- Sponsored a workshop with the State Water Resources Control Board staff regarding water reclamation bond law funding.
- Assisted in the Leucadia County Water District, City of San Diego, Ramona Municipal Water District and Otay Water District with the state loan application process.

Average Reclaimed Water Production

Reclaimed water utilization within the Water Authority service area during fiscal year 1988-1989 is summarized in Figure 10.

AVERAGE RECLAIMED WATER PRODUCTION
Fiscal Year 1988-1989
(Acre Feet)

Location	Facility	M&I	Ag.	Replenish	Total
Fallbrook PUD	Fallbrook SD Plant No. 1	203			203
Olivenhain MWD	Whispering Palms WPCF		134		134
Otay WD	Jamacha WRF	122			122
Padre Dam MWD	Santee WRF	350			350
Pendleton		493		4,964	5,457
Ramona MWD	Santa Maria WPCF		649		649
Ramona MWD	San Vincente WRP		381		381
San Diego, City of	Wild Animal Park WRP	14			14
San Diego, City of	Aqua II	18			18
Vallecitos WD	Meadowlark WRP	9			9
(San Marcos CWD)					
Santa Fe IWD	Fairbanks Ranch WPCF			140	140
Santa Fe WD	Rancho Santa Fe WPCF			264	264
Valley Center MWD	Lower Moosa Canyon			205	205
TOTAL:		1,209	1,164	5,573	7,946

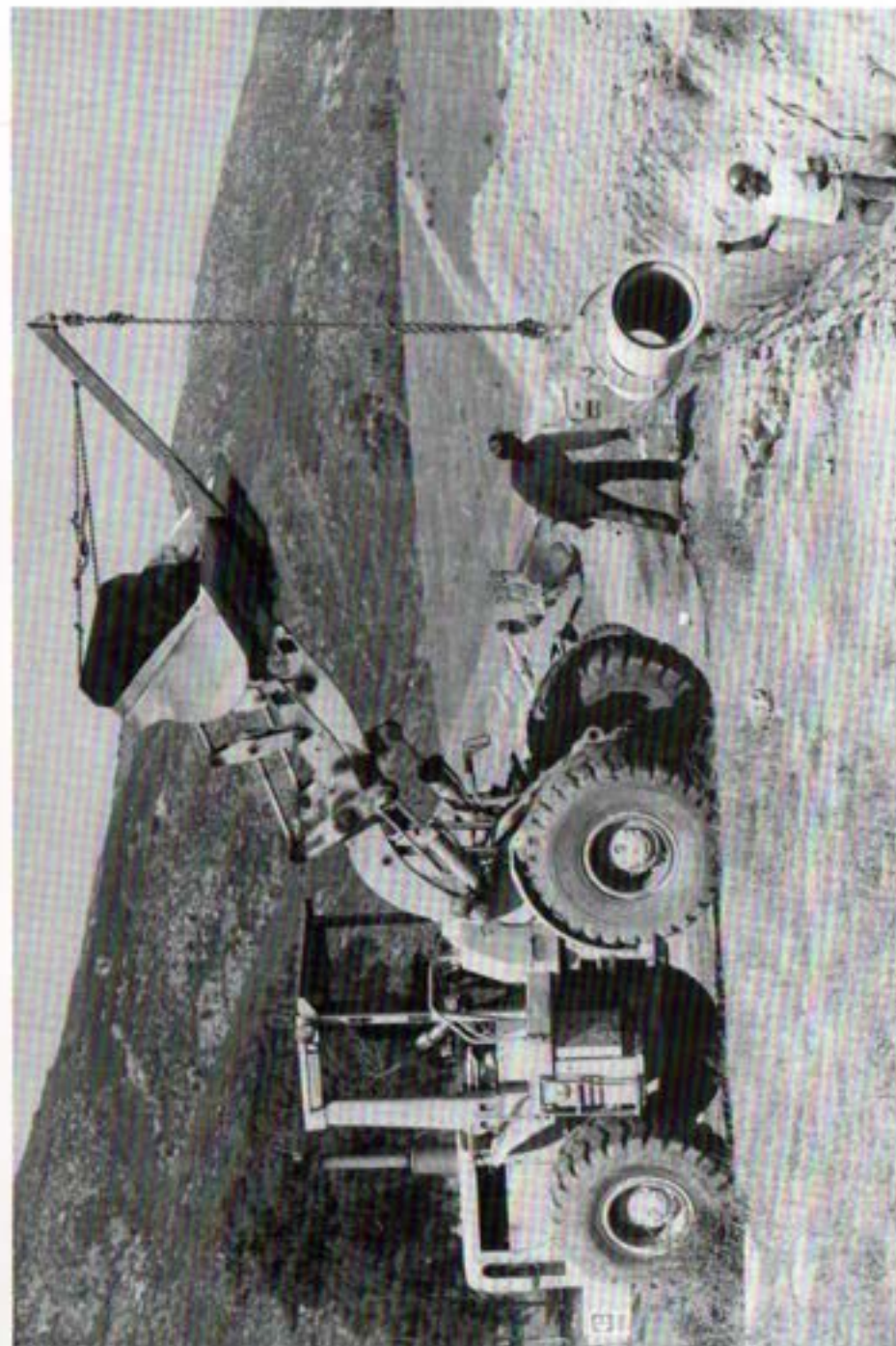


Figure No. 10

During fiscal year 1988-89, construction began on the reclaimed water distribution system to serve the Eastlake Development in Chula Vista. In 1990 the Otay Water District expects to begin supplying the project with approximately 1,200 acre-feet/year of reclaimed water to irrigate commercial, residential areas, schools and a golf course.

WATER RESOURCES PLANNING DEPARTMENT

At the beginning of the 1989 fiscal year the Water Resources Planning Department was formed to address the long range resource planning and policy analysis needs of the Authority. This five member department reports to the Assistant General Manager of Resources Division and prepares items which generally appear before the Board's Long Range Planning and Water Policy Committees. In order to carry out the planning and policy directives of the Board, the work program for the department is divided into the following program areas.

Water Resources Plan

A major task begun this year is to produce the Authority's first Water Resources Management Plan. This plan will look at the long term water resource needs of the Authority, analyze the alternatives available for meeting resource needs and recommend a series of policy and planning objectives for Board consideration and adoption. This planning process will incorporate findings of the Optimal Storage Study under preparation by James M. Montgomery Consulting Engineers.

Water Storage Evaluation

In March 1989, the Authority contracted with James M. Montgomery Consulting Engineers to prepare the Optimal Storage Study. This study, authorized after the Pamo Dam and Reservoir project was withdrawn from consideration, will take a comprehensive look at the Authority's water storage needs and transmission capabilities and analyze various solutions to meet these needs. This comprehensive study will cover the Authority's entire system and incorporate all of the major existing and proposed storage facilities of the Authority's member agencies. The study will also evaluate opportunities for groundwater development and conjunctive use. Findings from this study will be incorporated into the Water Resources Plan which may recommend specific projects for future action.

Water Supply Development

This program exists to evaluate in detail specific water resource options including imported water, water transfers or marketing, water salvage

projects and alternative technology such as desalinization. The primary focus during the past year for this program has been on the Bay-Delta proceedings of the State Water Resources Control Board. With the creation of the Planning Department, the Authority has been able to play a more active role in this Board's process of allocation of future state water supplies from the Sacramento-San Joaquin Delta. Department staff have been taking active roles in workgroups sponsored by the State Board, the Department of Water Resources and others to sort through the technical and policy issues critical for resolving the complex resource decisions involved in the Bay-Delta process.

Water Conservation Projects

The Department is working towards an expanded conservation effort focusing on specific projects which will generate verifiable water savings. Key among these activities are the agricultural irrigation and turf audit programs performed by the Mission Resource Conservation District and partially underwritten by the Authority. The Authority has also joined forces with the City of San Diego and the State Department of Water Resources to establish a California Irrigation Management Information System (CIMIS) station on the Balboa Park Golf Course. The conservation staff is also developing new conservation programs which will take advantage of the funding provided through the Metropolitan Water District's conservation incentive program. Under this program conservation staff helped coordinate an application by the City of San Diego for program funds to retrofit 50,000 pre-1980 houses in the city with water conserving fixtures. The Authority is also helping coordinate retrofit programs for a large amount of Navy housing in the area. Long-term conservation plans are being developed as part of the Water Resources Plan.

In addition to programs focusing on increasing the efficiency of water use, conservation staff has played a lead role on the Water Authority's Joint Public Information Council in developing a model emergency water management ordinance. This model, approved and supported by the Board of Directors, is designed and intended to be adopted by the local water agencies for use in a serious water shortage.

General Planning Services

This program encompasses the planning activities the Authority performs in conjunction with other agencies such as the San Diego Association of Governments, San Diego County and the cities throughout the region whenever regional water supplies are at issue. Under this program the Authority has been monitoring the siting process for new County sanitary

landfills to assure protection of current and potential water supplies.

Database Management

The department is also charged with the task of quantifying the amount of water production primarily for the purpose of producing data necessary for the Finance department's billing process. This data is also vital for analysis of water consumption trends as part of the planning process. With the advent of new water sales and storage programs, this process is becoming increasingly complex and ever more important.

PUBLIC INFORMATION

Imported water has been the major supply for the San Diego region since 1947 and will continue to serve the needs of this growing region for the foreseeable future.

Greater emphasis was placed on public information and education during the 1988-89 fiscal year to develop a stronger awareness of the critical nature of imported water, and to suggest activities the public can and should support to secure a safe supply.

Major activities during the fiscal year centered around personnel reorganization, expansion of existing programs, and development of new programs.

Water Conservation Information

Conservation programs were expanded and new ones were developed to respond to a prolonged drought and to create a permanent water conservation ethic among San Diegans.

Several water conservation campaigns were conducted during the fiscal year to educate the general public on drought conditions and the need to conserve water.

The fiscal year started with the campaign: "Water Conservation, San Diego's Way of Life;" followed by "Don't Let San Diego Drop Dry;" and concluded with "Don't Be a Waterhog."

The campaigns were coordinated with the Water Authority's 25 member agencies, Metropolitan Water District, the California Office of Water Conservation, the Water Education Foundation, and the Association of California Water Agencies.

Billboards, radio and newspaper advertising, restaurant water served upon request tent cards, water conservation decals and kits, public service announcements, press conferences, and press releases were used extensively to promote water conservation campaigns and to reinforce the Authority's water conservation and demand management programs. Additionally, the Water Authority co-sponsored free car wash demonstrations with the Poway Der Weinerschnitzel fast food outlet. Poway high school students demonstrated efficient car wash techniques which minimize water use.

Publications

Three major publications were introduced during the year. *Watertalk* is published quarterly to keep the San Diego community informed about activities undertaken by the Water Authority to secure and protect the water interests of the region.



Local girl scouts help celebrate the Authority's kick-off event for Water Awareness Week 1989.

The second publication, *Connections*, is published monthly for Water Authority personnel to keep them apprised of the impact their contributions have on the Water Authority's quest for water for San Diego.

Thirdly was a general brochure about current activity and future Authority plans, titled *H₂O: Our Formula for San Diego's Future*.

Water Awareness Week

The Water Authority participated in the 1989 annual California Water Awareness Week campaign with the theme "Water is Life: Water Conservation San Diego Style." The campaign was conducted statewide by water purveyors to inform the communities they serve about their water supply.

Locally, the campaign was launched with a special event at the San Diego Community Concourse. Water industry representatives, the press, elected officials, the Girl Scouts, and an audience of over 250 attended. The Authority Chairman and San Diego Deputy Mayor spoke of the importance of being water aware, 60 girl scouts pledged to use water wisely, and clowns, balloons and music helped create a festive atmosphere.

Education

The Water Authority recognizes the importance education plays to insure an adequate supply of water for future generations as today's students become the leaders and decision makers of the future.

Classroom presentations are offered free of charge to all K-12 students in San Diego County with the objective of instilling the impact water has on San Diego's present and future economy and the effect on its quality of life for everyone.

The program has been praised by school administrators, classroom teachers, and students. Approximately 25,000 students participate in the program annually. However, the Water Authority staff is constantly searching for activities and programs to improve the quality of the school program to reach an even greater number of students with its water message.

During the fiscal year, the Water Authority co-sponsored two AIMS (Activities that Integrate Mathematics and Science) Workshops with Helix Water District. AIMS is a nation-wide program that prepares classroom teachers to instruct other teachers how to conduct water education and conservation courses in the classroom.

Another innovative program that has proven effective in assembly settings is a live-stage production. The Water Authority authorized staff to contract with the Small Change Theatre Production Company to present its "Alice in Waterland" play to K-6 students in 10 schools in San Diego County on an experimental basis. The program is under consideration

6 Ways to Spot the Common Waterhog.



Waterhogs can't wait. They have to run the dishwasher before it's fully loaded.

Waterhogs make their lawns so tight they can almost drive on and drive up.

Waterhogs like to light their lawn. They brush to conserve with running water.

Waterhogs use 100 gallons flooding their driveway's instead of directing them with a broom.

Waterhogs drink lots of water on cool days of months.

Waterhogs have lots of water. They use 75 gallons to wash their cars and waste another 75 on their driveways.

Unlike the Loch Ness Monster and Big Foot, waterhogs are everywhere. You'll find them at home, at work, in yards. And more often than not, in mirrors. Waterhogs wreak havoc with California's precious water supply by being

wasteful, careless and unconcerned. Next time you spot a waterhog, do what you can to make him an endangered species.

Don't be a Waterhog.

SAN DIEGO COUNTY WATER AUTHORITY

The award winning Waterhog character introduced in 1989, has become the symbol for the Water Authority's water conservation efforts.

as a permanent addition to the elementary school program.

Xeriscape

Landscaping can demand 50 percent of the water used for home consumption. Xeriscape is a water-saving concept which utilizes water-wise gardening techniques that can produce irrigation savings from 30 percent to 80 percent.

Recognizing Xeriscape gardening as a means to conserve water on a large-scale basis, the Water Authority co-sponsors the annual Xeriscape conference in San Diego County. The conference offers workshops, seminars, and demonstrations on design, installation, maintenance and irrigation. The conferences are directed at the green industry—landscape architects and landscape contractors, nurserymen, irrigation consultants and manufacturers, garden and golf course maintenance personnel. The general public also is encouraged to attend.

The Water Authority's commitment to Xeriscaping goes beyond just staging the conference. A Xeriscape incentive program is available to member agencies to encourage them to establish Xeriscape demonstration gardens in their respective service areas.

Media Activity

Water conservation campaigns, potential earthquakes, the Water Quality Bay-Delta hearings, the San Diego Gas and Electric/Southern California Edison Merger Study, the Master Water Distribution Improvement Plan, major pipeline construction projects, and the Capital Financing Plan drew considerable media attention during the fiscal year.

Water Authority board members and staff conducted numerous live and taped radio and television interviews. Aside from paid advertising for water conservation programs and notices of public meetings, the print media devoted numerous articles and editorials to Water Authority activities during 1988-89.

Public Information Council

The Water Authority and its member agencies created a Joint Public Information Council during fiscal year 1989 as a major step to improve communications and to maximize and coordinate public affairs activities.

Logo

A new logo, shown as follows, was adopted by the Board of Directors to reflect the modern, changing nature of the Authority.



San Diego County Water Authority

HUMAN RESOURCES

Fiscal year 1989 saw the continued progress of the recently-created Human Resources Department in its goal of becoming an efficient and fully-operational department.

One significant step was to hire a Personnel Director to develop the department. The director has established a priority list of policies and procedures to be pursued. Among the policies and procedures that have been developed and implemented are those related to hiring, status changes, compensation practices, performance evaluations, and other related activities. In progress is the development of a Personnel Policies and Procedures manual which will provide a written and accessible document of those significant policies and procedures that impact employees and operations and allow for equitable and consistent application.

Employment

On July 1, 1988, the Water Authority had 59 employees. By June 30, 1989, the number had increased to 82. During this period, the Human Resources Department recruitment program facilitated the hiring of 27 new employees. During this same time span, one employee retired, two employees terminated their services, and one probationary employee was terminated.

The following indicates the positions filled in the year, by division:

Administrative Services Division

Director of Public Information	Director of Personnel
Finance Manager	Librarian
Accounting Specialist	

Water Resources Division

Director of Planning	2 Water Resource Specialists
Computer Specialist	Associate Civil Engineer

Engineering, Operations and Maintenance Division

Chief Engineer	3 Systems Operators
Senior Civil Engineer	4 Maintenance Workers
Associate Civil Engineer	Mechanic
2 Engineering Technicians	Clerical Assistant
3 Systems Technicians	



CWA Intramural Softball Game



CWA Annual Picnic

Employee Relations

A salary and classification study commissioned by the Water Authority was successfully completed and implemented. The study included participation from both management and labor, and included wage levels and job descriptions which form the framework of the Water Authority's classification and compensation plan.

Labor negotiations with the various employee groups through the meet-and-confer process were also successfully completed. The Water Authority negotiated a two-year agreement on a salary and benefits package which will end June 30, 1991.

Special Activities

The Employee Association, which conducts all Authority personnel social activities was very active during the year. The Association produced the traditional Christmas party, the summer annual picnic, organized a softball game between Escondido and San Diego personnel, put on a Family Fun Day, and conducted the Employee Incentive Awards Program.

The most significant event of the year's social activities was the Employees Incentive Awards banquet hosted by the Authority.

The 1988-89 Employees of the Quarter, the Employee of the year, and perfect attendance or near perfect attendance employees were honored at the banquet. Authority employees, their spouses and guests were in attendance. Other special guests were Authority Chairman of the Board Dale Mason and Mrs. Mason and the Honorable Assemblyman Robert Frazee and Mrs. Frazee.

Employees of the Quarter are selected on the basis of outstanding achievement and dedication. Attendance awards are presented to employees who did not use any sick leave or used less than eight hours of sick leave within a 12 month period.

The Employees of the Quarter were introduced by their respective nominator. A brief background on each honoree preceded the presentation of gift certificates. The perfect or near perfect employee awards followed.

The highlight of the Incentive Awards banquet was the announcement of the Employee of the Year by Authority General Manager Lester Snow.



JOE WEGAND
*Employee of the 1st Quarter
September 88*



SUSAN BOHLANDER
*Employee of the 2nd Quarter
December 88*



CHRIS DUNCAN
*Employee of the 3rd Quarter
March 89*



MARTIN BRIDGES
*Employee of the 4th Quarter
June 89
and
Employee of the Year
Fiscal year 1988-89*

TREASURER'S REPORT

For the fiscal year ending June 30, 1989, total Water Authority income was \$137,589,630. Total disbursements during the year were \$124,672,855. At the fiscal year end, the Treasurer was accountable for funds and investments totaling \$163,454,193.

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 of Directors 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 Water Authority Administrative Code requires the Treasurer to report a summary of financial transactions monthly and for each fiscal year-end. For fiscal year 1988-89, the summary is as follows:

SUMMARY (Dollars in Thousands)

	1989	1988
Water Sales	\$127,020	\$109,838
Cost of Sales	113,804	102,399
Operating Expenses	5,862	3,278
Depreciation	<u>1,949</u>	<u>1,930</u>
Operating Income	5,404	2,230
Nonoperating Income/Expense	<u>7,513</u>	<u>5,802</u>
Net Income	<u><u>12,917</u></u>	<u><u>8,032</u></u>

As of June 30, 1988 and 1989, the Treasurer's cash accountability was as follows:

	June 30	
	1989	1988
Cash and cash equivalents:		
Certificates of deposits	\$ 28,311,031	\$22,768,000
U.S. government securities	7,775,278	75,227
Insured demand deposits	59,840	31,676
	<u>\$ 36,146,149</u>	<u>\$22,874,903</u>
Restricted cash and guaranteed investment contract deposits:		
Guaranteed investment contract deposits	\$125,976,897	\$ -
U.S. government securities	1,331,147	1,331,147
	<u>\$ 127,308,044</u>	<u>\$ 1,331,147</u>

LEGAL DEPARTMENT

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

Routine Matters

Legislation was enacted which permits members of the Board of Directors of a County Water Authority to receive compensation not to exceed \$100 per diem for six days in any month. Implementation of this legislative authority became effective for Authority members in April of 1989.

Other routine matters included advice about Brown Act changes, disclosure statement requirements, changes in the Authority Administrative Code, minor ongoing litigation, and staff-related activities such as a Memorandum of Understanding with the employees.

Contractual Matters

Increased contractual documentation continues as the capital improvement program unfolds. Engineering design contracts were made to design the rehabilitation of the Shepard Canyon pipeline, a bypass connection near Sweetwater dam, pipeline 5 extension, pipelines 4 and 4-A extensions, and to study overall regional storage needs.

Major contracts for construction of the Ramona Pipeline, and rehabilitation of the Shepard Canyon pipeline were made. Review of these matters also included analyses of compliance with the requirements of the California Environmental Quality Act.

Special legal services were arranged with Art Littleworth of Best, Best & Krieger, Riverside to render advice concerning agreements necessary to implement the intentions of Congress in Public Law 100-675 which provided for settlement of disputes among users of San Luis Rey River water (five Mission Indian Bands and Escondido and Vista) and for development of conserved water along the All-American canal. Also, Michael Gatzke of Gatzke, Mispagel and Dillon, Carlsbad, was engaged to render litigation services in connection with the San Diego Gas & Electric Company litigation.

Reclamation Actions

The Authority ended further research and study for the Coordinated Chemical Bonding and Adsorption (CCBA) process, a research project acquired from the San Diego Region Water Reclamation Agency. Contracts under the technical assistance program were made to study reclamation in the San Luis Rey, Santa Margarita, and San Pasqual watersheds.

A model ordinance, designed to assist in developing common efforts region-wide to encourage reclamation efforts and discourage the discharge of harmful pollutants into sewage treatment facilities, was prepared.

MWD Matters

Informal discussions continued regarding San Diego's frustration about the inconsistency between MWD's section 135 (preferential rights) and the Laguna Declaration (meet all supplemental needs of each member agency). However, no definitive program for resolution has been developed.

Under legislation, it is noted that the outdated provisions in the County Water Authority Act regarding allocation of water among member agencies were replaced.

The Authority continued to monitor negotiations between MWD and the Imperial Irrigation District and was pleased when an agreement was reached in December 1988 which provided for MWD to spend around \$100 million so that IID could create about 100,000 acre feet of conserved water for use by MWD.

The Authority continues to cooperate with MWD in connection with the Bay-Delta proceedings. It also is independently participating in workshops and other scoping sessions of the State Water Resources Control Board and others.

Standby Charges

Actions were taken to implement section 5.2 of the County Water Authority Act which authorizes establishment of a \$10 per parcel or per acre standby charge. A public hearing was held and a resolution adopted a schedule of charges for all land within the boundaries of the Authority. Complete implementation will require adoption of an ordinance in August for the 1989-1990 fiscal year.

These charges were an integral part of the financing program for the Water Distribution Plan, a capital improvement program. Certificates of Participation, Series 1989A, were issued in the amount of \$140 million to fund the early phases of the capital improvement program.

SDG&E

In November 1988, The San Diego Gas and Electric Company announced an agreement to merge into Southern California Edison. This came as a surprise to the community because of media information during previous months that SDG&E was seeking a merger with Tucson Electric Company and opposing a hostile takeover attempt by SCE. Many civic and business leaders were concerned about adverse social and economic impacts to the ratepayers and the community which might result. An understanding, memorialized in an MOU, was reached between the City of San Diego and the Authority to take actions which would assist in evaluating all aspects of the proposed merger. The merger proposal was approved by the shareholders of each Company, but also required approval by both the California Public Utilities Commission (CPUC) and the Federal Energy Regulatory Commission (FERC).

The City agreed to participate in the regulatory proceedings before both CPUC and FERC and the Authority agreed to take steps to evaluate the potential of public ownership. In fulfilling its part, the Authority sponsored legislation in the form of S.B. 229 which was introduced by Senator Larry Stirling. It provided mechanisms whereby the Board of Supervisors could have called an election within San Diego County to consider forming a new public agency empowered to fund the acquisition of SDG&E's gas and electric systems if a majority of the voters approved. However, strong and effective opposition from SDG&E and other private, investor-owned utilities defeated the bill in committee.

In addition, the Authority engaged consultants to study the feasibility of public ownership and to assess its economic consequences. It is expected that these studies will be completed by the end of calendar year 1989.

After the board adopted Resolution 89-4, which authorized the expenditure of Authority funds to carry out its commitments to the City on February 9, 1989, SDG&E filed a suit in superior court seeking to enjoin such expenditures as legally improper. Although a temporary restraining order was issued, the court denied a preliminary injunction on the grounds that the Company would not likely prevail on the merits. A trial on the merits would not likely occur before calendar 1990.

Legislation

As previously noted, legislation was sponsored by the Authority.

A.B. 622 (Frazee) amended section 5 and added section 5.3 to the County Water Authority Act. There were some editing changes made to section 5, but a major substantive change to subsection 5(aa) eliminated the prior language which provided for "a preferential right to purchase" water from the Authority based upon historic payments made to the Authority by each member agency.

Two critical aspects of successful water management are the fair and equitable allocation of cost and the proper allocation of water when there is a shortage.

Since the allocation of costs is an annual function whereby total costs of service are divided by the Board of Directors among water users, potential water users, and taxpayers, it must be presumed that each year all beneficiaries of the water supply pay a fair and equitable share of the costs for that year. Ad valorem tax rates apply the same to all taxpayers and water charges apply the same to each class of water user.

However, the essential importance of water, to even life itself, dictates that allocation of it be measured, in the main, by needs of the user and not upon historic payments for sharing past costs of service. When the Authority is unable to meet the needs of users because of an inadequate delivery system, careful decisions about capital improvements must be made. When the Authority is unable to meet the needs of users because of an inadequate water supply, careful decisions about securing additional supplies must be made. In both events, the circumstances will present complex factors none of which will be solved by looking to historic payments for the Authority's cost of service. Instead, difficult, rational, equitable, and comprehensive decisions will be required to fairly and humanely allocate available supplies among the users. Therefore, the following provision was added to section 5(11) and now governs the Authority:

The board of directors, as far as practicable shall provide each of its member agencies with adequate supplies of water to meet their expanding and increasing needs. If available supplies become inadequate to fully meet the needs of its member agencies, the board shall adopt reasonable rules, regulations, and restrictions so that the available supplies are allocated among its member agencies for the greatest public interest and benefit.

Section 5.3 made provision for member agencies to elect to pay all or a portion of the amount of standby charges established for land within the member agency.

S.B. 229 (Stirling), as noted, was sponsored by the Authority, but was defeated in the Senate Committee.

METROPOLITAN WATER DISTRICT MEMBERSHIP

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

The Metropolitan Water District 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 the 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, subject to the 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. These district member agencies are listed in Figure 11.

The Water Authority has six representatives on the MWD Board of Directors, all of whom are members of the Water Authority Board.

Harry Griffen, who has served on the MWD Board for 26 years, is a member of the Executive Committee, the Finance and Insurance Committee, the Water Problems Committee and the Special Budget Committee.

John F. Hennigar, who was appointed on October 9, 1986, and serves on the Engineering and Operations Committee, the Organization and Personnel Committee and the Special Committee on Water Quality.

Francesca M. Krauel, who has been a MWD Director for five years, is a member of the Finance and Insurance Committee, the Legal and Claims Committee and the Special Committee on Water Quality.

Michael D. Madigan has been on the MWD Board for seven years. He is an ex officio member of the Executive Committee, Chairman of the Land Committee, and a member of the Engineering and Operations Committee, the Special Committee for Communications Study, the Special Committee on Department Head Compensation Committee, the Ad Hoc Committee on Energy and Desalination and the Bay Delta Political Advisory Ad Hoc Committee.

Dale Mason, who was appointed on December 19, 1986, is a member

SAN DIEGO COUNTY WATER AUTHORITY

increased \$32,207,552,751, or 5.7 percent, above the previous year's valuation of \$564,692,806,207. An amount of \$1,999,247,001, or 6.2 percent of this increase, occurred within the Authority's boundaries. Assessed valuation within the Authority is 15.4 percent of the MWD total.

The assessed valuation of MWD established for 1989-1990 is \$671,699,558,661 which includes \$103,686,252,840 for the Authority's valuation.

Water Sales

MWD delivered 2,108,195 acre-feet of water during fiscal year 1988-89. Delivery to the Authority of 592,216 acre feet represented 28.1 percent of MWD's total deliveries.

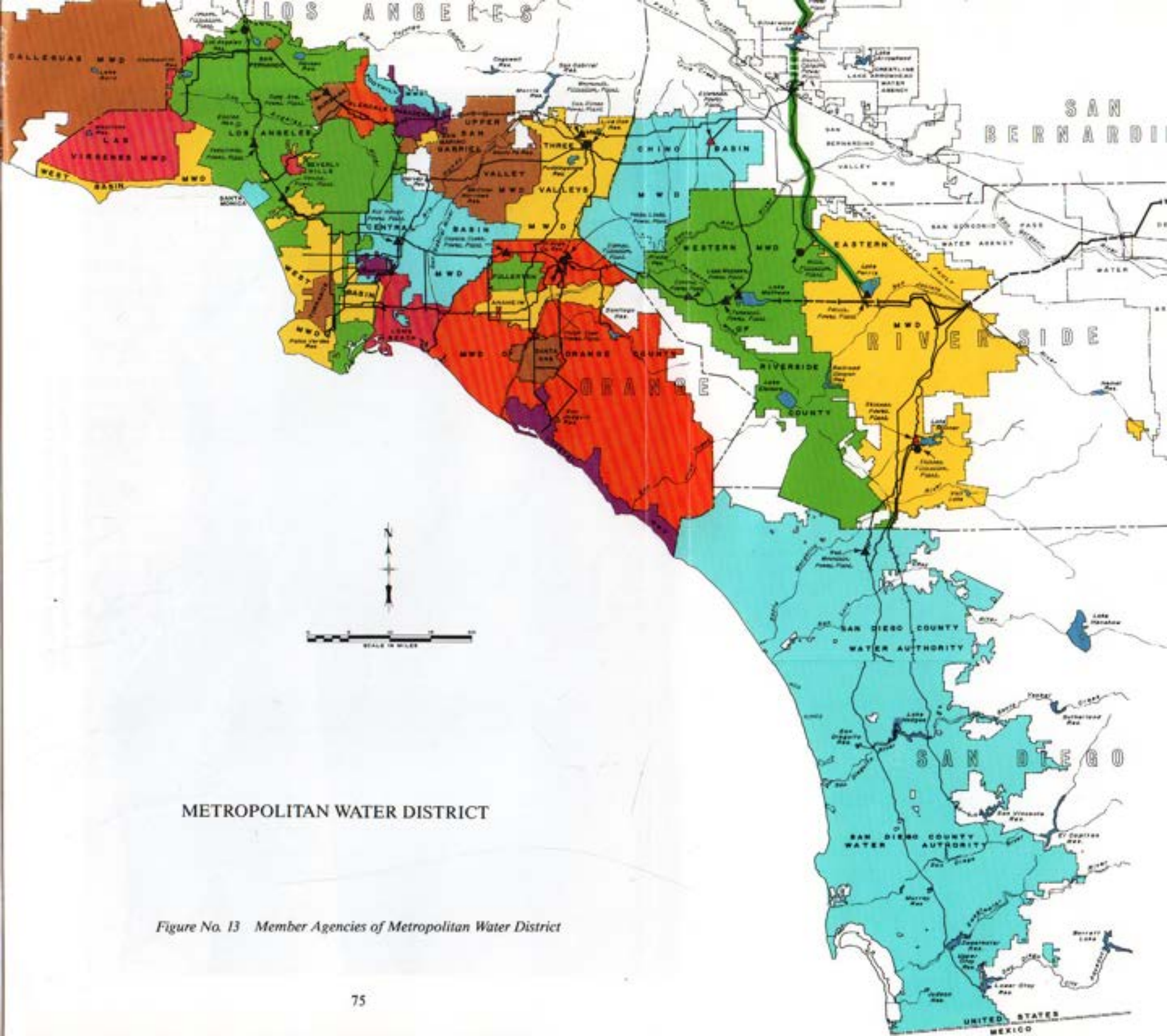
MWD has five filtration plants in operation. The Skinner Filtration Plant, with a capacity of 340 mgd, serves a portion of the treated water requirement of the Authority.

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 .011 percent of assessed valuation for the 1988-89 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 1988-89 fiscal year, including regular and special taxes, was approximately \$74,604,738 of which \$10,520,530, or 14.1 percent, was levied against property within the Authority. The estimated tax level for the 1988-89 fiscal year is \$90,439,141 for MWD as a whole and includes \$12,886,364 for the Authority's service area.





METROPOLITAN WATER DISTRICT

Figure No. 13 Member Agencies of Metropolitan Water District

COLORADO RIVER BOARD MEMBERSHIP

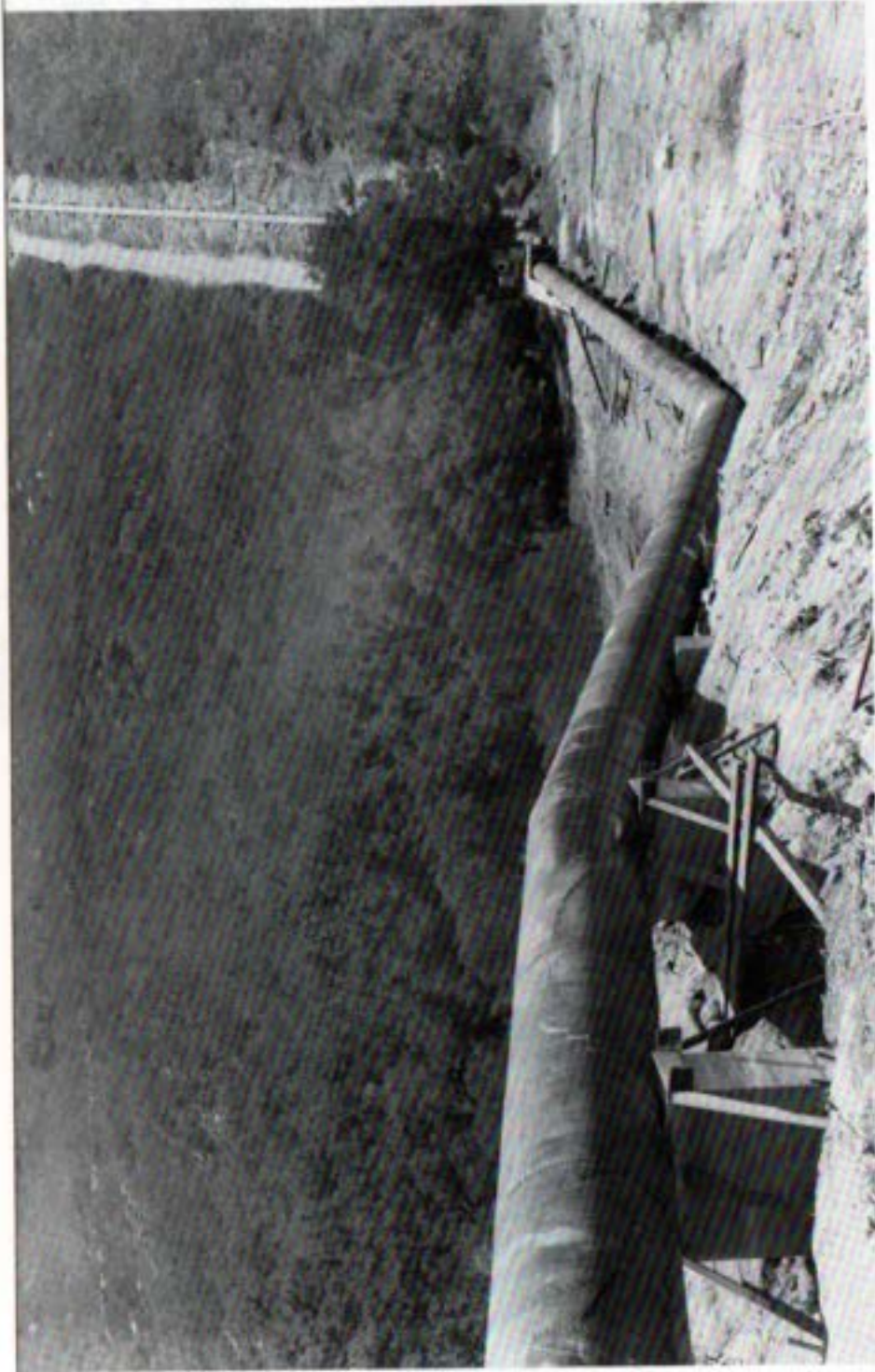
The Colorado River Board of California is an agency of the State dedicated to the protection of California rights and interests in Colorado River system water and power resources.

The Board members were originally selected by the Governor from a list of persons submitted by each of the six agencies having rights to Colorado River resources. The six agencies are: San Diego County Water Authority, Metropolitan Water District of Southern California, City of Los Angeles Department of Water and Power, Coachella Valley Water District, Palo Verde Irrigation District, and Imperial Irrigation District.

The Board was reorganized in April 1977 and enlarged from six to eleven members pursuant to legislation enacted in 1976. The five new members consist of two State officers, the Director of the Department of Fish and Game, and the Director of the Department of Water Resources as ex officio members; and three 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. Under the revised statutes, the Governor is to appoint both a member and an alternate 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. John P. Starkey represents the Water Authority on the Board, and John M. Cranston serves as his alternate.

Once fully funded 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.



*Water Pipeline near Henshaw Dam - Circa 1924
San Diego Historical Society - Ticor Collection*

SAN DIEGO COUNTY WATER AUTHORITY

Table 1
STATISTICAL SUMMARY

	1987-88	1988-89	Percent Change
GROWTH OF AREA			
Number of Agencies	24	24	-0-
Total Area—Acres	907,634	908,069	-0-
Population	2,253,216	2,346,208	+4.1
Assessed Valuation	89,993,730,693	91,992,997,704	+2.2
OPERATIONS			
Water Imported by Authority-af	552,841	597,117	+8.0
Water Production of Agencies-af	580,153	626,502	+8.0
*Local Water Used-af	55,798	51,722	-7.3
Authority Water Used-af	524,355	574,780	+9.6
Miles of Pipeline	222	222	-0-
Miles of Patrol Roads Maintained	105	105	-0-
Number of Service Connections	77	78	+1.3
FINANCIAL			
Water and Other Sales	\$ 109,837,499	\$ 127,019,817	+15.6
Operating Expenses:			
Cost of Sales	102,398,696	113,803,502	+11.1
Plant Maintenance	873,481	1,275,982	+46.1
Depreciation	1,930,891	1,949,410	+1.0
General and Administrative	2,404,658	4,586,770	+90.7
Total Operating Expenses	107,607,726	121,615,664	+13.0
Operating Income	2,229,773	5,404,153	+142.4
Nonoperating Revenues (Expenses):			
Property Taxes and In-lieu Fees	6,340,573	7,116,183	+12.2
Interest Expense	(2,719,759)	(3,057,191)	+12.4
Interest Income	2,181,074	2,844,402	+30.4
Other Income	-0-	609,228	-0-
Total Nonoperating Revenues	5,801,888	7,512,622	+29.5
Net Income	8,031,661	12,916,775	+60.8
Retained Earnings at Beginning of Year	102,250,884	110,282,545	+7.9
Retained Earnings at End of Year	\$110,282,545	\$123,199,320	+11.7

*Does not include Pendleton Military Reservation

TABLES

Table 2
POPULATION GROWTH—COUNTY AND AUTHORITY AREA
1910 to 1989
(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	74,490	(5) 2,105,500	75,000	97
1987.....(7)	2,240,659	87,025	(5) 2,181,000	72,216	97
1988.....(7)	2,327,684	90,492	(5) 2,253,216	92,992	97
1989.....(7)	2,418,176		(5) 2,346,208		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 Department of Planning and Land Use, San Diego County.
- * Corrected estimate by Integrated Planning Office, San Diego County.

SAN DIEGO COUNTY WATER AUTHORITY

Table 3
AREA—AUTHORITY MEMBER AGENCIES

	Areas Within Authority			Percent of Total Authority Area 6/30/89
	As of 6/30/88 (acres)	Changes During Year (acres)	As of 6/30/89 (acres)	
Bueno Colorado M.W.D. (2)	19,824	-22	19,802	2.18
Carlsbad M.W.D. (3)	20,369	0	20,369	2.24
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)	21,320	124	21,444	2.36
Fallbrook P.U.D.	16,197	2	16,199	1.78
Helix Water District (4)	31,278	0	31,278	3.44
National City, City of	5,573	0	5,573	0.61
Oceanside, City of	25,698	0	25,698	2.83
Olivenhain M.W.D. (5)	30,821	-6	30,815	3.39
Otay M.W.D. (6)	63,022	41	63,063	6.94
Padre Dam M.W.D. (8)	54,503	-41	54,462	6.00
Pendleton Military Res.	134,625	0	134,625	14.83
Poway, City of	23,214	0	23,214	2.56
Rainbow M.W.D. (10)	47,239	-2	47,237	5.20
Ramona M.W.D.	46,524	0	46,524	5.12
Rincon del Diablo M.W.D. (7)	10,572	-125	10,447	1.15
San Diego, City of	210,282	435	210,717	23.20
San Dieguito W.D.	5,640	0	5,640	0.62
Santa Fe Irrigation District	10,173	6	10,179	1.12
South Bay I.D. (9)	15,569	0	15,569	1.71
Vallecitos Water District (15)	28,444	23	28,467	3.13
Valley Center M.W.D. (11)	60,986	0	60,986	6.72
Yuima M.W.D.	12,813	0	12,813	1.41
Total Authority Area	907,634	435	908,069	100.00
San Diego County	2,725,100	0	2,725,100	

- (1) Includes Vallecitos W.D. (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 16,255 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 1989	
1970 (13)	1980 (13)	Decade Increase 1970-80 Percent	1989 Estimate (14)	Annual Increase 1988-89 Percent	Per Acre	Per Sq. Mile
39,000 (1)	51,000	31	73,491	8.72	3.71	2,375
15,500	31,500	103	53,210	8.59	2.61	1,672
3,900	5,040	29	5,131	0.21	4.43	2,833
150	225	50	384	41.70	0.03	21
36,000	64,100	78	100,370	5.75	4.68	2,996
12,000	18,700	56	23,027	3.09	1.42	910
163,000	203,500	25	225,832	1.12	7.22	4,621
39,000	47,200	21	50,859	0.12	9.13	5,841
40,700	77,800	91	115,000	6.60	4.48	2,864
2,000	23,000	1,050	42,300	4.96	1.37	879
19,400	51,600	166	83,000	3.42	1.32	842
46,000	89,000	93	105,921	6.67	1.94	1,245
-	33,150	-	50,000	4.17	0.37	238
14,000	33,620	140	43,122	7.00	1.86	1,189
4,200	7,800	86	11,633	6.28	0.25	158
6,800	16,000	135	30,500	3.39	0.66	420
18,900	13,800	-27	25,000	3.96	2.39	1,532
675,800	849,600	26	1,086,600	2.64	5.16	3,300
21,800	30,900	42	34,370	4.25	6.09	3,900
8,600	14,700	71	19,000	11.50	1.87	1,195
80,000	99,200	24	105,854	0.62	6.80	4,351
-	24,200	-	45,584	4.90	1.60	1,025
7,000	10,200	46	14,200	7.33	0.23	149
1,250	1,820	46	1,820	0.00	0.14	91
1,255,000	1,797,655	43	2,346,208	3.52	2.58	1,654
1,310,800	1,808,200	38	2,418,176	3.89	0.89	568

- (10) Does not include 701 acres overlapping in City of Oceanside.
- (11) Does not include 1,177 acres overlapping in City of Escondido.
- (12) Includes 1,177 acres overlapping in Valley Center M.W.D., 405 acres overlapping in Vallecitos W.D., 37 acres overlapping in Bueno Colorado M.W.D., and 16,255 acres overlapping in 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 405 acres overlapping in City of Escondido.

* Corrected figures per agencies.

SAN DIEGO COUNTY WATER AUTHORITY

Table 4
 WATER PRODUCTION, AGRICULTURAL USE, AND AUTHORITY STORAGE
 FISCAL YEAR 1988-89
 (Compilation of data furnished by member agencies)

Member Agencies	SOURCE OF WATER (3)				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 Ac.Ft./Ac./Yr.	Estimated Population	Water Production Per Capita Ac. Ft./Cap./Yr.	WATER USED FOR AGRICULTURE		
	Local Supply		Authority Supply									From Local Supply		From Authority
	Amount Ac. Ft.	Percent	Amount Ac. Ft.	Percent								Amount Ac. Ft.	Percent	Amount Ac. Ft.
Bueno Colorado M.W.D.	8,440.6	41.3	12,016.1	58.7	20,456.7	19,802	16,478	83.2	1.24	73,491	0.28	986.3	36.8	1,691.9
Carlsbad M.W.D.	0.0	0.0	16,475.5	100.0	16,475.5	20,369	19,400	95.2	0.85	53,210	0.31	0.0	0.0	2,317.1
Del Mar, City of	0.0	0.0	1,473.8	100.0	1,473.8	1,159	1,082	93.4	1.36	5,131	0.29	0.0	0.0	0.0
De Luz Heights M.W.D.	97.8	3.2	2,943.7	96.8	3,041.5	11,789	2,740	23.2	1.11	384	7.92	93.9	3.2	2,854.2
Escondido, City of	6,523.5	24.2	20,426.7	75.8	26,950.2	21,444	18,623	86.8	1.45	100,370	0.27	1,684.6	29.2	4,077.3
Fallbrook P.U.D.	0.0	0.0	12,903.5	100.0	12,903.5	16,199	11,154	68.9	1.16	23,027	0.56	0.0	0.0	6,859.0
Helix W.D.	4,177.7	9.5	39,978.6	90.5	44,156.3	31,278	30,231	96.7	1.46	225,832	0.20	61.1	10.7	509.9
National City, City of	3,024.1	42.7	4,057.2	57.3	7,081.3	5,573	5,078	91.1	1.39	50,859	0.14	0.0	0.0	0.0
Oceanside, City of	0.0	0.0	27,693.0	100.0	27,693.0	25,698	16,837	65.5	1.64	115,000	0.24	0.0	0.0	3,772.2
Olivenhain M.W.D.	0.0	0.0	12,594.9	100.0	12,594.9	30,815	15,250	49.5	0.83	42,300	0.30	0.0	0.0	1,680.1
Otay W.D.	0.0	0.0	20,469.7	100.0	20,469.7	63,063	33,905	53.8	0.60	83,000	0.25	0.0	0.0	1,038.1
Padre Dam M.W.D.	0.0	0.0	20,167.4	100.0	20,167.4	54,462	36,031	66.2	0.56	105,921	0.19	0.0	0.0	1,898.7
Pendleton Military Res.	—	—	107.7	—	107.7	134,625	N.A.	—	—	50,000	—	—	—	—
Poway, City of	310.5	2.4	12,728.9	97.6	13,039.4	23,214	10,016	43.1	1.30	43,122	0.30	0.0	0.0	917.4
Rainbow M.W.D.	0.0	0.0	32,054.9	100.0	32,054.9	47,237	17,551	37.2	1.83	11,633	2.76	0.0	0.0	27,069.3
Ramona M.W.D.	179.2	1.6	10,775.3	98.4	10,954.5	46,524	11,415	24.5	0.96	30,500	0.36	0.0	0.0	4,910.2
Rincon del Diablo M.W.D.	0.0	0.0	8,418.6	100.0	8,418.6	10,447	8,401	80.4	1.00	25,000	0.34	0.0	0.0	1,167.0
San Diego, City of (1)	16,274.5	6.7	228,438.7	93.3	244,713.2	210,717	112,540	53.4	2.17	1,086,600	0.23	0.0	0.0	848.6
San Dieguito W.D.	2,734.3	31.9	5,825.1	68.1	8,559.4	5,640	5,470	97.0	1.56	34,370	0.25	520.5	34.4	993.6
Santa Fe I.D.	4,021.9	32.6	8,302.5	67.4	12,324.4	10,179	10,179	100.0	1.21	19,000	0.65	456.3	35.2	840.8
South Bay I.D.	3,591.9	18.9	15,461.7	81.1	19,053.6	15,569	11,953	76.8	1.59	105,854	0.18	10.6	34.1	20.5
Vallecitos W.D.	0.0	0.0	12,741.7	100.0	12,741.7	28,467	12,616	44.3	1.01	45,584	0.28	0.0	0.0	3,440.6
Valley Center M.W.D.	0.0	0.0	47,243.4	100.0	47,243.4	60,986	38,905	63.8	1.21	14,200	3.33	0.0	0.0	40,756.4
Yuima M.W.D.	2,346.1	61.3	1,481.3	38.7	3,827.4	12,813	4,000	31.2	0.96	1,820	2.10	2,265.2	61.2	1,434.0
Total and Average	51,722.1	8.3	574,779.9	91.7	626,502.0	908,069	449,855	49.5	1.39	2,346,208	0.27	6,078.5	5.3	109,096.9

(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) Figures include losses from transmission and distribution system but not from reservoirs.
 N.A. - Not Applicable

Estimated Area Served by Water System Acres	Gross Area Served by Water System Percent	Water Production Per Acre Served Ac.Ft./Ac./Yr.	Estimated Population	Water Production Per Capita Ac. Ft./Cap./Yr.	WATER USED FOR AGRICULTURAL PURPOSES					Percent of Agricultural Water to Total Production	MEMBER AGENCIES' POOLED STORAGE IN SAN VICENTE RESERVOIR						
					From Local Supply		From Authority		Total Ac. Ft.		Total Quantity in Storage 6/30/88 Ac. Ft.	Placed into Storage During Fiscal Year Ac. Ft.	STORED WATER WITHDRAWN DURING FISCAL YEAR			Total Quantity in Storage 6/30/89 Ac. Ft.	
					Amount Ac. Ft.	Percent	Amount Ac. Ft.	Percent					By Delivery Ac. Ft.	By Evaporation Ac. Ft.	By Spill Ac. Ft.		
16,478	83.2	1.24	73,491	0.28	986.3	36.8	1,691.9	63.2	2,678.2	13.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19,400	95.2	0.85	53,210	0.31	0.0	0.0	2,317.1	100.0	2,317.1	14.1	1,606.0	102.1	0.0	102.1	0.0	1,606.0	1,606.0
1,082	93.4	1.36	5,131	0.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2,740	23.2	1.11	384	7.92	93.9	3.2	2,854.2	96.8	2,948.1	96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18,623	86.8	1.45	100,370	0.27	1,684.6	29.2	4,077.3	70.8	5,761.9	21.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11,154	68.9	1.16	23,027	0.56	0.0	0.0	6,859.0	100.0	6,859.0	53.2	1,606.0	102.1	0.0	102.1	0.0	1,606.0	1,606.0
30,231	96.7	1.46	225,832	0.20	61.1	10.7	509.9	89.3	571.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5,078	91.1	1.39	50,859	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16,837	65.5	1.64	115,000	0.24	0.0	0.0	3,772.2	100.0	3,772.2	13.6	3,211.9	204.2	0.0	204.2	0.0	3,211.9	3,211.9
15,250	49.5	0.83	42,300	0.30	0.0	0.0	1,680.1	100.0	1,680.1	13.3	535.3	34.0	0.0	34.0	0.0	535.3	535.3
33,905	53.8	0.60	83,000	0.25	0.0	0.0	1,038.1	100.0	1,038.1	5.1	1,606.0	102.1	0.0	102.1	0.0	1,606.0	1,606.0
36,031	66.2	0.56	105,921	0.19	0.0	0.0	1,898.7	100.0	1,898.7	9.4	2,141.3	136.1	0.0	136.1	0.0	2,141.3	2,141.3
N.A.	--	--	50,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10,016	43.1	1.30	43,122	0.30	0.0	0.0	917.4	100.0	917.4	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17,551	37.2	1.83	11,633	2.76	0.0	0.0	27,069.3	100.0	27,069.3	84.4	535.3	34.0	0.0	34.0	0.0	535.3	535.3
11,415	24.5	0.96	30,500	0.36	0.0	0.0	4,910.2	100.0	4,910.2	44.8	2,141.3	136.1	0.0	136.1	0.0	2,141.3	2,141.3
8,401	80.4	1.00	25,000	0.34	0.0	0.0	1,167.0	100.0	1,167.0	13.9	642.4	40.9	0.0	41.0	0.0	642.3	642.3
112,540	53.4	2.17	1,086,600	0.23	0.0	0.0	848.6	100.0	848.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5,470	97.0	1.56	34,370	0.25	520.5	34.4	993.6	65.6	1,514.1	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10,179	100.0	1.21	19,000	0.65	456.3	35.2	840.8	64.8	1,297.1	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11,953	76.8	1.59	105,854	0.18	10.6	34.1	20.5	65.9	31.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12,616	44.3	1.01	45,584	0.28	0.0	0.0	3,440.6	100.0	3,440.6	27.0	535.3	34.0	0.0	34.0	0.0	535.3	535.3
38,905	63.8	1.21	14,200	3.33	0.0	0.0	40,756.4	100.0	40,756.4	86.3	535.3	34.0	0.0	34.0	0.0	535.3	535.3
4,000	31.2	0.96	1,820	2.10	2,265.2	61.2	1,434.0	38.8	3,699.2	96.7	107.0	6.8	0.0	6.7	0.0	107.1	107.1
449,855	49.5	1.39	2,346,208	0.27	6,078.5	5.3	109,096.9	94.7	115,175.4	18.4	15,203.1	966.4	0.0	966.4	0.0	15,203.1	15,203.1

Table 5
 ASSESSED VALUATION AND TAX COLLECTIONS
 FISCAL YEAR 1988-89

Member Agencies	ASSESSED VALUATION - SECURED AND UNSECURED				Area 6/30/89 Acres	1988-89 Valuation Per Acre	Tax Assessments to Date	Adj. to Tax Assessments	Uncollected 6/30/89	Tax Collections
	1987-88 Total	1988-89 Total	1987-88 to 1988-89 Percent Change	1989-90 Total						
Bueno Colorado M.W.D.	\$ 3,253,711,801	\$ 3,727,447,729	14.6	\$ 4,471,133,007	19,802	\$188,236	\$ 4,057,376.00	\$ 312,731.00	\$ 34,977.31	\$ 4,335,129.69
Carlsbad M.W.D.	3,397,838,824	3,570,926,600	5.1	4,102,706,010	20,369	175,312	4,119,412.91	317,881.20	30,767.14	4,406,526.97
Coronado, City of (2)	0	0	0.0	0	0	0	0.00	0.00	0.00	0.00
De Luz Heights M.W.D.	52,318,440	49,684,360	- 5.0	53,828,772	11,789	4,214	87,004.65	4,361.76	1,012.78	90,353.63
Del Mar, City of	422,473,436	459,717,402	8.8	524,344,832	1,159	396,650	793,662.53	56,286.44	5,267.51	844,681.46
Escondido, City of	2,239,556,361	2,345,425,433	4.7	2,555,098,153	21,444	109,374	3,206,362.51	208,812.00	16,516.41	3,398,658.10
Fallbrook P.U.D.	771,474,608	825,387,469	7.0	950,597,192	16,199	50,953	1,301,237.89	90,190.57	9,160.69	1,382,267.77
Helix W.D.	6,510,134,509	6,723,213,945	3.3	7,292,453,070	31,278	214,950	13,238,040.31	746,356.33	60,213.61	13,924,183.03
National City, City of	840,535,388	844,611,323	0.5	891,693,211	5,573	151,554	2,067,007.58	98,376.70	6,471.76	2,158,912.52
Oceanside, City of	2,995,736,395	3,320,798,760	10.9	3,856,150,310	25,698	129,224	4,174,420.13	266,156.76	29,791.00	4,410,785.89
Olivenhain M.W.D.	2,304,160,023	2,611,724,064	13.3	3,136,390,840	30,815	84,755	2,103,192.39	174,965.13	22,630.70	2,255,526.82
Otay W.D.	3,005,019,934	3,342,911,362	11.2	3,984,277,437	63,063	53,009	3,262,074.15	230,504.81	31,738.58	3,460,840.38
Padre Dam M.W.D.	2,846,520,109	2,967,420,228	4.2	3,336,933,812	54,462	54,486	4,027,388.61	249,867.99	28,938.88	4,248,317.72
Pendleton Military Res.	3,544,561,657	121,243,037*	- 96.6	125,869,814	134,625	901	2,362,699.31	(79,265.58)	1,644.02	2,281,789.71
Poway, City of	1,568,466,256	1,767,715,363	12.7	2,077,256,920	23,214	76,149	2,012,527.74	128,531.43	11,189.87	2,129,869.30
Rainbow M.W.D.	869,176,746	915,125,159	5.3	1,045,086,381	47,237	19,373	1,420,218.68	98,167.24	10,419.64	1,507,966.28
Ramona M.W.D.	854,101,215	918,488,265	7.5	1,045,860,862	46,524	19,742	1,230,418.81	166,759.74	10,847.68	1,386,330.87
Rincon del Diablo M.W.D.	1,695,226,774	1,920,611,220	13.3	2,267,339,938	10,447	183,843	2,206,186.96	133,902.40	16,320.13	2,323,769.23
San Diego, City of (1)	43,216,944,091	45,487,581,636	5.3	50,792,933,056	210,717	215,870	63,416,212.47	(42,749,073.33)	82,481.37	20,584,657.77
San Dieguito W.D.	1,455,906,129	1,592,691,450	9.4	1,779,117,955	5,640	282,392	2,198,035.54	162,071.41	16,029.32	2,344,077.63
Santa Fe I.D.	1,972,270,275	2,151,067,655	9.1	2,411,306,258	10,179	211,324	2,685,716.30	266,184.42	21,393.97	2,930,506.75
South Bay I.D.	3,429,610,248	3,345,781,253*	- 2.4	3,600,046,541	15,569	214,900	7,011,207.83	(46,258.62)	26,468.04	6,938,481.17
Vallecitos M.W.D.	1,690,573,443	1,873,856,784	10.8	2,126,883,030	28,467	65,826	2,064,364.33	178,474.40	16,586.51	2,226,252.22
Valley Center M.W.D.	936,505,241	987,686,833	5.5	1,127,737,322	60,986	16,195	1,435,086.77	84,633.62	12,793.93	1,506,926.46
Yuima M.W.D.	120,908,790	121,860,374	0.8	131,208,117	12,813	9,511	289,509.17	14,801.31	1,342.01	302,968.47
Total Authority	\$89,993,730,693	\$91,992,977,704	2.2	\$103,686,252,840	908,069	\$101,306	\$130,769,363.57	(\$38,884,580.87)	\$505,002.86	\$91,379,779.84
San Diego County (1)	\$93,255,887,031	\$103,108,087,158	10.5	\$114,724,892,087	2,725,100	\$ 37,838				

(1) Excluding 1,450,000 acres of non-taxable land in San Diego County.

(2) Excluded from CWA.

TAX COLLECTIONS

1988-89

Member Agencies	ASSESSED VALUATION		Interest & Penalties	Receipts in Lieu of Taxes	Miscellaneous Tax	Net Total Collections	Amount Paid for Service Connections to 6/30/89	Total Amount Paid by Each Member Agency to 6/30/89
	1987-88	1988-89						
	Total	Tax Collections						
Bueno Colorado M.W.D.	\$ 3,253,711,801	\$ 3,733,129.69	\$ 31,223.27	\$ 10,802.62	\$ 123.67	\$ 4,382,141.39	\$ 207,438.59	\$ 4,589,579.98
Carlsbad M.W.D.	3,397,838,824	3,540,526.97	30,102.35	33,275.49	10.70	4,487,732.79	7,931.07	4,495,663.86
Coronado, City of (2)	0	0.00	0.00	186.64	0.15	4,179.25	0.00	4,179.25
De Luz Heights M.W.D.	52,318,440	90,353.63	869.35	1,000.00	0.00	92,353.64	0.00	92,353.64
Del Mar, City of	422,473,436	484,681.46	6,245.72	530.63	1.05	847,938.52	0.00	847,938.52
Escondido, City of	2,239,556,361	2,339,658.10	19,875.83	28.80	28.84	3,426,917.21	9,253.62	3,436,170.83
Fallbrook P.U.D.	771,474,608	832,267.77	8,292.38	3,420.09	43.10	1,393,376.99	67,773.04	1,461,150.03
Helix W.D.	6,510,134,509	6,792,183.03	59,519.01	4,930.57	783.52	13,992,634.96	28,905.90	14,021,540.86
National City, City of	840,535,388	815,912.52	7,499.38	6,828.33	96.07	2,168,693.85	0.00	2,168,693.85
Oceanside, City of	2,995,736,395	3,341,785.89	26,997.19	2,601.17	100.46	4,455,819.60	126,369.19	4,582,188.79
Olivenhain M.W.D.	2,304,160,023	2,625,526.82	18,890.62	1,250.00	0.00	2,295,245.68	89,024.26	2,384,269.94
Otay W.D.	3,005,019,934	3,346,840.38	22,279.16	4,455.25	45.44	3,495,011.90	208,573.68	3,703,585.48
Padre Dam M.W.D.	2,846,520,109	2,928,317.72	32,376.92	3,003.17	131.84	4,298,700.20	45,244.19	4,343,944.39
Pendleton Military Res.	3,544,561,657	1,281,789.71	0.00	0.00	0.00	2,416,570.00	0.00	2,416,570.00
Poway, City of	1,568,466,256	1,762,869.30	19,452.29	15.02	8.94	2,153,695.92	103,875.15	2,257,571.07
Rainbow M.W.D.	869,176,746	950,966.28	17,829.88	23,679.97	0.72	1,549,677.74	193,484.23	1,743,161.97
Ramona M.W.D.	854,101,215	938,330.87	13,247.59	5,400.02	58.79	1,410,164.73	3,378.93	1,413,543.66
Rincon del Diablo M.W.D.	1,695,226,774	1,932,769.23	15,639.45	58,800.96	1.36	2,402,429.43	14,527.34	2,416,956.77
San Diego, City of (1)	43,216,944,091	45,458,657.77	63,968.90	48,047,180.32	2,466.79	67,514,230.36	610,595.45	68,124,825.81
San Dieguito W.D.	1,455,906,129	1,534,077.63	11,891.97	5,426.06	131.25	2,360,286.28	47,205.63	2,407,491.91
Santa Fe I.D.	1,972,270,275	2,193,506.75	15,412.67	2,892.80	1,914.29	2,944,033.79	58,787.21	3,002,821.00
South Bay I.D.	3,429,610,248	3,393,481.17	22,528.59	629,977.08	143.26	7,582,626.63	0.00	7,582,626.63
Vallecitos M.W.D.	1,690,573,443	1,822,252.22	10,746.06	0.00	0.00	2,239,753.95	14,769.25	2,254,523.20
Valley Center M.W.D.	936,505,241	950,926.46	16,142.76	1,011.39	26.31	1,529,481.23	162,554.79	1,692,036.02
Yuima M.W.D.	120,908,790	130,968.47	1,709.12	1,500.00	0.00	305,423.17	28,424.47	333,847.64
Total Authority	\$89,993,730,693	\$91,9379,779.84	\$472,740.46	\$48,848,196.38	\$6,116.55	\$139,749,119.21	\$2,028,115.89	\$141,777,235.10
San Diego County (1)	\$93,255,887,031	\$ 103,1						

(1) Excluding 1,450,000 acres of non-taxable land in San Diego Co

(2) Excluded from CWA.

Table 6
WATER PRODUCTION WITHIN AUTHORITY AGENCIES - FISCAL YEAR 1977-78 TO 1988-89
(All Figures in Acre Feet)

Member Agencies	From Local and Authority Supplies										
	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
Bueno Colorado M.W.D.	14,554	15,038	17,565	15,446	14,720	18,351	16,988	17,584	17,928	18,781	20,457
Carlsbad M.W.D.	11,135	12,554	13,385	12,749	11,879	12,895	12,880	13,686	14,644	15,146	16,475
Del Mar, City of	1,096	999	1,075	1,045	1,055	1,235	1,097	1,107	1,456	1,481	1,474
De Luz Heights M.W.D.	990	1,339	1,757	1,794	1,792	2,531	2,373	2,586	3,186	2,459	3,042
Escondido, City of	20,500	22,113	26,052	22,534	20,269	24,214	23,281	23,712	24,913	24,871	26,950
Fallbrook P.U.D.	11,667	12,174	14,698	12,386	10,156	12,600	11,606	12,270	12,346	11,766	12,904
Helix W.D.	36,256	37,676	41,613	39,284	36,519	41,081	40,579	42,056	42,201	41,863	44,156
National City & South Bay I.D.	21,628	21,519	23,222	23,209	23,252	25,593	26,092	26,854	26,115	25,504	26,135
Oceanside, City of	18,310	19,602	22,408	21,769	19,846	22,583	24,114	24,190	25,164	25,889	27,693
Olivenhain M.W.D.	4,714	5,313	6,437	5,856	6,027	7,741	8,233	9,490	9,739	10,755	12,595
Otay W.D.	11,270	11,852	13,612	12,943	11,952	13,551	13,830	15,126	16,337	17,246	20,470
Padre Dam M.W.D.	12,812	13,718	15,572	14,908	14,102	16,992	17,027	17,966	18,319	18,121	20,167
Pendleton Military Res.	-	-	-	-	-	-	-	-	-	-	-
Poway, City of	6,948	8,240	9,027	7,873	7,547	9,215	9,320	10,061	10,822	11,601	13,039
Rainbow M.W.D.	24,709	26,943	34,111	28,630	25,354	31,374	29,297	29,887	29,822	28,389	32,055
Ramona M.W.D.	6,269	6,583	9,065	8,873	8,679	10,871	9,609	10,307	10,219	9,573	10,955
Rincon del Diablo M.W.D.	4,483	4,789	5,763	5,256	4,374	6,001	6,039	6,383	6,859	7,189	8,419
San Diego, City of	-	-	-	-	-	-	-	-	-	-	-
Inside City	164,934	175,668	191,713	192,626	182,873	203,642	216,289	221,873	228,796	229,334	239,332
Outside City (Not in Authority)	6,866	4,480	6,964	5,657	3,723	6,149	4,492	5,611	5,247	5,264	5,381
San Diego W.D.	7,170	7,342	8,056	7,668	7,298	7,670	7,956	7,904	8,300	8,205	8,559
Santa Fe I.D.	7,735	10,252	9,368	8,792	7,728	10,617	11,195	11,074	11,266	11,436	12,324
Vallecitos W.D.	6,559	6,800	8,420	8,233	7,847	9,654	10,090	10,932	11,161	11,385	12,742
Valley Center M.W.D.	29,417	33,568	44,687	38,358	32,583	42,367	39,435	41,419	43,791	40,224	47,243
Yuima M.W.D.	2,987	2,978	3,891	3,498	2,782	3,335	3,392	3,523	3,710	3,553	3,827
Total	433,009	461,540	528,461	499,387	462,357	540,262	545,214	565,601	582,341	580,035	626,394

Table 7
WATER SALES - FISCAL YEARS 1947 TO 1989
(All Figures Rounded to the Nearest Whole Acre Foot)

Member Agencies	From Local and Authority Supplies										Total
	1947-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	
Bueno Colorado M.W.D.	175,536	9,652	2,753	3,463	5,827	4,473	5,119	11,678	12,016	12,016	230,517
Carlsbad M.W.D.	193,380	12,749	11,879	12,895	12,829	13,677	14,671	15,157	16,388	16,388	303,625
Del Mar, City of	14,127	1,045	1,055	1,235	1,097	1,107	1,456	1,481	1,474	1,474	24,077
De Luz Heights M.W.D.	5,277	1,794	1,792	2,354	2,586	2,586	2,458	2,458	2,945	2,945	20,923
Escondido, City of	179,040	15,969	8,342	14,624	14,082	14,284	18,320	20,381	21,811	21,811	306,853
Fallbrook P.U.D.	302,847	12,363	10,168	12,600	11,600	11,600	13,555	11,622	12,932	12,932	400,009
Helix W.D.	678,890	29,577	22,898	24,779	36,507	37,972	39,732	37,267	40,642	40,642	948,264
National City & South Bay I.D.	365,360	315	132	87	4,863	20,817	16,384	20,514	19,519	19,519	447,991
Oceanside, City of	265,478	21,726	19,821	22,583	24,114	24,190	25,164	25,889	27,693	27,693	456,658
Olivenhain M.W.D.	49,219	5,739	5,714	7,860	8,233	9,485	9,739	10,742	12,595	12,595	119,328
Otay W.D.	188,197	12,943	11,952	13,542	13,830	15,125	16,337	17,246	20,470	20,470	309,642
Padre Dam M.W.D.	174,614	14,908	14,102	16,992	17,027	17,966	18,319	18,121	20,167	20,167	312,216
Poway, City of	910	715	1,356	1,694	1,542	95	111	118	108	108	6,649
Rainbow M.W.D.	116,453	8,351	6,841	9,005	9,313	9,821	10,724	11,548	12,817	12,817	194,873
Ramona M.W.D.	403,260	28,630	25,426	31,374	29,160	29,211	30,323	28,240	32,181	32,181	637,805
Santa Fe I.D.	61,178	8,541	8,092	10,392	8,688	9,723	9,943	9,526	11,385	11,385	138,068
Rincon del Diablo M.W.D.	140,046	5,256	4,374	6,001	6,039	6,383	6,858	7,188	8,419	8,419	190,564
San Diego, City of	3,217,950	155,743	90,841	114,473	170,344	183,903	197,865	215,440	232,439	232,439	4,579,098
San Diego W.D.	91,272	4,573	4,099	4,520	3,291	3,227	3,937	4,381	5,779	5,779	124,989
Santa Fe I.D.	99,962	5,278	4,426	5,895	4,488	4,668	5,268	6,019	8,303	8,303	144,307
Vallecitos W.D.	83,200	8,154	7,847	9,654	10,135	10,941	11,145	11,380	12,743	12,743	165,199
Valley Center M.W.D.	357,098	38,091	32,383	42,247	38,953	41,055	43,511	39,937	47,105	47,105	680,580
Yuima M.W.D.	34,511	2,205	1,403	1,333	1,885	1,924	1,911	1,442	1,484	1,484	48,098
Total Sales to Agencies	7,197,805	404,317	297,806	369,779	436,201	474,955	503,678	527,775	582,012	582,012	10,794,328
Total Sales to Others	56,509	0	0	0	0	0	0	0	0	0	56,810
Total to Authority Storage	334,181	14,560	9,100	452	645	13,158	15,849	3,722	3,651	3,651	395,318
Total from Authority Storage	(300,831)	0	(7,383)	0	0	0	(116)	0	(163)	(163)	(308,493)
Total to Metropolitan Storage	120,929	0	0	0	0	230	0	28,899	31,244	31,244	181,302
Total from Metropolitan Storage	(116,908)	0	0	0	0	(219)	0	(7,555)	(19,927)	(19,927)	(144,609)
Total Flow in Authority System	7,291,685	418,877	299,523	370,231	436,846	488,124	519,411	552,841	597,117	597,117	10,974,655
Average Rate of Flow (c.f.s.)	558.5	411.3	509.4	602.5	656.0	695.7	727.0	804.3	804.3	804.3	804.3
To Agencies and Others	20.1	12.6	0.6	0.9	18.2	21.9	5.1	5.0	5.0	5.0	5.0
To Authority Storage	0.0	(10.2)	0.0	0.0	0.0	(0.2)	0.0	0.0	0.0	0.0	(0.2)
From Authority Storage	0.0	0.0	0.0	0.0	0.0	0.3	0.0	39.8	43.2	43.2	43.2
To Metropolitan Storage	0.0	0.0	0.0	0.0	0.0	(0.3)	0.0	(10.4)	(27.5)	(27.5)	(27.5)
From Metropolitan Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow in Authority System	578.6	413.7	510.0	603.4	674.2	717.4	761.5	824.8	824.8	824.8	824.8

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

SAN DIEGO COUNTY WATER AUTHORITY

Table 8
SALES OF IMPORTED WATER—FISCAL YEAR 1988-89
(All Figures in Acre Feet except as noted)

Member Agencies	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	6 Month Total 1988
Buena Colorado M.W.D.	2,308.2	2,244.0	1,022.0	573.8	1,138.1	1,077.6	8,363.7
Carlsbad M.W.D.	1,886.3	1,797.4	1,674.9	1,517.3	1,003.4	893.5	8,772.8
Del Mar, City of	190.5	190.5	185.6	117.7	75.7	27.7	787.7
De Luz Heights M.W.D.	379.3	415.3	407.4	320.9	146.7	110.7	1,780.3
Escondido, City of	2,091.4	2,296.5	1,969.6	1,534.2	133.0	1,068.5	9,093.2
Fallbrook P.L.D.	1,542.2	1,559.4	1,351.6	1,091.3	602.5	463.6	6,610.6
Helix W.D.	3,786.5	3,703.3	3,350.4	3,244.6	3,003.8	2,736.5	19,825.1
National City & South Bay I.D.	1,184.1	1,154.6	420.2	2,096.4	1,693.3	1,624.0	8,172.6
Oceanside, City of	3,005.0	2,948.4	2,729.0	2,526.1	1,783.3	1,676.0	14,667.8
Olivenhain M.W.D.	1,528.5	1,517.8	1,331.4	1,109.5	697.4	624.4	6,809.0
Otay W.D.	2,247.7	2,144.4	2,099.0	1,868.7	1,210.8	1,092.0	10,662.6
Padre Dam M.W.D.	2,342.2	2,319.9	2,023.7	1,812.1	1,258.0	1,071.2	10,827.1
Pendleton Military Res.	14.0	13.3	8.4	4.6	6.7	4.3	51.3
Poway, City of	1,476.4	1,377.0	1,289.3	1,296.4	702.3	654.1	6,795.5
Rainbow M.W.D.	4,004.4	3,773.7	4,253.3	3,383.5	1,623.2	1,248.9	18,287.0
Ramona M.W.D.	1,325.1	1,332.0	1,331.5	1,191.9	581.6	580.8	6,342.9
Rincon del Diablo M.W.D.	964.6	944.7	938.2	794.1	489.0	436.8	4,567.4
San Diego, City of	23,601.7	23,432.9	23,953.3	18,899.6	13,362.9	9,952.2	113,202.6
San Dieguito W.D.	595.7	748.0	524.6	505.4	279.0	213.3	2,866.0
Santa Fe I.D.	992.3	1,163.6	831.0	751.0	311.9	220.4	4,270.2
Vallecitos	1,422.9	1,400.3	1,345.0	1,190.1	817.0	761.7	6,937.0
Valley Center M.W.D.	5,988.1	5,974.0	5,903.9	4,879.6	2,460.7	1,944.7	27,151.0
Yuima M.W.D.	209.3	189.3	209.3	152.0	105.0	124.3	989.2
Total Sales to Agencies	63,086.4	62,640.3	59,152.6	50,860.8	33,485.3	28,607.2	297,832.6
Total Sales to Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Sales to Agencies and Others	63,086.4	62,640.3	59,152.6	50,860.8	33,485.3	28,607.2	297,832.6
Total to Authority Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total from Authority Storage ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total to Metropolitan Storage .	0.0	0.0	0.0	5,573.6	6,006.3	5,369.8	16,949.7
Total from Metropolitan Storage (1,991.9)	(2,422.0)	(327.7)	(238.6)	0.0	(31.4)	(5,011.6)	
Total Flow in Authority System	61,094.5	60,218.3	58,824.9	56,195.8	39,491.6	33,945.6	309,770.7
Total Evaporation Losses from Storage in San Vicente	318.4	302.3	264.7	196.7	99.4	72.7	1,254.2
Total Evaporation M.W.D./C.W.A. from Pre-Delivered Storage Program in El Capitan, Henshaw, Sweetwater Reservoirs and San Vicente .	502.3	357.4	236.4	178.8	127.2	144.0	1,546.1
Rate of Flow To Agencies and Others	1,026.0	1,018.7	994.1	827.2	562.7	465.3	816.1
To Authority Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
From Authority Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0
To Metropolitan Storage	0.0	0.0	0.0	90.6	100.9	87.3	46.4
From Authority Storage	(32.4)	(39.4)	(5.5)	(3.9)	0.0	(0.5)	(13.7)
In Authority System	993.6	979.4	988.6	913.9	663.7	552.1	848.8

TABLES

Table 8
(Continued)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Total 6 Months 1989	Fiscal Year Total	Fiscal Year C.F.S.
527.2	101.4	205.3	1,157.6	794.5	866.4	3,652.4	12,016.1	16.60
897.7	847.9	1,140.8	1,409.8	1,651.2	1,667.5	7,614.9	16,387.7	22.64
74.9	73.6	114.3	116.6	149.3	157.4	686.1	1,473.8	2.04
90.4	67.1	140.9	252.6	255.3	358.1	1,164.4	2,944.7	4.07
1,329.5	1,335.0	1,855.0	2,380.4	2,770.5	3,047.2	12,717.6	21,810.8	30.13
407.1	343.8	632.2	1,338.9	1,629.0	1,969.9	6,320.9	12,931.5	17.86
2,564.2	2,399.8	3,220.4	4,026.6	4,212.4	4,393.0	20,816.4	40,641.5	56.14
1,451.8	1,422.8	1,836.8	2,121.2	2,240.9	2,272.8	11,346.3	19,518.9	26.96
1,541.0	1,400.3	2,010.0	2,514.4	2,647.7	2,911.8	13,025.2	27,693.0	38.25
591.1	545.6	895.7	1,139.9	1,286.7	1,326.9	5,785.9	12,594.9	17.40
1,099.8	1,037.8	1,553.7	1,891.0	1,954.7	2,270.1	9,807.1	20,469.7	28.27
1,048.1	955.0	1,424.3	1,772.5	1,967.7	2,172.7	9,340.3	20,167.4	27.86
6.0	6.3	9.5	8.5	12.2	13.9	56.4	107.7	0.15
674.7	579.4	937.7	1,088.7	1,335.0	1,406.4	6,021.9	12,817.4	17.70
1,089.0	884.4	1,784.5	3,236.3	3,190.3	3,709.4	13,893.9	32,180.9	44.45
472.6	410.7	767.8	1,254.8	1,301.1	1,434.8	5,641.8	11,984.7	16.55
421.7	365.3	556.1	745.4	842.0	920.7	3,851.2	8,418.6	11.63
11,490.7	11,581.8	16,946.9	22,950.9	24,275.4	31,990.7	119,236.4	232,439.0	321.06
268.7	496.6	498.5	536.4	572.0	540.8	2,913.0	5,779.0	7.98
272.8	481.2	662.2	821.5	905.9	888.7	4,032.3	8,302.5	11.47
710.0	687.2	880.4	1,055.7	1,159.2	1,313.1	5,805.6	12,742.6	17.60
1,379.7	1,243.7	2,704.2	4,290.2	4,589.6	5,747.0	19,954.4	47,105.4	65.07
0.0	0.0	33.2	142.0	128.9	190.8	494.9	1,484.1	2.05
28,408.7	27,266.7	40,810.4	56,251.9	59,871.5	71,570.1	284,179.3	582,011.9	803.92
0.0	0.0	0.0	0.0	300.7	0.0	300.7	300.7	0.42
28,408.7	27,266.7	40,810.4	56,251.9	60,172.2	71,570.1	284,480.0	582,312.6	804.34
0.0	0.0	0.0	0.0	571.8	3,079.0	3,650.8	3,650.8	
0.0	0.0	0.0	0.0	(19.9)	(143.2)	(163.1)	(163.1)	
3,934.9	6,105.9	4,253.7	0.0	0.0	0.0	14,294.5	31,244.2	
0.0	0.0	(63.8)	(1,138.5)	(1,014.2)	(12,699.1)	(14,915.6)	(19,927.2)	
32,343.6	33,372.6	45,000.3	55,113.4	59,709.9	61,806.8	287,346.6	597,117.3	
78.1	78.1	156.1	228.3	251.4	281.4	1,073.4	2,327.6	
166.2	174.8	345.3	511.0	501.3	578.7	2,277.3	3,823.4	
462.0	491.0	663.7	945.3	978.6	1,202.8	792.4	804.3	
0.0	0.0	0.0	0.0	9.3	51.7	10.2	5.0	
0.0	0.0	0.0	0.0	(0.3)	(2.4)	(0.5)	(0.2)	
64.0	109.9	69.2	0.0	0.0	0.0	39.8	43.2	
0.0	0.0	(1.0)	(19.1)	(16.5)	(213.4)	(41.5)	(27.5)	
526.0	600.9	731.9	926.2	971.1	1,038.7	800.4	824.8	

SAN DIEGO COUNTY WATER AUTHORITY

Table 9
ASSESSED VALUATIONS AND TAX RATES
Fiscal Years 1945-46 to 1988-89

Fiscal Year	Secured Property	Public Utilities	Unsecured Property	Total	Tax Rate per \$100	
					Secured	Unsecured
1945-46	\$ 212,082,975	\$ 28,253,700	\$ 29,960,130	\$ 270,296,805	0.04	—
1946-47	208,715,150 (1)	29,433,450	30,665,910	268,814,510	0.04	0.04
1947-48	233,379,990	32,740,680	40,977,850	307,298,520 (2)	0.14	0.04
1948-49	254,227,570	37,482,020	47,177,300	338,886,890	0.14	0.14
1949-50	290,351,875	42,429,140	45,743,200	378,524,215	0.10	0.14
1950-51	306,104,930	43,595,730	44,717,740	394,418,400	0.10	0.10
1951-52	344,620,030	48,452,940	50,904,035	443,977,005	0.10	0.10
1952-53	382,948,860	53,208,220	63,996,330	500,153,410	0.12	0.10
1953-54	490,709,350	63,092,050	69,147,150	622,948,550	0.10	0.12
1954-55	546,272,880	69,243,550	79,629,790	695,146,220	0.10	0.10
1955-56	627,062,960	87,485,390	79,936,450	794,484,800	0.09	0.10
1956-57	680,824,400	101,224,260	97,950,800	879,999,460	0.09	0.09
1957-58	761,088,330	111,151,890	128,785,440	1,001,025,660	0.09	0.09
1958-59	865,283,080	128,479,290	128,124,720	1,121,887,090	0.10	0.09
1959-60	979,491,050	145,317,290	134,846,730	1,259,655,070	0.11	0.10
1960-61	1,116,723,830	165,666,720	159,954,740	1,442,345,290	0.11	0.11
1961-62	1,220,810,650	191,276,650	155,149,890	1,567,237,190	0.11	0.11
1962-63	1,272,506,330	201,245,370	154,989,440	1,628,741,140	0.11	0.11
1963-64	1,340,197,170	209,793,780	159,714,930	1,709,705,880	0.11	0.11
1964-65	1,423,375,590	213,352,470	151,686,520	1,786,414,580	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	231,191,301	306,608,099	3,275,533,487	0.10	0.09
1972-73	3,061,010,163	225,224,650	347,857,938	3,634,092,751	0.11	0.10
1973-74	3,481,734,258	239,346,070	393,300,174	4,114,380,482	0.11	0.11
1974-75	4,075,823,685	249,562,970	450,374,627	4,775,761,282	0.11	0.11
1975-76	4,629,303,071	283,156,410	503,493,823	5,415,953,304	0.11	0.11
1976-77	5,230,851,497	311,553,680	545,425,038	6,087,830,215	0.11	0.11
1977-78	6,121,864,014	376,899,840	607,393,849	7,106,157,703	0.11	0.11
1978-79	6,272,490,327	554,099,470	707,294,537	7,533,884,334	0.06	0.11
1979-80	7,624,459,863	660,454,810	837,758,367	9,122,673,040	0.04	0.06
1980-81	9,163,752,692	731,869,180	483,834,623	10,379,456,495	0.05	0.04
1981-82 (4)	41,759,646,912	3,457,486,860	1,692,548,096	46,889,681,868	0.01	0.0125
1982-83	46,670,563,147	4,136,558,170	1,971,803,569	52,778,924,886	0.00817	0.01
1983-84	50,057,533,413	5,275,693,400	2,190,834,774	57,524,061,587	0.004605	0.00817
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	6,086,772,100	2,856,824,972	71,388,143,316	0.005310	0.007090
1986-87	70,584,788,216	7,095,945,340	2,952,629,417	80,633,362,973	0.00461	0.005310
1987-88	78,866,134,523	7,486,884,810	3,660,711,360	89,993,730,693	0.004	0.00461
1988-89 (5)	87,712,729,304	91,081,209	4,189,167,191	91,992,977,704	0.00403	0.004

(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.

(5) Public utilities assessed valuation and procedures revised by State Board of Equalization.

TABLES

Table 9
(Continued)
TAX LEVIES AND TAX COLLECTIONS BY FISCAL YEAR
(Includes in Lieu of Taxes)
Fiscal Years 1945-46 to 1988-89

Tax Levy (3)	Collection of Current Years' Taxes During Fiscal Year	Percentage of Levy Collected During Fiscal Year	Adjustments to Prior Years' Levies	Collection of Prior Years' Taxes During Fiscal Year	Total Tax Collections	Accumulated Delinquent Taxes	Ratio Accumulated Delinquent Taxes to Tax Levy
107,808	105,753	98.09	—	1,090	106,844	2,439	2.26
389,591	381,563	97.94	—	1,882	383,445	8,585	2.20
474,520	459,504	96.84	—	5,916	465,420	17,685	3.73
401,112	392,732	97.91	329	13,342	406,074	13,052	3.25
397,970	390,274	98.07	373	8,217	398,492	12,904	3.24
450,405	441,242	97.97	978	7,699	448,941	15,346	3.40
594,603	585,417	98.46	(1,140)	12,567	597,985	10,824	1.82
652,335	640,239	98.15	4,213	9,942	650,181	17,191	2.62
709,678	695,200	97.96	1,295	12,638	707,838	20,326	2.86
803,375	788,734	97.41	(2,099)	12,140	800,874	20,726	2.59
874,774	861,461	98.48	576	13,056	874,517	21,560	2.46
965,006	946,445	98.08	958	12,890	959,335	28,189	2.92
1,178,885	1,157,265	98.17	—	13,347	1,170,613	36,462	3.09
1,436,270	1,408,277	98.05	(5,274)	16,647	1,424,925	42,533	2.97
1,624,733	1,586,169	97.63	(8,720)	21,501	1,607,671	50,874	3.15
1,763,785	1,718,575	97.44	(2,276)	31,477	1,750,053	62,330	3.54
1,816,449	1,775,932	97.77	(3,688)	38,134	1,814,066	61,023	3.37
1,910,019	1,862,973	97.54	(268)	36,825	1,899,799	70,975	3.72
2,000,067	1,948,853	97.44	(6,588)	42,596	1,991,450	73,003	3.66
2,101,023	2,033,032	96.76	2,503	44,784	2,077,816	98,714	4.69
2,154,994	2,090,637	97.01	(7,164)	54,333	2,144,970	101,573	4.73
2,175,276	2,129,996	97.92	(301)	64,473	2,194,470	82,078	3.77
2,110,913	2,103,601	99.65	—	55,253	2,158,854	34,136	1.62
2,182,274	2,149,330	98.49	91,680	24,018	2,204,127	103,963	4.52
2,450,123	2,408,899	98.32	38,500	104,032	2,512,932	79,655	3.25
3,084,869	3,058,713	99.15	27,045	32,926	3,091,639	99,930	3.24
3,790,191	3,743,715	98.77	494	45,314	3,789,029	101,586	2.68
4,004,024	3,941,152	98.43	4,891	43,846	3,984,999	125,502	3.13
4,673,400	4,597,610	98.37	(4,573)	42,611	4,640,222	154,107	3.32
5,336,375	5,223,483	97.88	(17,845)	76,632	5,300,115	172,522	3.23
6,012,954	5,928,085	98.59	34,543	109,718	6,037,803	182,216	3.03
7,111,999	7,083,080	99.59	(6,021)	87,193	7,170,273	117,921	1.66
5,956,033	5,802,438	97.42	—	134,444	5,936,882	137,027	2.30
5,549,222	5,420,190	97.67	(105,757)	137,072	5,557,262	23,275	0.42
7,164,231	7,076,598	97.78	181,346	137,782	7,214,380	154,472	2.16
7,150,025	6,886,178	96.31	73,743	228,215	7,114,393	213,847	3.09
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	176,805	283,045	7,322,653	298,895	4.13
7,181,483	7,092,760	98.76	40,938	158,696	7,251,456	269,860	3.76
6,269,310	6,053,170	96.55	53,304	166,944	6,220,114	172,360	5.94
6,309,666	6,057,897	96.01	95,635	462,995	6,520,892	251,769	3.99
6,044,731	6,106,942	90.84	380,264	180,037	6,286,979	389,785	6.44

Table 10
 SAN JACINTO TUNNEL WEST PORTAL
 CHEMICAL CHARACTERISTICS OF NATURAL COLORADO RIVER WATER
 Year Ending June 30, 1989
 Samples Taken at Entrance to San Diego Aqueduct by M.W.D.
 and Analysis by District Laboratory

Month	Total Hardness as mg/l CaCO ₃	Alkalinity as mg/l CaCO ₃ Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					*F	*C
July	273	130	25.0	8.42	79	26
August	272	129	25.5	8.45	79	26
September	268	127	25.0	8.42	77	25
October	275	130	25.5	8.36	73	23
November	275	131	25.5	8.25	68	20
December	279	131	26.5	8.35	61	16
January	279	134	26.0	8.41	54	12
February	277	130	26.0	8.31	50	10
March	279	135	26.0	8.42	57	14
April	284	131	26.5	8.40	63	17
May	288	131	27.0	8.46	72	22
June	293	134	27.5	8.44	75	24

Table 11
 CHEMICAL CHARACTER OF BLENDED TREATED WATER
 AT LAKE SKINNER
 Year Ending June 30, 1989
 Samples Taken by M.W.D. and Analyzed by District Laboratory

Month	Total Hardness as mg/l CaCO ₃	Alkalinity as mg/l CaCO ₃ Total	Magnesium as mg/l	(PH) Hydrogen Ion Concentration	Temperature When Sampled	
					*F	*C
July	218	114	21.8	8.09	79	26
August	220	114	22.0	8.06	79	26
September	218	113	22.0	8.07	77	25
October	219	112	22.3	8.07	73	23
November	234	118	23.5	8.08	68	20
December	257	127	24.8	8.17	59	15
January	269	123	25.5	8.07	54	12
February	258	126	25.0	8.06	54	12
March	241	114	24.0	8.04	59	15
April	188	99	20.8	8.03	63	17
May	185	102	20.0	7.99	68	20
June	199	102	20.5	8.04	73	23

ANALYSIS—YEAR ENDING JUNE 30, 1989
 (mg/l Except PH, Conductivity, and Temperature)

Constituents	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO ₂)	8.9	9.7	7.1
Calcium	(Ca)	69	66	72
Magnesium	(Mg)	26	25.0	27.5
Sodium	(Na)	78	82	75
Potassium	(K)	4.1	5.0	3.8
Carbonate	(CO ₃)	1	2	0
Bicarbonate	(HCO ₃)	159	163	150
Sulfate	(SO ₄)	223	231	218
Chloride	(Cl)	64	71	50
Nitrate	(NO ₃)	0.60	0.95	0.10
Fluoride	(F)	0.28	0.29	0.26
Boron	(B)	0.10	0.14	0.07
Total Dissolved Solids		553	579	540
Hardness as CaCO ₃ —Total		279	293	268
Alkalinity—Total		131	135	127
Free Carbon Dioxide	(CO ₂)	1.1	1.5	0.9
Hydrogen Ion Concentration	(PH)	8.39	8.46	8.25
Electrical Conductivity EC x 10 ⁶ @ 25°C		882	917	864
Temperature °C		20	26	10

ANALYSIS—YEAR ENDING JUNE 30, 1989
 (mg/l Except PH, Conductivity, and Temperature)

Constituents	Symbol	ANALYSIS		
		Average	Maximum	Minimum
Silica	(SiO ₂)	9.5	11.1	8.2
Calcium	(Ca)	53	66	41
Magnesium	(Mg)	22.7	25.5	20.8
Sodium	(Na)	77	72	81
Potassium	(K)	3.9	4.2	3.7
Carbonate	(CO ₃)	0	0	0
Bicarbonate	(HCO ₃)	139	155	120
Sulfate	(SO ₄)	166	214	123
Chloride	(Cl)	82	98	69
Nitrate	(NO ₃)	0.50	1.00	0.08
Fluoride	(F)	0.17	0.26	0.12
Boron	(B)	0.13	0.16	ND
Total Dissolved Solids		483	540	423
Hardness as CaCO ₃ —Total		226	269	185
Alkalinity—Total		114	127	99
Free Carbon Dioxide	(CO ₂)	2.0	1.8	2.2
Hydrogen Ion Concentration	(PH)	8.06	8.17	7.99
Electrical Conductivity EC x 10 ⁶ @ 25°C		802	872	724
Temperature °C		20	26	12

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	-	1,654,401,890	.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	6,548,792,114	.23	.25
1955-56	1,876,256	8,514,868,335	.21	.23
1956-57	1,932,205	9,674,000,560	.19	.21
1957-58	2,046,189	11,235,906,510	.18	.19
1958-59	2,128,333	12,070,838,070	.18	.18
1959-60	2,171,290	12,714,205,470	.17	.18
1960-61	2,544,960	13,737,971,925	.16	.17
1961-62	2,647,014	14,803,202,587	.15	.16
1962-63	2,797,946	15,699,681,030	.14	.15
1963-64	2,825,306	17,261,412,395	.14	.14
1964-65	2,882,144	17,757,246,740	.14	.14
1965-66	2,890,266	19,143,157,788	.14	.14
1966-67	2,901,421	20,979,150,165	.14	.14
1967-68	3,061,885	22,732,157,500	.14	.14
1968-69	3,067,896	24,016,568,274	.16	.14
1969-70	3,072,038	25,572,510,561	.17	.16
1970-71	3,075,616	27,605,064,302	.17	.17
1971-72	3,093,303	29,023,413,462	.17	.17
1972-73	3,126,803	31,001,520,641	.15	.17
1973-74	3,127,680	32,838,476,378	.14	.15
1974-75	3,129,664	35,941,961,265	.14	.14
1975-76	3,132,012	39,585,365,754	.13	.14
1976-77	3,132,800	45,695,542,697	.12	.13
1977-78	3,267,533	51,268,796,300	.12	.12
1978-79	3,268,337	53,573,470,118	.10	.12
1979-80	3,270,880	64,119,383,253	.09	.10
1980-81	3,272,679	69,390,300,019	.079	.09
1981-82	3,273,339	114,726,854,882 (3)	.0198%(3)	.0198%(3)
1982-83	3,277,011	153,335,259,307	.0166%	.0166%
1983-84	3,280,294	179,788,761,242	.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	3,286,400	505,419,663,679	.0148%	.0164%
1987-88	3,287,309	564,692,806,207	.0112%	.0148%
1988-89	3,288,247	596,900,358,958	.0110%	.0112%
1989-90	-	671,699,558,661	.0121%	.0110%

(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	Remaining Balance at 6/30/89
Annexation Charges Outstanding		
Del Mar, City of	11-23-62	\$ 81,065.69
De Luz M.W.D.	6-28-67	3,341,937.33*
No. 1 Annexation of 1969	10-15-69	605,565.74*
Fallbrook P.U.D.		
No. 2 Annexation of 1958	11-24-58	0
Fallbrook Community Air Park	12-22-69	94,473.62*
Helix Water District		
Helix-Watson Ranch Annexation	2-20-59	255.58
Helix-Sunny Slope Hts. Annexation	9-17-59	1,257.25
Olivenhain M.W.D.	7-25-60	4,909.15
No. 1 Annexation of 1965	2-11-65	119,477.11
No. 4 Annexation of 1967	11-13-67	51,968.56
Otay W.D.		
No. 3 Annexation of 1960	10-20-60	6,179.35
Padre Dam M.W.D.		
No. 2 Annexation of 1959	11-6-59	3,548.59
No. 3 Annexation of 1960	10-17-60	19,054.52
No. 4 Annexation of 1970	8-3-70	102,210.04
Poway, City of		
No. 1 Annexation of 1959	9-21-59	856.37
Rainbow M.W.D.		
No. 1 Annexation of 1959	5-12-59	798.66
No. 3 Annexation of 1967	12-6-67	3,431,428.20*
No. 5 Annexation of 1973	11-22-73	9,861.79
Ramona M.W.D.	8-27-57	0
No. 1 Annexation of 1959	5-29-59	1,398.37
No. 2 Annexation of 1961	9-22-61	1,540.87
No. 3 Annexation of 1963	9-20-63	1,759.50
No. 4 Annexation of 1967	11-27-67	483,726.82
No. 5 Annexation of 1972	5-17-72	566,550.55
Rincon del Diablo M.W.D.		
No. 4 Annexation of 1972	11-2-72	27,151.77*
San Dieguito W.D.		
No. 1 Annexation of 1959	9-15-59	2,342.37
No. 2 Annexation of 1972	12-8-72	154,234.07*
Valley Center M.W.D.		
No. 1 Annexation of 1960	12-12-60	1,563.64
No. 2 Annexation of 1967	11-29-67	25,764.28
No. 3 Annexation of 1967	11-30-67	588,229.21
Yuima M.W.D.	12-16-63	124,860.97
No. 1 Annexation of 1967	11-21-67	39,338.74
No. 2 Annexation of 1969	11-24-69	11,420.14
Pendleton Military Res.-Nuclear Generating Plant	12-16-77	1,885,074.73
Total		\$11,789,803.58
Annexation charges received from other annexed areas not listed above having no remaining balance		\$22,765,728.00

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

SAN DIEGO COUNTY WATER AUTHORITY

Table 14
WATER SALES BY METROPOLITAN WATER DISTRICT
Fiscal Years 1941-42 to 1988-89

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	9,443.3
1942-43	0	0	14,457.8	100	14,457.8	2,626.4	17,084.2
1943-44	0	0	15,874.9	100	15,874.9	3,301.8	19,176.7
1944-45	0	0	30,591.3	100	30,591.3	1,715.7	32,307.0
1945-46	0	0	46,685.8	100	46,685.8	1,264.2	47,950.0
1946-47	0	0	59,861.8	100	59,861.8	524.0	60,385.8
1947-48	41,093.5	36	71,995.4	64	113,088.9	116.8	113,255.7
1948-49	71,642.6	49	73,237.1	51	144,879.7	128.4	145,008.1
1949-50	69,308.0	49	72,936.0	51	142,244.0	23,371.6	165,615.6
1950-51	75,000.9	54	63,493.1	46	138,494.0	26,978.6	165,472.6
1951-52	66,674.3	44	84,616.1	56	151,290.4	42,464.2	193,754.6
1952-53	30,845.3	24	99,589.6	76	130,434.9	31,682.4	162,117.3
1953-54	120,773.0	51	115,550.6	49	236,323.6	7,820.7	244,144.3
1954-55	192,544.7	59	134,923.3	41	327,468.0	58,184.5	385,652.5
1955-56	190,337.2	53	169,506.4	47	359,843.6	45,562.9	405,406.5
1956-57	286,059.1	60	191,110.7	40	477,169.8	66,074.1	543,243.9
1957-58	266,024.1	57	197,900.0	43	463,935.1	75,612.8	539,547.9
1958-59	244,354.2	46	282,248.1	54	526,602.3	74,107.1	600,709.4
1959-60	425,019.0	58	304,874.8	42	729,893.8	3,523.2	733,417.0
1960-61	594,521.1	64	335,207.2	36	929,728.3	4,099.4	933,827.7
1961-62	608,811.0	66	312,975.9	34	921,786.9	3,676.9	925,463.8
1962-63	668,881.8	66	348,092.6	34	1,016,974.4	3,677.0	1,020,651.4
1963-64	671,853.4	63	388,553.9	37	1,060,407.3	3,776.7	1,064,184.0
1964-65	645,577.3	58	471,042.0	42	1,116,619.3	5,035.3	1,121,654.6
1965-66	550,630.8	52	503,424.9	48	1,054,055.7	4,821.8	1,058,877.5
1966-67	523,141.2	50	531,659.7	50	1,054,800.9	4,513.0	1,059,313.9
1967-68	514,248.1	48	557,730.9	52	1,071,979.0	4,934.9	1,076,913.9
1968-69	455,174.3	43	599,237.7	57	1,054,412.0	2,232.4	1,056,644.4
1969-70	482,256.9	41	692,846.4	59	1,165,103.3	650.0	1,165,753.3
1970-71	520,983.9	46	612,511.6	54	1,133,495.5	150.3	1,133,645.8
1971-72	590,356.9	47	656,635.9	53	1,246,992.8	549.6	1,247,542.4
1972-73	569,290.7	48	606,120.4	52	1,175,411.1	4.3	1,175,415.4
1973-74*	655,058.0	52	593,180.0	48	1,248,238.0	955.0	1,249,193.0
1974-75*	721,970.0	54	607,013.0	46	1,328,983.0	653.0	1,329,636.0
1975-76*	735,100.0	53	653,154.0	47	1,388,254.0	994.0	1,389,248.0
1976-77*	560,124.0	40	829,773.0	60	1,389,897.0	569.0	1,390,466.0
1977-78*	508,036.0	40	757,270.0	60	1,265,306.0	22,019.0	1,287,325.0
1978-79*	434,455.0	35	777,173.0	65	1,211,628.0	24,256.0	1,235,884.0
1979-80	438,414.0	34	843,800.0	66	1,282,214.0	2,620.0	1,284,834.0
1980-81	487,833.0	33	975,177.0	67	1,463,010.0	588.0	1,463,598.0
1981-82	562,650.0	37	940,660.0	63	1,503,310.0	989.0	1,504,299.0
1982-83	314,190.0	26	912,172.0	74	1,226,362.0	207.0	1,226,569.0
1983-84	364,608.5	26	1,062,123.5	74	1,426,732.0	1,210.0	1,427,942.0
1984-85	455,061.0	29	1,119,443.0	71	1,574,806.0**	934.0	1,575,740.0
1985-86	500,955.0	30	1,145,856.0	70	1,646,851.0**	346.0	1,647,197.0
1986-87	568,812.9	31	1,252,783.6	69	1,825,921.5**	1,508.0	1,827,429.5
1987-88	598,722.0	31	1,322,484.0	69	1,926,702.0**	675.0	1,927,377.0
1988-89	745,767.3	35	1,362,428.6	65	2,108,195.9**	694.0	2,108,889.9

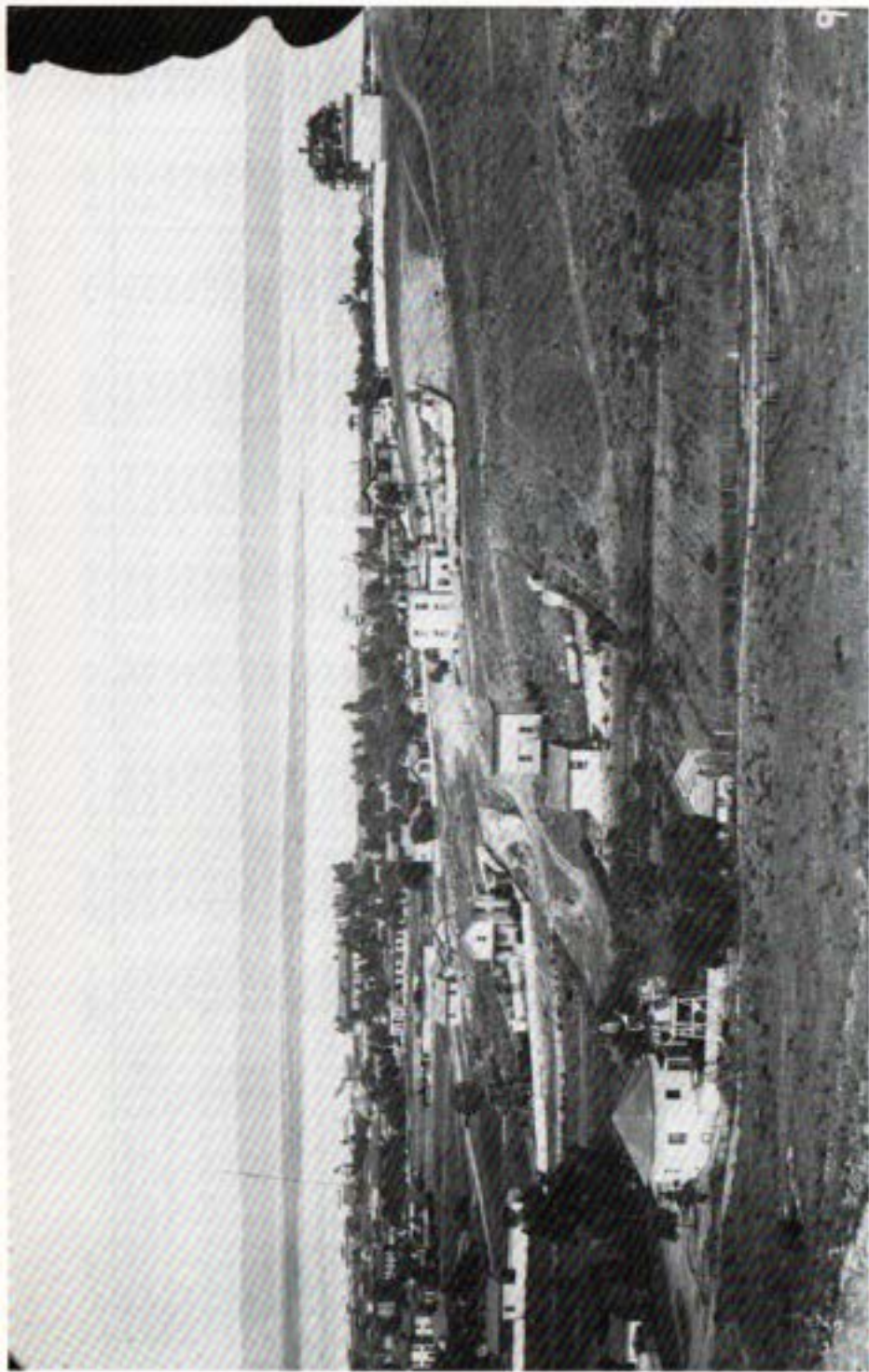
*Revised

**Includes deliveries of reclaimed water to Las Virgenes, Coastal MWD, Long Beach, and MWD of Orange Co.

TABLES

Table 15
WATER PRODUCTION - METROPOLITAN WATER DISTRICT CONSTITUENT AREAS
Figures Furnished by Metropolitan Water District
(Acre Feet)

M.W.D. Member Agencies	Fiscal Year 1987-1988			Fiscal Year 1988-1989			Total Water Use (5)+(6)	Percent Difference of Totals (8)/(4)	Difference of M.W.D. Supply (9)-(3)	Percent Difference of M.W.D. Supply (10)/(3)				
	(1)	(2)	(3)	(4)	(5)	(6)					(7)	(8)	(9)	(10)
	Local Water Supply	M.W.D. Water Supply	Total Water Use (2)+(3)	Local Water Supply	M.W.D. Water Supply	Total Water Use (5)+(6)					Difference in Totals (7)-(4)	Difference of M.W.D. Supply (8)-(3)	Percent Difference of M.W.D. Supply (10)/(3)	
Anaheim	43,839	25,212	69,051	47,777	25,802	73,579	(4,528)	(6.56)	590	2.34				
Beverly Hills	0	14,506	14,506	0	14,594	14,594	88	0.61	88	0.61				
Burbank	802	22,872	23,674	921	22,775	23,696	22	0.09	(97)	(0.42)				
Calleguas M.W.D.	26,549	96,325	122,874	27,481	104,153	131,634	8,760	7.13	7,828	8.13				
Central Basin M.W.D.	127,862	134,901	262,763	124,604	141,019	265,623	2,860	1.09	6,118	4.54				
Chino Basin M.W.D.	156,049	35,575	191,624	160,025	46,354	206,379	14,755	7.70	10,779	30.30				
Coastal M.W.D.	5,907	42,561	48,468	9,552	41,803	51,355	4,887	10.08	1,242	2.92				
Compton	6,690	3,942	10,632	7,243	5,153	12,396	1,764	16.59	1,211	30.72				
Eastern M.W.D.	92,863	35,877	128,740	95,594	48,490	144,084	15,344	11.92	12,613	31.16				
Foothill M.W.D.	6,284	10,461	16,745	5,958	10,891	16,849	104	0.62	430	4.11				
Fullerton	17,310	16,363	33,673	18,529	16,213	34,742	1,069	3.17	(130)	(0.92)				
Glendale	4,274	26,812	31,086	4,104	27,555	31,659	573	1.84	743	2.77				
Las Virgenes	1,209	19,565	20,774	1,021	22,033	23,054	2,280	10.98	2,468	12.61				
Long Beach	29,975	48,782	78,757	30,244	47,298	77,542	(1,215)	(1.54)	(1,484)	(3.04)				
Los Angeles	538,792	148,261	687,053	465,538	230,148	695,686	8,633	1.26	81,887	55.23				
M.W.D. of Orange County	155,709	274,954	430,663	178,405	244,095	422,500	(8,163)	(1.90)	(30,859)	(11.22)				
Pasadena	13,164	25,074	38,238	14,741	23,928	38,669	431	1.13	(1,146)	(4.57)				
San Diego C.W.A.	59,160	525,742	584,902	61,785	592,216	654,001	69,099	11.81	66,474	12.64				
San Fernando	2,136	2,006	4,142	2,206	1,645	3,851	(291)	(7.03)	(361)	(18.00)				
San Marino	5,065	599	5,664	5,394	333	5,727	63	1.11	(266)	(4.41)				
Santa Ana	31,896	15,832	47,728	34,753	15,816	50,569	841	1.69	(16)	(0.10)				
Santa Monica	7,128	11,015	18,143	7,777	9,883	17,660	(483)	(2.66)	(1,132)	(10.28)				
Three Valleys M.W.D.	57,206	66,000	123,206	54,799	68,065	122,864	(342)	(0.28)	2,065	3.13				
Torrance	8,843	20,134	28,977	7,641	22,804	30,445	1,468	5.07	2,670	13.26				
Upper San Gabriel Valley M.W.D.	141,102	50,889	191,991	138,337	55,279	193,616	1,625	0.85	4,390	8.63				
West Basin M.W.D.	2,960	191,936	194,896	6,512	190,685	197,197	2,301	1.18	(1,251)	(0.65)				
Western M.W.D. of Riverside Co.	174,465	35,570	210,035	175,524	77,860	253,384	23,349	10.15	22,290	40.11				
Totals	1,719,239	1,921,766	3,641,005	1,686,465	2,108,890	3,795,355	154,350	4.24	187,134	9.74				



*Views of San Diego - Circa 1887-88
Looking West Across City of San Diego
From 12th and A Streets
San Diego Historical Society - Ticor Collection*

SAN DIEGO COUNTY WATER AUTHORITY
FINANCIAL STATEMENTS
JUNE 30, 1989
with
REPORT OF INDEPENDENT PUBLIC ACCOUNTANTS

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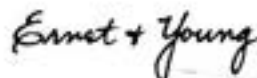
Report of Independent Public Accountants

The Board of Directors
 San Diego County Water Authority

We have audited the balance sheet of the San Diego County Water Authority at June 30, 1989, and the related statements of revenues, expenses and changes in retained earnings, and cash flows for the year then ended. These financial statements are the responsibility of the Authority's management. Our responsibility is to express an opinion on these financial statements based on our audit. The financial statements of the San Diego County Water Authority as of June 30, 1988, were audited by another auditor whose report dated September 2, 1988, expressed an unqualified opinion on those statements.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the 1989 financial statements referred to above present fairly, in all material respects, the financial position of the San Diego County Water Authority at June 30, 1989 and the results of operations and cash flows for the year then ended in conformity with generally accepted accounting principles.



August 25, 1989

SAN DIEGO COUNTY WATER AUTHORITY

BALANCE SHEETS

June 30, 1989 and 1988

ASSETS	<u>1989</u>	<u>1988</u>
Current assets:		
Cash and cash equivalents (Note 2)	\$ 36,146,149	\$ 22,874,903
Accounts and taxes receivable (Note 3)	22,512,585	13,996,171
Inventories (Note 1)	6,659,436	6,290,846
Other current assets	64,532	118,649
Total current assets	<u>65,382,702</u>	<u>43,280,569</u>
Restricted cash and guaranteed investment contract deposits (Notes 2 and 3)	127,308,044	1,331,147
Property, plant and equipment, at cost (Notes 1 and 6)	145,448,309	137,474,520
Deferred compensation deposit (Note 5)	1,222,335	983,978
Other assets (Note 3)	3,155,570	1,208,196
	<u>\$ 342,516,960</u>	<u>\$ 184,278,409</u>
LIABILITIES AND FUND EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	\$ 34,427,717	\$ 25,661,274
Current maturities of long-term debt (Note 3)	12,719,575	6,599,575
Total current liabilities	47,147,292	32,260,849
Long-term debt (Note 3)	165,890,483	38,610,068
Deferred compensation (Note 5)	1,222,335	983,978
Commitments and contingency (Notes 1 and 6)		
Fund equity:		
Contributions in aid of construction (Note 1)	5,057,530	2,140,979
Retained earnings	123,199,320	110,282,545
Total fund equities	<u>128,256,850</u>	<u>112,423,524</u>
	<u>\$ 342,516,960</u>	<u>\$ 184,278,409</u>

See accompanying notes.

SAN DIEGO COUNTY WATER AUTHORITY
STATEMENTS OF REVENUES, EXPENSES AND CHANGES
IN RETAINED EARNINGS

Years ended June 30, 1989 and 1988

	<u>1989</u>	<u>1988</u>
Water and other sales	\$ 127,019,817	\$ 109,837,499
Operating expenses:		
Cost of sales	113,803,502	102,398,696
Plant maintenance	1,275,982	873,481
Depreciation	1,949,410	1,930,891
General and administrative	4,586,770	2,404,658
Total operating expenses	<u>121,615,664</u>	<u>107,607,726</u>
Operating income	5,404,153	2,229,773
Nonoperating revenues (expenses):		
Property taxes and in-lieu fees (Note 1)	7,116,183	6,340,573
Interest expense (Note 1)	(3,057,191)	(2,719,759)
Interest income	2,844,402	2,181,074
Other income	609,228	-
Total nonoperating revenues	<u>7,512,622</u>	<u>5,801,888</u>
Net income	12,916,775	8,031,661
Retained earnings at beginning of year	110,282,545	102,250,884
Retained earnings at end of year	<u>\$ 123,199,320</u>	<u>\$ 110,282,545</u>

See accompanying notes.

SAN DIEGO COUNTY WATER AUTHORITY
STATEMENTS OF CASH FLOWS

Years ended June 30, 1989 and 1988

	<u>1989</u>	<u>1988</u>
Net cash flows provided by operating activities:		
Net income	\$ 12,916,775	\$ 8,031,661
Adjustments to reconcile net income to net cash provided by operating activities:		
Gain on sale of building	(609,228)	-
Depreciation and amortization	1,949,410	1,930,891
Increase in accounts and taxes receivable	(8,516,414)	(112,171)
(Increase) decrease in inventories	(368,590)	665,154
Decrease in other current assets	54,117	686,351
Increase (decrease) in accounts payable and accrued liabilities	8,766,443	(699,842)
Net cash provided by operating activities	14,192,513	10,502,044
Cash flows (used for) provided by investment activities:		
Proceeds from sale of building	688,411	-
Purchase of property, plant and equipment	(10,002,382)	(5,926,411)
(Additions to) deletions from restricted cash and guaranteed investment contract deposits	(125,976,897)	9,268,853
Net cash (used for) provided by investing activities	(135,290,868)	3,342,442
Cash flows provided by (used for) financing activities:		
Contributions in aid of construction	2,916,551	126,979
Proceeds from issuance of debt	140,000,000	-
Repayment of debt	(6,599,575)	(97,999,367)
(Additions to) deletions from other assets	(1,947,375)	927,805
Net cash provided by (used for) financing activities	134,369,601	(96,944,583)
Increase (decrease) in cash and cash equivalents	13,271,246	(83,100,097)
Cash and cash equivalents at beginning of period	22,874,903	105,975,000
Cash and cash equivalents at end of year	<u>\$ 36,146,149</u>	<u>\$ 22,874,903</u>
Supplemental cash flow information:		
Cash paid for interest during the year, net of interest capitalized	<u>\$ 2,404,084</u>	<u>\$ 3,094,940</u>

See accompanying notes.

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

1. Summary of significant accounting policies

Organization - The San Diego County Water Authority (the Authority) was organized on June 9, 1944 under the County Water Authority Act (the Act) for the primary purpose of providing a supplemental supply of imported water to its member agencies for domestic, municipal and agricultural uses. The Authority consists of 24 member agencies which are each represented by at least one person on the Authority's Board of Directors. The Authority is a member of the Metropolitan Water District of Southern California (MWD), and historically, the Authority has purchased from MWD all the water it has needed to meet the demands of the member agencies.

Basis of accounting - The Authority is accounted for as an enterprise fund (proprietary fund type). A fund is an accounting entity with a self-balancing set of accounts established to record the financial position and results of operations of a specific governmental activity. The activities of enterprise funds closely resemble those of ongoing businesses in which the purpose is to conserve and add to basic resources while meeting operating expenses from current revenues.

Enterprise funds account for operations that provide services on a continuous basis and are substantially financed by revenues derived from user charges. As an enterprise fund, the Authority uses the accrual basis of accounting, revenues are recognized when earned and expenses are recognized as they are incurred.

Property taxes and in-lieu fees - The Authority is authorized under the Act to levy taxes on all taxable property within its boundaries for the purpose of carrying on its operations and paying its obligations, subject to certain limitations in the Act, the Revenue and Taxation Code and the California Constitution. The Authority levies taxes to meet its debt service requirements on its general obligation bonds and its obligation under the contract with the U. S. Government (Note 3).

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

1. Summary of significant accounting policies (Cont'd.)

Member agencies of the Authority may elect to pay in-lieu fees instead of the tax levy. Included in property taxes and in-lieu fees for the years ended June 30, 1989 and 1988 are in-lieu fees of approximately \$2,711,000 and \$2,470,000, respectively.

Inventories - Inventories consist primarily of water in storage and are stated at the lower of cost (first-in, first-out) or market.

Property, plant and equipment - Property, plant and equipment is stated at cost. Depreciation is computed utilizing the straight-line method over the following estimated useful lives:

Water system	100 years
Buildings	40 years
Automobiles	5 years
Other equipment	1 to 4 years

Property, plant and equipment consists of the following:

	June 30,	
	1989	1988
Water systems	\$ 154,531,857	\$ 153,948,766
Buildings	4,456,598	810,368
Automobiles and equipment	2,208,357	1,790,272
Construction in progress	13,609,613	8,440,108
	174,806,425	164,989,514
Less accumulated depreciation	29,358,116	27,514,994
	\$ 145,448,309	\$ 137,474,520

Included in construction in progress at June 30, 1989 is approximately \$4,155,000 related to the construction of the Pamo Reservoir Project. The Authority has suspended operations on the Project pending completion of a county-wide water storage plan (the Plan). In the opinion of management, the ultimate resolution of the Plan is not expected to have a material effect on the financial position or results of operations of the Authority.

SAN DIEGO COUNTY WATER AUTHORITY
 NOTES TO FINANCIAL STATEMENTS

June 30, 1989

1. Summary of significant accounting policies (Cont'd.)

Contributions in aid of construction - Amounts received from member agencies for construction of service connections or other facilities are included in the accompanying balance sheets as contributions in aid of construction.

Capitalized interest - The Authority capitalizes interest on self-constructed assets based on a weighted average interest rate on obligations outstanding during the period of construction. Interest earned on interest-bearing investments acquired with proceeds of the related tax-exempt borrowings is offset against the interest cost in determining the maximum interest capitalizable. Interest capitalized during the years ended June 30, 1989 and 1988 was \$174,000 and \$647,000, respectively.

Budgets and budgetary accounting - Annual budgets adopted by the Board of Directors provide for operations, debt service and capital expenditures of the Authority. Budgetary controls are set by the Board of Directors. The budgetary basis of accounting is consistent with generally accepted accounting principles applicable to the Authority's financial statements.

The Board of Directors adopts an operating budget at the beginning of the Authority's fiscal year. The legally adopted budget requires only that expenditures not exceed appropriations in total for the Authority. The Board of Directors may make appropriation adjustments to the budget during the year as deemed necessary.

The Authority adhered to the prescribed budget as discussed above for the years ended June 30, 1989 and 1988.

Reclassification - Certain reclassifications have been made to the June 30, 1988 balances to conform with the 1989 presentation.

2. Cash and cash equivalents and restricted cash and guaranteed investment contract deposits

Cash and cash equivalents consists of highly liquid investments with insignificant risks of changes in value because of changes in interest rates.

SAN DIEGO COUNTY WATER AUTHORITY
 NOTES TO FINANCIAL STATEMENTS

June 30, 1989

2. Cash and cash equivalents and restricted cash and guaranteed investment contract deposits (Cont'd.)

All cash and cash equivalents and restricted cash and guaranteed investment contract deposits are fully insured or collateralized. The California Government Code requires California banks and savings and loan associations to secure the Authority's deposits by pledging government securities as collateral. The market value of pledged securities must equal at least 110% of the Authority's deposits.

The Authority may waive collateral requirements for deposits which are fully insured up to \$100,000 by the Federal Deposit Insurance Corporation (FDIC) or Federal Savings and Loan Insurance Corporation (FSLIC).

The surplus funds of the Authority may be invested in any of the following approved investments: treasury bills and/or treasury notes; commercial bank collateralized public fund deposits; savings and loan collateralized public fund deposits; guaranteed investment contract deposits collateralized by government securities; and money market funds collateralized by government securities.

Cash and cash equivalents and restricted cash and guaranteed investment contract deposits consist of the following:

	June 30,	
	1989	1988
Cash and cash equivalents:		
Certificates of deposits	\$ 28,311,031	\$ 22,768,000
U.S. government securities	7,775,278	75,227
Insured demand deposits	59,840	31,676
	<u>\$ 36,146,149</u>	<u>\$ 22,874,903</u>
Restricted cash and guaranteed investment contract deposits:		
Guaranteed investment contract deposits	\$ 125,976,897	\$ -
U.S. government securities	1,331,147	1,331,147
	<u>\$ 127,308,044</u>	<u>\$ 1,331,147</u>

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

3. Long-term debt

Long-term debt consists of the following:

	June 30,	
	1989	1988
Certificates of participation and general obligation bonds	\$ 166,985,000	\$ 29,715,000
U. S. Government contract	2,125,058	2,494,633
Adjustable convertible extendable securities (ACES)	7,500,000	8,000,000
Other	2,000,000	5,000,000
Total long-term debt	178,610,058	45,209,633
Less amounts due within one year	(12,719,575)	(6,599,575)
	\$ 165,890,483	\$ 38,610,058

Water revenue certificates of participation - To provide funds for the acquisition and construction of water system improvements and the advance refunding of the ACES securities, the Authority issued certificates of participation in May 1989 in the aggregate principal amount of \$140,000,000 with interest, at rates ranging from 6.65% to 7.30% payable semi-annually on May 1 and November 1. The certificates mature serially between May 1, 1993 and May 1, 2009, and may be redeemed at premiums decreasing from 2% in 1997 to 1% in 1999 (thereafter at par).

The certificates require that a reserve be maintained in an amount equal to the lesser of \$14,000,000, 100% of the maximum annual payments or 125% of the average annual payments. Included in restricted cash and guaranteed investment contract deposits is \$14,000,000 which represents the required reserve at June 30, 1989 and \$111,976,897 of unexpended proceeds of the certificates.

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

3. Long-term debt (Cont'd.)

1957 waterworks general obligation bonds - To provide funds for the construction of a second aqueduct and related works, the Authority issued general obligation bonds in the aggregate principal amount of \$35,000,000 with interest rates ranging from 1% to 6% payable semi-annually on February 1 and August 1. The bonds mature serially between February 1, 1959 and February 1, 1994. Included in certificates of participation and general obligation bonds at June 30, 1989 and 1988 is \$8,525,000 and \$10,405,000, respectively.

1966 waterworks general obligation bonds - During 1968 the Authority issued general obligation bonds in the aggregate principal amount of \$30,000,000 with interest rates ranging from 4.5% to 5.5% payable semi-annually on April 1, and October 1, for the construction of a second pipeline to the second aqueduct. The bonds mature serially between October 1, 1969 and October 1, 2003 and may be redeemed on or after October 1, 1980 at premiums decreasing from 3.5% in 1980 to .5% in 2002. Included in certificates of participation and general obligation bonds at June 30, 1989 and 1988 is \$18,460,000 and \$19,310,000, respectively.

U.S. Government contract - The U.S. Government constructed an aqueduct for which the title was conveyed to the Authority upon its completion. The Authority is reimbursing the U.S. Government for the cost of the aqueduct in quarterly principal installments of \$92,394 plus interest at 2.6% annually.

The Authority has entered into an agreement with MWD whereby a portion of the contract will be paid by MWD. Included in accounts and taxes receivable and other assets are the current and long-term portions of this receivable of \$197,000 and \$937,000 respectively, at June 30, 1989 and \$197,000 and \$1,135,000, respectively, at June 30, 1988.

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

3. Long-term debt (Cont'd.)

Adjustable convertible extendable securities (ACES) - The Authority issued the ACES securities for the construction of the Pamo Reservoir Project. Because the Authority suspended the project (Note 1), the ACES securities were refunded in July 1989. Included in restricted cash and guaranteed investment contract deposits at June 30, 1989 and 1988 is a required reserve of \$1,331,000 related to the ACES.

Certain outstanding debt agreements, which were complied with, require the Authority to maintain a minimum level of operational earnings. Exclusive of the tax revenue and debt servicing costs associated with voter-approved general obligation bonds and other voter-approved debt, net revenue, as defined by the agreements, must equal or exceed 120% of all other debt servicing costs (principal and interest).

Included in other assets are deferred financing costs of approximately \$2,218,000 and \$73,000, net of accumulated amortization, at June 30, 1989 and 1988, respectively. The deferred financing costs are being amortized using the straight-line method over the life of the related obligation.

The aggregate principal payments on long-term debt beginning in fiscal year 1990 are summarized as follows:

1990	\$ 12,719,575
1991	3,334,575
1992	3,439,575
1993	8,119,575
1994 and thereafter	150,996,758
	<u>\$178,610,058</u>

4. Retirement plan

Public Employees Retirement System plan description - The Authority is a member of the California Public Employees' Retirement System (PERS), an agent multiple-employer pension system that acts as a common investment

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

4. Retirement plan (Cont'd.)

and administrative agent for participating public entities within the State. The Authority's total covered payroll for employees participating in PERS for the fiscal year ended June 30, 1989 is \$2,646,754. The Authority's total payroll is \$2,717,809.

All permanent employees of the Authority are eligible to participate in PERS upon entry into employment. Retirement benefits vest after five years of service and PERS also provides death and disability benefits. Retirement benefits are based on average salary and years of credited service.

Employee and employer contributions - Both the Authority and the employees are required to contribute to PERS. The Authority pays its share and the entire portion of the employees' share. The employee rate of 7% is set by statute and therefore, generally remains unchanged from year to year. The Authority is required to contribute the remaining amounts necessary to fund the benefits for its members, using the actuarial basis recommended by PERS actuaries and actuarial consultants and adopted by the PERS Board of Administration.

Funding status and progress - The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases and step-rate benefits, estimated to be payable in the future as a result of employee service to date. The measure is intended to help users assess the funding status of PERS on a going concern basis, assess the progress made in accumulating sufficient assets to pay benefits when due, and make comparisons among employers. The measure is the actuarial present value of credited projected benefits and is independent of the funding method used to determine contributions to PERS.

The pension benefit obligation was computed as part of an actuarial valuation performed as of June 30, 1988. Significant actuarial assumptions used in the valuation include the following: (a) a rate of return on the investment of

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

4. Retirement plan (Cont'd.)

present and future assets of 8.5% a year, compounded annually; (b) projected salary increases attributable to inflation of 5% per year compounded annually; (c) additional projected salary increases of 2% per year, attributable to seniority/merit; and (d) no post retirement benefit increases.

The total unfunded pension benefit obligation applicable to the Authority's employees was \$956,236 at June 30, 1988 as follows:

Pension benefit obligation:	
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$2,208,917
Current employees:	
Accumulated employee contributions including allocated investment earnings	1,473,797
Employer-financed vested	2,708,806
Employer-financed nonvested	91,668
Total pension benefit obligation	6,483,188
Net assets available for benefits at cost (market value is \$6,250,983)	5,526,952
Unfunded pension obligation	<u>\$ 956,236</u>

There were no changes in actuarial assumptions or benefit provisions in the current year.

Actuarially determined contribution requirements and contributions made - PERS uses the entry-age normal actuarial cost method. As a projected benefit cost method, it takes into account those benefits that are expected to be earned in the future as well as those already accrued. The normal cost for an employee is the level amount which would fund the projected benefit if it were paid annually from the date of employment until retirement. PERS uses a modification of the entry-age method in which the Authority's total normal cost is expressed as a level percentage of payroll. PERS uses this same method to amortize any unfunded actuarial liabilities. The amortization period of the unfunded liability ends in the year 2000.

SAN DIEGO COUNTY WATER AUTHORITY
NOTES TO FINANCIAL STATEMENTS

June 30, 1989

4. Retirement plan (Cont'd.)

The significant actuarial assumptions used to compute the actuarially determined contribution requirement are the same as those used to compute the pension benefit obligation, as previously described.

The contribution to PERS for 1989 of \$512,464 was made in accordance with actuarially determined requirements computed through an actuarial valuation performed as of June 30, 1987. The contribution consisted of \$381,900 normal costs (14.43% of current covered payroll) and \$130,564 amortization of the unfunded actuarial accrued liability (4.93% of current covered payroll).

Trend information - Trend information gives an indication of the progress made in accumulating assets to pay benefits when due. Ten year trend information may be found in the California Public Employees Retirement System Annual Reports.

Trend information for the Authority is only available for the years ended June 30, 1989 and 1988 and is summarized as follows:

	June 30,	
	1989	1988
Net assets available for benefits, expressed as a percentage of the pension benefit obligation	85.3%	80.3%
Unfunded pension obligation, expressed as a percentage of annual covered payroll	36.1%	66.0%
Employer contributions expressed as a percentage of annual covered payroll	19.4%	19.0%

5. Deferred compensation plan

The Authority has adopted and administers a deferred compensation plan in accordance with Section 457 of the Internal Revenue Code. Generally, all eligible employees may defer receipt of a portion of their salary until future years. Once deferred, the compensation is not available to the employees until

SAN DIEGO COUNTY WATER AUTHORITY

NOTES TO FINANCIAL STATEMENTS

June 30, 1989

5. Deferred compensation plan (Cont'd.)

termination, retirement, death or unforeseeable emergency. The employees are not liable for income taxes on amounts deferred until the funds are withdrawn. At June 30, 1989 and 1988, assets of the plan totaled \$1,222,335 and \$983,978, respectively.

All compensation deferred under the plan, all assets purchased with the deferred amounts and all income attributable to these amounts or assets (until paid or made available to the employee or other beneficiary) are the sole property of the Authority, subject to the claims of the Authority's general creditors. Participants' rights to deferred amounts under the plan are equal to those of the general creditors of the Authority.

6. Commitments

The Authority is committed to a long-range effort to increase the present aqueduct capacity, obtain additional water from MWD, provide additional storage within the county and maximize the use of existing storage reservoirs. The Authority estimates that the cost of the capital improvement program will be approximately \$530 million and will be expended over the next eight years. The Authority expects to fund approximately 60 percent of these requirements through the sale of bonds or other debt obligations. The remaining portion will be funded from future earnings.