



MANAGEMENT OF THE
CALIFORNIA
STATE WATER
PROJECT

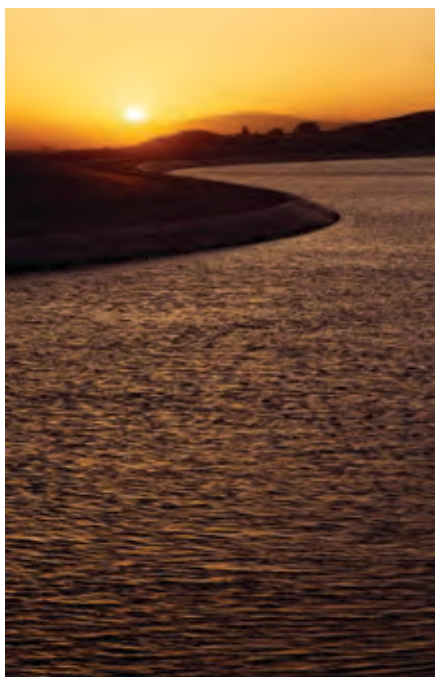
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JOHN LAIRD
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Management of the California State Water Project

Covers Calendar Year 2011 Activities



50th Edition
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John Laird *Secretary for Natural Resources*
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Foreword

*B*ulletin 132-12, Management of the California State Water Project, continues the Bulletin 132 annual series begun in 1963. Bulletin 132-12 reports water supply planning, construction, financing, management, and operation activities of the State Water Project (SWP). Appendix B contains data and computations used to determine the SWP water contractors' Statements of Charges for 2013. Appendix B was previously printed and distributed to SWP water contractors to document and support calculation of contractors' annual charges.

The Bulletin discusses significant events and issues that affect SWP management and operations. The Bulletin covers the period from January 1, 2011, through December 31, 2011.

Bulletin 132-12 also discusses water supply and delivery as well as Delta resources and environmental issues, local assistance programs, power resources, recreation, and financial analysis of the State Water Project.

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than were available at the time of publication, please consult the most recent edition of Bulletin 132 or contact DWR staff in the State Water Project Analysis Office.



Mark W. Cowin
Director

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Appendix D	Costs of Recreation and Fish and Wildlife Enhancement (discontinued)
Appendix E	Water Operations in the Sacramento-San Joaquin Delta (discontinued)
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California Water Commission

The California Water Commission consists of nine members appointed by the Governor and confirmed by the Senate. Seven members are chosen for their expertise related to the control, storage, and beneficial use of water, and two are chosen for their knowledge of the environment. The commission advises the Director of the Department of Water Resources (DWR) on matters within DWR's jurisdiction, approves rules and regulations, and monitors and reports on the construction and operation of the State Water Project (SWP).

The roles and responsibilities of the California Water Commission are defined in the Water Code, Government Code, and Code of Civil Procedure.

The commission's SWP-specific responsibilities are to:

- conduct an annual review of the construction and operation of the SWP and report to DWR and the Legislature with any recommendations (Water Code Section 165);
- hold public hearings on all additional facilities proposed to be added to the SWP and name any new facilities (Water Code Sections 161.5 and 166); and
- adopt a resolution of necessity, and give each affected person a venue to be heard, before DWR may commence an eminent domain proceeding (Code of Civil Procedure Section 1245.210).

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Acronyms and Abbreviations

Symbols

µg/L micrograms per liter
µS/cm microsiemens per centimeter

A

AB Assembly Bill
af acre-feet/acre-foot
ANS Aquatic Nuisance Species
ASC Agricultural Stakeholder Committee
AWMP Agricultural Water Management Plan

B

Bay-Delta San Francisco Bay/Sacramento-San Joaquin Delta
Bay-Delta Estuary San Francisco Bay/Sacramento-San Joaquin Delta Estuary
BDCP Bay Delta Conservation Plan
BO biological opinion

C

CAISO California Independent System Operator
CALFED CALFED Bay-Delta Program
California State Parks California Department of Parks and Recreation
Caltrans Department of Transportation
CAMAL Net California Association of Mutual Aid Laboratories Network
C.A.S.T. Catch A Special Thrill
CCR California Code of Regulations
CDPH California Department of Public Health
CEQA California Environmental Quality Act
CESA California Endangered Species Act
cfs cubic feet per second
CIMIS California Irrigation Management Information System
CVC Cross Valley Canal
CVP Central Valley Project
CWC California Water Code
CWT coded wire tagged

D

D-1641 State Water Resources Control Board, Water Right Decision 1641
DDA Davis-Dolwig Act

DFW Department of Fish and Wildlife
DHCCP Delta Habitat Conservation and Conveyance Program
DO dissolved oxygen
DOC dissolved organic carbon
DOE Division of Engineering
DRMS Delta Risk Management Strategy
DSC Delta Stewardship Council
DSM2 Delta Simulation Model 2
DSOD Division of Safety of Dams
DWR Department of Water Resources
DWSC Deep Water Ship Channel

E

EC electrical conductivity
EIR environmental impact report
EIS environmental impact statement
EPA U.S. Environmental Protection Agency
ESA federal Endangered Species Act

F

FERC Federal Energy Regulatory Commission
FRFH Feather River Fish Hatchery
FRP Fish Restoration Program

G

GHG greenhouse gas
gpm gallons per minute

H

HEA Habitat Expansion Agreement
Hyatt-Thermalito Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant

I

IEP Interagency Ecological Program
IFDM Integrated On-Farm Drainage Management
IR Interim Renewal
IRWM Integrated Regional Water Management
ITP incidental take permit

K

kV kilovolt
kWh kilowatt hour

L

LA County Parks Los Angeles County Department of Parks and Recreation
LADWP Los Angeles Department of Water and Power
LTMS Long-Term Management Strategy

M

maf million acre-feet
mg/L milligrams per liter
MIDS Morrow Island Distribution System
MRTU Market Redesign and Technology Upgrade
mS/cm millisiemens per centimeter
MW megawatt
MWh megawatt hour
MWQI Municipal Water Quality Investigations
MWQP Municipal Water Quality Program
MWT McCormack-Williamson Tract

N

NBA North Bay Aqueduct
NDFCERP North Delta Flood Control and Ecosystem Restoration Project
NDOI Net Delta Outflow Index
NEPA National Environmental Policy Act
NERC North American Electric Reliability Corporation
NOAA Fisheries National Marine Fisheries Service
NVE NV Energy

O

O&M Division of Operations and Maintenance
OMP&R operations, maintenance, power, and replacement
OM&R operations, maintenance, and replacement

P

PAO Public Affairs Office
PG&E Pacific Gas & Electric Company
PIT passive integrated transponder
POD pelagic organism decline

Q

QA quality assurance
QC quality control
QSA Quantification Settlement Agreement

R

Reclamation Bureau of Reclamation
RETI Renewable Energy Transmission Initiative
R&FWE Recreation and Fish and Wildlife Enhancement
RIMPR Renewable Integration Market and Product Review
RM river mile
RPA reasonable and prudent alternative
RRR Red Rock Ranch
RRSDS Roaring River Slough Distribution System
RST rotary screw trap
RTDF-CP Real Time Data and Forecasting Comprehensive Program
RWQCB Regional Water Quality Control Board

S

Sacramento Valley 40-30-30 Index Sacramento Valley water year hydrologic classification
San Joaquin Valley 60-20-20 Index San Joaquin Valley water year hydrologic classification
SARMP Settlement Agreement Recreation Management Plan
SB Senate Bill
SBA South Bay Aqueduct
SBX7 7 Water Conservation Act of 2009
SCE Southern California Edison
SDIP South Delta Improvements Program
SJRRP San Joaquin River Restoration Program
SMP Suisun Marsh Habitat Management, Preservation, and Restoration Plan
(Suisun Marsh Plan)
SMPA Suisun Marsh Preservation Agreement
SMSCG Suisun Marsh Salinity Control Gates
SRCD Suisun Resource Conservation District
SWAT Soil Water Assessment Tool
SWG Smelt Working Group
SWP State Water Project
SWPAO State Water Project Analysis Office
SWRCB State Water Resources Control Board

U

UC University of California
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey

V

VAMP Vernalis Adaptive Management Plan

W

WCD water conservation district
WD water district
WQCP water quality control plan

Y

Yuba Accord Lower Yuba River Accord

SWP Long-term Water Contractors

The State Water Project long-term water supply contractors are listed below, followed by shortened forms of their names that are used in Bulletin 132.

Alameda County Flood Control and Water Conservation District, Zone 7	Alameda-Zone 7
Alameda County Water District	Alameda County
Antelope Valley-East Kern Water Agency	AVEK
Castaic Lake Water Agency	Castaic Lake
City of Yuba City	Yuba City
Coachella Valley Water District	Coachella
County of Butte	Butte
County of Kings	Kings
Crestline-Lake Arrowhead Water Agency	Crestline
Desert Water Agency	Desert
Dudley Ridge Water District	Dudley Ridge
Empire West Side Irrigation District	Empire
Kern County Water Agency	Kern
Little Rock Creek Irrigation District	Little Rock
The Metropolitan Water District of Southern California	Metropolitan
Mojave Water Agency	Mojave
Napa County Flood Control and Water Conservation District	Napa
Oak Flat Water District	Oak Flat
Palmdale Water District	Palmdale
Plumas County Flood Control and Water Conservation District	Plumas
San Bernardino Valley Municipal Water District	San Bernardino
San Gabriel Valley Municipal Water District	San Gabriel
San Geronio Pass Water Agency	San Geronio
San Luis Obispo County Flood Control and Water Conservation District	San Luis Obispo
Santa Barbara County Flood Control and Water Conservation District	Santa Barbara
Santa Clara Valley Water District	Santa Clara
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura



State Water Project Highlights

Sunset over the California Aqueduct.



The annual Bulletin 132 series began in 1963 and reported the first deliveries of water by the new State Water Project (SWP). Bulletin 132-12, *Management of the California State Water Project*, continues this series as the fiftieth edition. It reports on SWP planning, construction, finance, management, and operations during calendar year 2011. The SWP is operated and maintained by the California Department of Water Resources (DWR).

The SWP is one of the world's largest water, power, and conveyance systems. In the past decade it has conveyed an annual average of 2.9 million acre-feet (maf) of water. SWP facilities—pumping and power plants; reservoirs, lakes, and storage tanks; canals, tunnels, and pipelines—capture, store, and convey water to public water agencies and local water districts.

50th Edition of Bulletin 132

Bulletin 132-12 marks the 50th edition of the Bulletin 132 annual publication. The first edition of this comprehensive series was published in April 1963, entitled *The California State Water Project in 1963*, when Edmund G. "Pat" Brown was governor.

Former DWR Director Ronald B. Robie Honored

On September 21, 2011, California Water Commission members unanimously approved the renaming of SWP's Thermalito Pumping-Generating Plant in honor of former DWR Director Ronald B. Robie. The facility's new name is the Ronald B. Robie Thermalito Powerplant.

Drought

On March 30, 2011, the Governor proclaimed an end to the State's drought. The Governor's Proclamation officially rescinded Executive Order S-06-08 and ended the States of Emergency called in June 2008 and February 2009 relating to water shortage associated with the drought.

For more information, see Chapter 3, Environmental Programs.

Yearly Activities Summary

2011 Precipitation and Water Storage

Water stored and delivered by the SWP conservation and transportation facilities originates from rainfall and snowmelt in Northern and Central California watersheds, where most of the State's precipitation occurs. DWR monitors and records annual precipitation and runoff during each water year, which begins on October 1 and ends on September 30.

Precipitation and Snowpack in Water Year 2010–2011

California experienced above-average rainfall and mountain snowpack during water year 2010–2011. The state received precipitation at 135 percent of average in 2010–2011, compared to 108 percent of average in 2009–2010. The Northern Sierra 8-Station Precipitation Index finished the water year with 72.7 inches of precipitation (145 percent of average). The statewide average snow water equivalent, based on snow sensors, reported for April 1 was 47.7 inches, or 165 percent of average.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San

Joaquin Valley 60-20-20 Index) were both considered “wet,” based on all observed data for water year 2010–2011.

Runoff

Statewide unimpaired runoff totaled 146 percent of average in the 2010–2011 water year. Runoff in the Sacramento River and San Joaquin River regions was 135 and 184 percent of average, respectively.

Water Year 2010–2011 Storage Totals

At the end of the 2010–2011 water year, water storage in major SWP reservoirs and the State’s share of joint-use reservoirs was 4.64 maf or 85 percent of maximum storage, compared to 2.81 maf or 52 percent of maximum storage at the end of water year 2009–2010. The average end-of-month total storage for the 2010–2011 water year in major SWP reservoirs was 4.27 maf. End-of-water-year storage on September 30, 2011, at Lake Oroville was 3.04 maf, which was about 1.29 maf more than the previous water year.

Calendar Year 2011 Storage Total

The total storage in major SWP reservoirs was about 4.10 maf at the end of 2011, compared with 3.58 maf in 2010. The State’s share of San Luis Reservoir storage was 964,240 acre-feet (af) on December 31, 2011, compared with 802,515 af at the same time in 2010. The combined storage in the southern reservoirs was 586,234 af on December 31, 2011, compared with 601,004 af at the same time in 2010.

Diversions from the Delta

In 2011, the SWP diverted 3,879,762 af at Banks Pumping Plant. There was no Cross Valley Canal water or Central Valley Project water wheeled at Banks Pumping Plant by DWR during 2011.

Maximum daily Delta exports occurred on January 8, 2011, at 25,129 af. Combined

SWP and CVP monthly Delta exports in 2011 varied from a low of 210,509 af in May, to a high of 708,463 af in August. In 2011, Delta exports totaled approximately 6.5 maf.

For more information, see Chapter 8, Water Supply.

2011 Water Supplies, Contracts, and Deliveries

2011 Water Deliveries

DWR approved 1.04 maf on November 22, 2010, resulting in initial Table A amounts of 25 percent of most SWP water contractor requests. DWR increased the 2011 Table A amounts to 3.34 maf, or 80 percent, on April 20, 2011, for the final allocation. For more information on changes in Table A amounts that were approved by DWR, see Chapter 9, Water Contracts and Deliveries.

In 2011, 4,630,798 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 24 other agencies.

The portion delivered to the SWP water contractors was 3,348,931 af, categorized as follows:

- 2,512,484 af of total 2011 Table A water;
- 12,331 af of transferred Table A water;
- 23,383 af of exchanged Table A water;
- 31,061 af of Pool A and Pool B water;
- 420,814 af of Article 21 water;
- 268,313 af of 2010 carryover water (Article 12(e) and Article 56(c));
- 39,549 af recovered from water banks;
- 36,531 af of flexible storage withdrawal;
- 2,872 af of settlement water; and
- 1,593 af of SWP water for recreation and fish and wildlife.

The remaining portion was delivered to 24 non-SWP agencies and

totaled 1,281,867 af, which was categorized accordingly:

- 1,064,507 af of local water;
- 1,141 af of permit water; and
- 216,219 af delivered to satisfy agreements between the SWP and CVP.

Table H-1 shows SWP water deliveries by category for 1962 through 2011.

For more information, see Chapter 9, Water Contracts and Deliveries.

Power Resources

In 2011, DWR sold 1.19 million megawatt hours of energy to one utility and seven WSP power marketers for a total revenue of \$43.72 million. DWR also received \$84.00 million in revenues for capacity and other energy-related services, including \$81.47 million for transactions made through the California Independent System Operator.

The sidebar, State Water Project Power Generation and Consumption in 2011, summarizes amounts of power generated and consumed by the SWP. For detailed information, see Chapter 10, Power Resources.

Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with the Federal Energy Regulatory Commission (FERC) requesting a new license for the Oroville Facilities (FERC Project No. 2100). The existing 50-year hydropower license expired January 31, 2007, and, until a new license is issued, FERC is issuing annual licenses. The new hydropower license is currently expected sometime in 2014 or later. A partial list of SWP facilities that will be subject to the new license terms and conditions is available in Chapter 10, Power Resources.

A number of significant events associated with Oroville Facilities relicensing occurred in 2011. For details, see Chapter 3, Environmental Programs; Chapter 6, Legislation and Litigation; Chapter 10, Power Resources; and Chapter 13, Recreation.

Financial Analysis

In 2011, DWR continued to pay bondholders as scheduled. The SWP was financially viable and was indirectly paid for by the approximately 25 million water users served by the project. Direct payment was through the 29 long-term water contractors. In 2011, the SWP handled approximately \$1.04 billion in revenues and \$1.04 billion in expenses. The 2011 Income Statement for the State Water Project sidebar presents a summary of the year's revenues and expenses. For detailed information, see Chapter 14, Financial Analysis.

Engineering, Construction, and Real Estate

In 2011, engineering, construction, and real estate work to enhance, expand, repair, and protect the SWP and other facilities within the State continued. Significant projects included the South Bay Aqueduct enlargement, South Bay Pumping Plant expansion, Edmonston Pumping Plant refurbishment, Hyatt Powerplant pump-turbine refurbishment, and East Branch Extension Phase I improvements and Phase II projects.

DWR worked on 61 construction contracts in 2011. Projects included turbine and pump replacement, pipeline repair, trash rack upgrade at fish hatcheries, and recreational and maintenance facilities improvements at dam and reservoir sites.

DWR processed a net total of \$3.8 million in payments in 2011 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. DWR also conducted real estate

Table H-1 SWP Water Delivered by Category, 1962–2011 (acre-feet)

Year	Table A Water			Article 21/Unscheduled		Other SWP Water Deliveries			Total Deliveries
	Municipal and Industrial	Agricultural	Total Table A ^a	Municipal and Industrial	Agricultural	Other Water ^b	Feather River Diversions ^c	Fish & Wildlife/ Recreation Water	
1962	—	—	—	—	—	9,704	7,499	—	17,203
1963	—	—	—	—	—	13,212	16,049	—	29,261
1964	—	—	—	—	—	21,743	17,891	—	39,634
1965	—	—	—	—	—	35,985	27,425	—	63,410
1966	—	—	—	—	—	59,599	33,361	—	92,960
1967	5,563	5,791	11,354	0	0	45,225	24,639	—	81,218
1968	86,541	85,168	171,709	10,000	111,534	1,214	903,367	—	1,197,824
1969	63,956	129,064	193,020	0	72,397	8,692	832,454	—	1,106,563
1970	83,415	150,578	233,993	0	131,848	25,401	804,320	—	1,195,562
1971	93,776	263,564	357,340	0	294,581	35,438	825,886	8	1,513,253
1972	186,796	425,005	611,801	0	422,322	53,848	875,529	6,489	1,969,989
1973	297,497	395,391	692,888	0	294,916	29,540	851,285	1,155	1,869,784
1974	423,982	450,093	874,075	0	412,453	31,493	963,956	2,118	2,284,095
1975	670,492	553,498	1,223,990	356	620,329	46,995	924,696	3,377	2,819,743
1976	631,876	741,126	1,373,002	4,147	547,538	103,546	1,018,653	1,745	3,048,631
1977	354,930	218,966	573,896	0	0	410,991	624,497	1,111	1,610,495
1978	782,625	529,740	1,312,365	0	16,215	177,245	836,864	1,691	2,344,380
1979	692,888	711,404	1,404,292	0	646,830	431,693	933,067	1,766	3,417,648
1980	726,545	784,946	1,511,491	52,200	350,017	40,269	925,750	2,131	2,881,858
1981	1,053,273	835,852	1,889,125	18,920	889,508	283,310	993,785	4,688	4,079,336
1982	916,014	822,042	1,738,056	140	214,994	144,267	819,586	4,646	2,921,689
1983	482,749	701,370	1,184,119	0	13,019	172,030	633,778	7,849	2,010,795
1984	725,799	861,794	1,587,593	3,663	259,254	366,273	891,128	7,040	3,114,951
1985	983,341	929,424	1,912,765	9,638	292,206	474,417	924,049	4,033	3,617,108
1986	998,611	1,009,295	2,007,906	2,595	21,755	177,176	843,040	3,865	3,056,337
1987	1,079,983	1,033,932	2,113,915	6,949	107,958	375,810	882,301	7,672	3,494,605
1988	1,308,071	1,068,302	2,376,373	0	0	520,375	884,877	4,889	3,786,514
1989	1,602,543	1,251,204	2,853,747	0	0	474,559	830,500	8,135	4,166,941
1990	1,876,072	706,079	2,582,151	0	90	424,697	875,099	9,262	3,891,299
1991	536,669	12,444	549,113	3,521	0	543,582	565,395	4,879	1,666,490
1992	955,687	455,112	1,410,799	1,156	0	166,992	613,978	2,605	2,195,530
1993	1,069,258	1,243,978	2,313,236	0	0	256,853	822,589	2,609	3,395,287
1994	1,134,992	614,359	1,749,351	48,150	64,475	236,739	874,018	8,200	2,980,933
1995	801,570	1,165,523	1,967,093	17,984	46,346	85,560	860,077	2,575	2,979,635
1996	1,143,638	1,371,186	2,514,824	12,091	16,556	252,346	1,005,148	3,907	3,804,872
1997	1,220,200	1,040,183	2,260,383	2,814	18,618	322,000	993,211	4,146	3,601,172
1998	865,795	860,724	1,726,519	9,982	10,306	127,405	872,738	2,108	2,749,058
1999	1,405,311	1,333,592	2,738,903	61,191	96,879	85,312	1,108,672	4,324	4,095,281
2000	1,968,161	1,231,745	3,199,906	170,302	138,483	333,384	1,085,886	4,030	4,931,991
2001	1,168,333	365,930	1,534,263	10,261	33,174	535,147	1,077,997	2,929	3,193,771
2002	1,849,052	715,805	2,564,857	9,502	27,663	272,277	1,131,880	3,694	4,009,873
2003	2,102,557	787,658	2,890,215	5,397	29,629	233,069	1,006,995	2,846	4,168,151
2004	1,951,657	643,342	2,594,999	103,890	112,949	341,922	1,171,835	2,865	4,328,460
2005	1,877,647	948,563	2,826,210	186,787	544,296	92,858	1,074,706	1,506	4,726,363
2006	1,973,268	998,583	2,971,851	293,358	327,981	119,405	1,112,551	1,936	4,827,082
2007	1,572,198	509,019	2,081,217	185,825	124,148	449,935	1,217,990	2,581	4,061,696
2008	1,015,241	218,999	1,234,240	2,729	0	488,818	1,109,563	2,778	2,838,128
2009	883,760	348,860	1,232,620	6,032	0	527,207	1,150,150	2,047	2,918,056
2010	1,427,202	503,727	1,930,929	7,505	0	559,553	1,005,986	1,167	3,505,140
2011	1,871,986	975,586	2,847,572	207,568	213,246	332,277	1,028,542	1,593	4,630,798
Total	44,921,520	31,008,546	75,930,066	1,454,653	7,524,513	11,357,388	40,915,238	148,995	137,330,853

^a Includes Table A, Table A transfers, Table A exchanges, Carryover, and Pool Water.^b Includes water conveyed for SWP and non-SWP water contractors.^c Includes amounts of water diverted according to various water rights agreements.

activities related to SWP acquisitions, temporary permits, property management, and appraisals.

For more information, see Chapter 12, Engineering, Construction, and Real Estate.

Delta Resources and Environmental Issues

Delta Stewardship Council

In November 2011, the draft program environmental impact report for the Delta Stewardship Council's *Delta Plan* was released for public review and comment.

Delta Risk Management Strategy

The Delta Risk Management Strategy Phase 2 identified and analyzed measures to reduce risks to the Delta and the State from the consequences of levee failure. In 2011, the Delta Risk Management Strategy project released the Phase 2 report.

Delta Smelt Abundance

The abundance index for Delta Smelt rose significantly in 2011 to a value nearly 12 times higher than in 2010. This was the highest observed index for Delta Smelt in a decade.

Spring-run Chinook Salmon

In June 2011, DWR increased flows in the upper reaches of the lower Feather River to benefit spring-run Chinook Salmon. Flows were increased June 20–25, from 700 cubic feet per second to 2,600 cubic feet per second, to attract additional spring-run Chinook Salmon to the Feather River Fish Hatchery.

Fish Restoration Program

Pursuant to the Fish Restoration Program Agreement, DWR and the Department of Fish and Wildlife began developing a strategy for implementing restoration actions to satisfy DWR's obligations under the biological

opinions and incidental take permit. A draft was distributed to stakeholders for public review in fall 2011.

Climate Change

In 2011, several climate change studies were initiated or ongoing. For more information, see Chapter 3, Environmental Programs.

The *Climate Change Handbook for Regional Water Planning* was released in December. The handbook provides resources and tools to guide water resource managers and planners as they develop ways to adapt their programs to a changing climate. The handbook was developed cooperatively by DWR, the U.S. Environmental Protection Agency, Resources Legacy Fund, and U.S. Army Corps of Engineers. The handbook is available on DWR's website.

Suisun Marsh

The final environmental impact statement/environmental impact report for the *Suisun Marsh Habitat Management, Preservation, and Restoration Plan* was completed in November 2011.

Recreation

In 2011, SWP facilities supported an estimated 4.1 million recreation days of use, down somewhat from the 4.3 million reported in 2010. In 2011, SWP recreation use was concentrated at the lakes and major reservoirs, with 38 percent occurring in the Oroville Field Division and 43 percent occurring at the four major reservoirs in Southern California. For further recreation information, see Chapter 13, Recreation.

SWP Security Measures

Security and protection of the SWP remain primary goals for DWR. SWP facilities are closely monitored, and DWR staff are vigilant in maintaining a secure environment. Security patrols of SWP facilities are frequent and ongoing, and plans are in place to

State Water Project Power Generation and Consumption in 2011

Power Generation and Consumption	Megawatt Hours
Energy generation by SWP facilities	4,846,000
Energy sources and firm purchases under agreements and exchanges	4,895,000
Total Energy Available to the SWP	9,741,000
Energy sales	(1,192,000)
Net SWP Power Consumption	8,549,000

address potential or actual acts of terrorism. Security system improvements continue in conjunction with the Bureau of Reclamation and other federal and State agencies.

SWP Milestones through the Decades

50 Years Ago—1961

Construction began on SWP facilities, including Oroville Dam, on the Feather River in the upper Sacramento Valley.

The State and federal governments signed an agreement to build the San Luis Joint-Use Facilities for storage, pumping, and conveyance for State and federal water operations.

40 Years Ago—1971

In June, water storage in Lake Oroville reached the maximum design capacity of 3,537,577 af for the first time.

In October, Governor Ronald Reagan started the first pump at Edmonston Pumping Plant as part of a ceremony celebrating the first water deliveries to Southern California.

By the end of 1971, 99.7 percent of the facilities required to fulfill initial water delivery commitments were either completed or under construction.

30 Years Ago—1981

DWR celebrated its 25th anniversary at the Sacramento Convention Center.

In May, the California Water Commission renamed the Delta Pumping Plant in honor of Harvey O. Banks, the first director of DWR.

20 Years Ago—1991

The year 1991 was the driest single year of California's multiyear statewide drought that lasted from 1987 to 1992.

2011 Income Statement for the State Water Project

Revenues	Thousands of Dollars
Water Contract Payments	1,105,849
Revenue Bond Cover Adjustments	(51,933)
Rate Management Adjustments	(27,880)
Other Revenues	18,614
Total Operating Revenues^a	1,044,650
Expenses	
Project Operations, Maintenance, Power, and Replacement	735,374
Deposits to Reserves	1,809
Water Bond Principal	173,424
Water Bond Interest	134,042
Total Operating Expense and Debt Service^a	1,044,650
Net System Revenues	0

^a Totals may not sum due to rounding.

California began its first statewide water transfer program, the Drought Water Bank. Established through Executive Order by the Governor in February 1991, the bank was administered by DWR to facilitate transfers and sales of water during the drought to meet water needs.

The South Delta Temporary Barriers Project was initiated in response to a lawsuit filed in 1982 by the South Delta Water Agency against DWR.

10 Years Ago—2001

The CALFED Bay-Delta Program's Environmental Water Account completed its first year of operation. It provided 287,000 af of water for environmental purposes without reducing SWP deliveries.

Crafton Hills Reservoir was completed in August.



Chapter 1

The State Water Project

California poppy (*Eschscholzia californica*).

*T*his chapter primarily provides background on the State Water Project (SWP), including brief descriptions of SWP facilities, planning, construction, power operations, financing, contracting agencies, and the project's many uses and functions. It also provides a glimpse of California history, with a look at the processes and decisions that went into the creation of the largest state-built water project in the country.

Chapters 2 through 15 provide more detail on significant events and specific topics related to management of the SWP in calendar year 2011. At the end of the bulletin, Appendix B presents data and computations used to determine the SWP Contractors' Statements of Charges for 2013.

Information in this chapter was contributed by the Division of Operations and Maintenance and the State Water Project Analysis Office.

California's diverse geography contains both the highest and lowest elevations in the coterminous United States, with a resulting diversity of climate that ranges from desert to alpine to subtropical. In a typical year, some areas receive as little as 2 inches of rain, while others receive more than 100 inches. This diversity of geography and climate creates an intricate and constantly changing pattern of water supplies, which, in turn, creates enormous challenges in managing this vital resource.

The State Water Project

Like present-day Californians, the earliest settlers faced the problem of how best to conserve, control, and deliver water. Remains of aqueducts, canals, and dams are still found near some of California's original missions. The first recorded aqueduct, built in 1770 to serve the San Diego mission, was 6 miles long. In the early twentieth century, several cities, including San Francisco and Los Angeles, built aqueducts to convey water from the Sierra Nevada to other parts of the State.

In 1951, after many years of discussion and study, the Legislature authorized construction of a water storage and supply system to capture and store rainfall and snowmelt runoff in Northern California and deliver it to areas of need throughout the State. Eight years later, the Legislature passed the Burns-Porter Act, which provided the mechanism for obtaining funds necessary to construct the initial State Water Project (SWP) facilities. In 1960, California voters approved an issue of \$1.75 billion in general obligation bonds, as authorized in the act, thereby securing funds to build the SWP. In 1962, the first water was delivered through a portion of the South Bay Aqueduct to two long-term contracting agencies in Alameda County.

Today the SWP, built, operated, and managed by the Department of Water Resources (DWR), is the largest state-built,

multipurpose, user-financed water project in the country. It was designed and built to deliver water, control flooding, generate power, provide recreational opportunities, and enhance habitat for fish and wildlife. SWP water irrigates about 750,000 acres of farmland, mainly in the southern San Joaquin Valley. Approximately 25 million of California's estimated 37 million residents benefit from SWP water.

Precipitation and Runoff

The water stored and delivered by the SWP originates from rainfall and snowmelt runoff in Northern and Central California's watersheds, where most of the State's precipitation occurs.

Since 1968, DWR has monitored and recorded annual precipitation and runoff, because precipitation, snowpack, and the rate and amount of snowmelt help determine how much water the SWP can deliver in any given year. The DWR-designated water year is October 1 through September 30.

Water Delivery Facilities

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. Although initial water transportation facilities were essentially completed in 1973, other facilities have since been built, and still others are either under construction or are planned to be built, as needed.

The SWP facilities include 30 dams (29 of which impound water), 20 reservoirs, 29 pumping and generating plants, and approximately 700 miles of aqueducts. Figure 1-1 shows the names and locations of primary water delivery facilities.

Existing long-term SWP water supply contracts call for the annual delivery of up to 4,172,126 acre-feet (af) of Table A water during 2011, gradually increasing to a maximum of 4,172,786 af by 2016. (Annual Table A amounts are shown in Table 1-6 and in Chapter 9, Water Contracts and Deliveries.) Some changes have occurred since the long-term water contracts were signed in the 1960s, including population growth, differences in local water use, local water conservation programs, and conjunctive-use programs. Demands for SWP water are expected to increase as California's population continues to grow. For detailed information about 2011 SWP deliveries, see Chapter 9, Water Contracts and Deliveries.

Project Design

Water from rainfall and snowmelt runoff is stored in SWP conservation facilities and delivered via SWP transportation facilities to water agencies and districts in the Upper Feather River, North Bay, South Bay, San Joaquin, Central Coastal, and Southern California areas.

Three small reservoirs—Antelope Lake, Lake Davis, and Frenchman Lake—are the northernmost SWP facilities. Situated on Feather River tributaries in Plumas County, these lakes are used primarily for recreation. They also provide water to the City of Portola and local agencies that have water rights agreements with DWR.

Downstream from these lakes lies Lake Oroville, which conserves water from the Feather River watershed. Created by Oroville Dam, the tallest earthfill dam in the Western Hemisphere, Lake Oroville is the project's

largest storage facility with a capacity of approximately 3.5 million af.

Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern portion of California's great Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta, comprising 738,000 acres of land interlaced with channels that receive runoff from 40 percent of the State's land area. The SWP, federal Central Valley Project (CVP), and local agencies all divert water from the Delta.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano counties through the North Bay Aqueduct, which was completed in 1988. Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. Banks Pumping Plant lifts water from Clifton Court Forebay into the California Aqueduct, which flows to Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct to supply Alameda and Santa Clara counties. The South Bay Aqueduct provided initial deliveries in 1962 and has been fully operational since 1965.

Most of the water delivered to Bethany Reservoir from Banks Pumping Plant flows into the California Aqueduct. This 444-mile-long main aqueduct conveys water to the agricultural lands of the San Joaquin Valley and to the urban regions of Southern California.

The California Aqueduct winds along the west side of the San Joaquin Valley. It transports water to O'Neill Forebay, Gianelli Pumping-Generating Plant, and San Luis Reservoir. San Luis Reservoir has a storage capacity of more than 2 million af and is jointly owned by DWR and the Bureau of Reclamation (Reclamation). DWR's share of gross storage in the reservoir is 1,062,183 af. Generally, water is pumped into San Luis



Figure 1-1 Names and Locations of Primary Water Delivery Facilities, December 31, 2011

Reservoir from late fall through early spring, where it is temporarily stored for release back to the California Aqueduct to meet summertime peaking demands of SWP and CVP water contractors.

SWP water not stored in San Luis Reservoir and water released from San Luis flows south through the San Luis Canal, a portion of the California Aqueduct jointly owned by DWR and Reclamation.

As the water flows through the San Joaquin Valley, numerous turnouts convey it to farmlands within the service areas of the SWP and CVP. Along its journey, this water is lifted more than 1,000 feet by four pumping plants—Dos Amigos, Buena Vista, Teerink, and Chrisman—before reaching the foot of the Tehachapi Mountains.

In the southern San Joaquin Valley, near Kettleman City, Phase I of the Coastal Branch Aqueduct serves agricultural areas west of the California Aqueduct. In August 1997, completion of Phase II extended the Coastal Branch Aqueduct to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, home to roughly two-thirds of California's population. Before it can be delivered, the water must first cross the Tehachapi Mountains. Fourteen 80,000-horsepower pumps at Edmonston Pumping Plant, situated at the foot of the mountains, raise the water 1,926 feet—the highest single lift of any pumping plant in the world. The water enters 8.5 miles of tunnels and siphons as it flows into Antelope Valley, where the California Aqueduct divides into two branches: the East Branch and the West Branch.

The East Branch carries water through Alamo Powerplant, Pearblossom Pumping Plant, and Mojave Siphon Powerplant into

Silverwood Lake in the San Bernardino Mountains. From Silverwood Lake, water flows through the San Bernardino Tunnel to Devil Canyon Powerplant. Water continues down the East Branch through the Santa Ana Pipeline to Lake Perris, the southernmost SWP reservoir.

The East Branch Extension is a nearly 33-mile pipeline linking parts of service areas for San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency to the California Aqueduct. The East Branch Extension, Phase I, carries water from Devil Canyon Powerplant Afterbay to Cherry Valley, bringing water to Yucaipa, Calimesa, Beaumont, Banning, and other communities. Phase II, when completed, will assist with this delivery.

Water in the West Branch flows through Oso Pumping Plant, Quail Lake, and then from the Peace Valley Pipeline through Warne Powerplant into Pyramid Lake in Los Angeles County. From there it flows through the Angeles Tunnel, Castaic Powerplant, Elderberry Forebay, and into Castaic Lake, terminus of the West Branch. Castaic Powerplant is operated by the Los Angeles Department of Water and Power.

The energy needed to operate the SWP, the largest single user of electrical power in California, comes from a combination of its own hydroelectric and coal-fired generating plants and power purchased from and exchanged with other utilities. The coal-fired plant and the project's eight hydroelectric power plants, including four pumping-generating plants, produce enough electricity in a normal year to supply about two-thirds of the SWP's necessary operating power.

Tables 1-1 through 1-5 present statistical information about primary storage facilities, primary dams, pumping plants, power plants, and aqueducts.

Table 1-1 Physical Characteristics of Primary Storage Facilities

Facility	Data at Absolute Maximum Elevation		
	Gross Capacity (Acre-feet)	Surface Area (Acres)	Shoreline (Miles)
Antelope Lake	22,600	930	15
Frenchman Lake	55,500	1,580	21
Lake Davis	84,400	4,030	32
Lake Oroville	3,537,600	15,810	167
Thermalito Forebay	11,800	630	10
Thermalito Afterbay	57,000	4,300	26
Thermalito Diversion Pool	13,400	320	10
Clifton Court Forebay	31,300	2,180	8
Bethany Reservoir	5,100	180	6
Lake del Valle	77,100	1,060	16
San Luis Reservoir	2,027,800	12,520	65
SWP storage, 1,062,183 af			
O'Neill Forebay	56,400	2,700	12
SWP storage, 29,500 af			
Los Banos Reservoir	34,600	620	12
Little Panoche Reservoir	5,600	190	6
Quail Lake	7,600	290	3
Pyramid Lake	171,200	1,300	21
Elderberry Forebay	32,500	500	7
Castaic Lake	323,700	2,240	29
Silverwood Lake	75,000	980	13
Lake Perris	131,500	2,320	10

Future Planning and Construction

SWP aqueduct facilities were initially designed and constructed to provide service to all agencies to meet their water delivery needs up to 1990. Project water conservation reservoirs were planned to be constructed in stages as water demands increased. Oroville and San Luis were the first SWP conservation reservoir facilities constructed. Additional facilities were scheduled to meet increased demands. It was anticipated that population

growth in delivery service areas and water supply areas of origin would influence the final schedule for additional SWP facilities. Increasingly, issues such as escalating costs, environmental concerns, and increased non-SWP demands for limited water supplies have become important factors affecting the planning and construction of new facilities.

In response to changes in water management policy, DWR continues to reassess plans for additional facilities that will incorporate increased environmental safeguards while also increasing the SWP delivery yield. Developing these plans involves the time consuming process of finding technically suitable projects and satisfying many complex and dynamic environmental procedures, laws, and regulations.

Climate Change

Planners are also concerned about climate change and its potentially serious effects on water resources. Temperature increases may affect water demand and aquatic ecosystems. Projected increases in air temperature may lead to changes in the amount, timing, and form of precipitation—rain or snow; changes in the volume and timing of runoff; Delta water quality changes due to sea-level rise; and changes in the amount of irrigation water needed due to modified evapotranspiration rates.

The ability of the SWP and CVP to meet the water demands of their customers and the environment depends on the accumulation of mountain snow and subsequent spring and summer snowmelt runoff. A warming climate may reduce this natural water storage mechanism.

To address these concerns, DWR and Reclamation formed a joint Climate Change Work Team to provide qualitative and quantitative assessments of the potential risks and effects of climate change on

Table 1-2 Physical Characteristics of Primary Dams

Facility	Crest Elevation (Feet)	Structural Height (Feet)	Crest Length (Feet)	Structural Volume (Thousand Cubic Yards)
Antelope	5,025	120	1,320	380
Frenchman	5,607	139	720	537
Grizzly Valley	5,785	132	800	253
Oroville	922	770	6,920	80,000
Thermalito Diversion	233	143	1,300	154
Thermalito Forebay	231	91	15,900	1,840
Thermalito Afterbay	142	39	42,000	5,020
Clifton Court Forebay	14	30	36,500	2,440
Bethany	250	121	3,940	1,400
Del Valle	773	235	880	4,150
Sisk	554	385	18,600	77,645
O'Neill Forebay	233	88	14,350	3,000
Los Banos Detention	384	167	1,370	2,100
Little Panoche Detention	676	152	1,440	1,210
Pyramid	2,606	400	1,090	6,800
Elderberry Forebay	1,550	200	1,990	6,000
Castaic	1,535	425	4,900	46,000
Cedar Springs	3,378	249	2,230	7,600
Perris	1,600	128	11,600	20,000
Crafton Hills	2,932	95	500	144

Table 1-3 Pumping Plant Characteristics

Facility	Number of Units	Normal Static Head (Feet)	Total Flow at Design Head (cfs)	Total Motor Rating (hp)
Robie Thermalito	3 (p-g) ^a	85-102	9,120	120,000
Hyatt	3 (p-g) ^a	500-625	5,610	519,000
Barker Slough	9	95-120	228	4,800
Cordelia	11	138		
Banks	11	236-252	10,670	333,000
South Bay	9	566	330	27,750
Del Valle	4	0-38	120	1,000
Gianelli	8 (p-g) ^a	99-327	11,000	504,000
Dos Amigos	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,050
Badger Hill	6	151	454	11,750
Devil's Den ^b	6	521	134	10,500
Bluestone ^b	6	484	134	10,500
Polonio Pass ^b	6	533	134	10,500
Buena Vista ^b	10	205	5,405	144,500
Teerink ^b	9	233	5,445	150,000
Chrisman ^b	9	518	4,995	330,000
Edmonston ^b	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	540	2,575	203,200
Greenspot	4	382	50	3,900
Crafton Hills	3	613	40	4,000
Cherry Valley	2	130	75	300

^aThe term p-g indicates pumping-generating units.

^bThese plants have one unit in reserve.

Table 1-4 Power Plant Characteristics, by Type and Facility

Type and Facility	Number of Units	Normal Static Head (Feet)	Total Flow at Design Head (cfs)	Net Dependable Capacity (MW)	Nameplate Capacity (MW)
Hydro					
Thermalito Diversion Dam	1	63-77	615	3	3
Robie Thermalito	4 (3 p-g) ^a	85-102	17,400	114	114
Hyatt	6 (3 p-g) ^a	410-676	16,950	645	645
Gianelli (total)	8 p-g ^a	99-327	16,960	363	424
Alamo	1	115-141	1,740	15	17
Warne	2	719-739	1,600	67	74
Mojave Siphon	3	81-136	2,880	29	30
Devil Canyon	4	1,406	2,940	235	276
Castaic ^d	7 (6 p-g) ^a	900-1,050	20,820	1,128	1,254
Coal					
Reid Gardner, Unit 4 (total) SWP share of generation ^c	1 ^b			234	275

^a The term p-g indicates pumping-generating units.

^b Life of the plants is expected to extend through 2013.

^c SWP ownership share in Reid Gardner, Unit 4, is 67.8%.

^d Castaic Pumping-Generating Plant is owned and operated by the Los Angeles Department of Water and Power.

Table 1-5 Total Miles of Aqueducts

Facility	Channel and Reservoir	Canal and Siphon	Pipeline and Discharge Line	Tunnel	Total
Grizzly Valley Pipeline	0.0	0.0	6.0	0.0	6.0
Thermalito Power Canal and Tail Channel	1.5	1.9	0.0	0.0	3.4
North Bay Aqueduct	0.0	0.0	27.6	0.0	27.6
South Bay Aqueduct (including Del Valle Branch)	0.3	10.7	31.9	1.7	44.6
<i>Subtotal</i>	<i>1.8</i>	<i>12.6</i>	<i>65.5</i>	<i>1.7</i>	<i>81.6</i>
California Aqueduct					
Clifton Court Forebay to O'Neill Forebay	4.5	61.9	0.3	0.0	66.7
O'Neill Forebay to Kettleman City	4.1	101.4	0.2	0.0	105.7
Kettleman City to Edmonston Pumping Plant	0.0	120.1	0.9	0.0	121.0
Edmonston Pumping Plant to Tehachapi Afterbay	0.0	0.2	1.9	7.9	10.0
Tehachapi Afterbay to Lake Perris	4.0	97.8	34.3	3.9	140.0
<i>Subtotal</i>	<i>12.6</i>	<i>381.4</i>	<i>37.6</i>	<i>11.8</i>	<i>443.4</i>
California Aqueduct Branches					
Coastal Branch	0.0	14.1	98.7	2.7	115.5
West Branch	9.7	9.3	5.8	7.1	31.9
East Branch Extension					
Devil Canyon Powerplant to Greenspot Pumping Station	0.0	0.0	16.2	0.0	16.2
Greenspot Pumping Station to Noble Creek Terminus	0.0	0.0	16.4	0.0	16.4
<i>Subtotal</i>	<i>9.7</i>	<i>23.4</i>	<i>137.1</i>	<i>9.8</i>	<i>180.0</i>
Total	24.1	417.4	240.2	23.3	705.0

California’s water resources. The team will regularly update decision makers on climate change impacts, the ability of existing facilities to accommodate these impacts, and available mitigation measures.

In response to changes brought about by population growth, environmental concerns, climate change, and other factors, DWR continues to plan, design, and construct transportation and power-producing facilities for the SWP.

For more information about current SWP planning and construction, see Chapter 12, Engineering, Construction, and Real Estate. Information about prior construction activities can be found in previous issues of Bulletin 132.

Methods of Financing

Project facilities have been constructed with several general types of financing: general obligation bonds and tideland oil revenues (under the Burns-Porter Act, which was approved by the Legislature in 1959, and the bond issue approved by voters in 1960); revenue bonds; and capital resources revenues. Repayment of these funds, and the operations, maintenance, power, and replacement costs associated with water supply, are paid by the 29 agencies and districts that have long-term contracts with DWR for the delivery of SWP water.

Long-term Contracting Agencies

From 1963 through 1967, 32 agencies or districts signed long-term water supply contracts with DWR. However, in 1965, the City of West Covina was annexed to The Metropolitan Water District of Southern California, and in 1981, Hacienda Water District was assigned to Tulare Lake Basin Water Storage District. On January 1, 1992, Castaic Lake Water Agency assumed all

rights and obligations granted to Devil’s Den Water District in accordance with its long-term water supply contract. Therefore, only 29 agencies and districts have long-term contracts with DWR as of December 31, 2011.

The contracts initially provided for a combined maximum annual Table A amount of 4,230,000 af of water supply. As a result of contract amendments in the 1980s and the Monterey Amendment, the current combined maximum annual Table A amount by 2016 totals 4,172,786 af. The contracts are in effect for the longest of the following periods:

- the project repayment period, which extends to the year 2035;
- 75 years from the date of the contract; or
- the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

Figure 1-2 shows the name and location of each contracting agency and district and lists the first year of SWP delivery service for each. Table 1-6 presents more detailed information about each contracting agency.

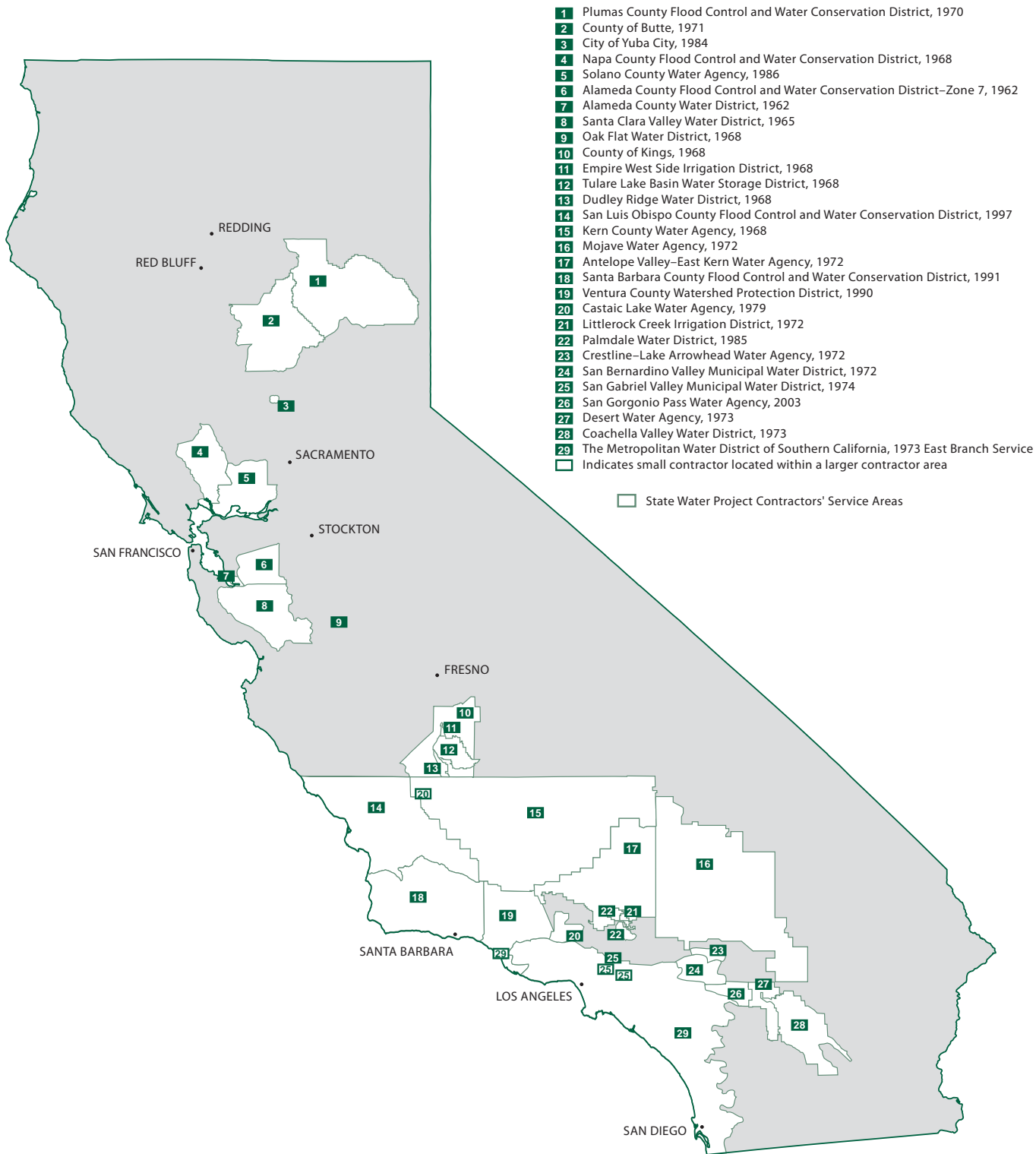


Figure 1-2 Names, Locations, and First Year of Service of Long-term Contracting Agencies, December 31, 2011

Table 1-6 Long-term Water Supply Contracting Agencies, by Area, as of December 31, 2011

Contracting Agency	Cumulative Deliveries (af) ^a	Annual Table A (af)	Payments (in dollars) ^b	Gross Area (acres)	Assessed Valuation (in dollars) ^b	Estimated Population
Upper Feather River Area						
City of Yuba City	33,492	9,600	5,829,880	9,332	4,400,000,000	63,338
County of Butte	35,647	27,500	3,197,333	1,049,280	17,891,000,000	221,609
Plumas County Flood Control and WCD	12,254	2,240	1,855,483	1,676,056 ^c	2,060,744,342	21,200
<i>Subtotal</i>	<i>81,393</i>	<i>39,340</i>	<i>10,882,696</i>	<i>2,734,668</i>	<i>24,351,744,342</i>	<i>306,147</i>
North Bay Area						
Napa County Flood Control and WCD	291,302	29,025	101,635,136	510,010	26,755,229,545	136,704
Solano County Water Agency	737,778	47,556	136,843,471	581,760	39,100,000,000	414,509
<i>Subtotal</i>	<i>1,029,080</i>	<i>76,581</i>	<i>238,478,607</i>	<i>1,091,770</i>	<i>65,855,229,545</i>	<i>551,213</i>
South Bay Area						
Alameda County Flood Control and WCD–Zone 7	1,442,835	80,619	222,285,925	275,900	39,514,000,000	224,000
Alameda County WD	1,228,377	42,000	118,050,268	67,200	46,622,164,000	326,000
Santa Clara Valley WD	3,933,997	100,000	356,031,813	849,000	299,096,733,565	1,781,642
<i>Subtotal</i>	<i>6,605,209</i>	<i>222,619</i>	<i>696,368,006</i>	<i>1,192,100</i>	<i>385,232,897,565</i>	<i>2,331,642</i>
San Joaquin Valley Area						
County of Kings	136,971	9,305	8,177,724	893,300	8,803,841,689	152,982
Castaic Lake Water Agency ^d	471,637	0		8,700 ^e	4,532,936	0
Dudley Ridge WD	2,265,362	50,343	87,243,430	37,600	87,100,000	36
Empire West Side Irrigation District	119,010	3,000	4,259,427	7,400		11
Kern County Water Agency	34,337,478	982,730	1,924,962,778	5,224,000	84,668,017,000	808,808
Oak Flat WD	205,540	5,700	6,909,969	4,500		10
Tulare Lake Basin Water Storage District	4,785,801	88,922	168,571,292	189,519	180,000,000	23
<i>Subtotal</i>	<i>42,321,799</i>	<i>1,152,700</i>	<i>2,200,124,620</i>	<i>6,365,019</i>	<i>93,743,491,625</i>	<i>961,870</i>
Central Coastal Area						
San Luis Obispo County Flood Control and WCD	67,699	25,000	82,841,242	2,122,240	38,774,371,889	274,092
Santa Barbara County Flood Control and WCD	313,074	45,486	550,193,834	1,775,296	49,196,921,210	421,625
<i>Subtotal</i>	<i>380,773</i>	<i>70,486</i>	<i>633,035,076</i>	<i>3,897,536</i>	<i>87,971,293,099</i>	<i>695,717</i>
Southern California Area						
Antelope Valley-East Kern Water Agency	1,885,562	141,400	499,364,315	1,525,547	22,806,924,609	289,335
Castaic Lake Water Agency	884,271	95,200	308,433,521	124,800 ^e	32,606,365,480	266,800
Coachella Valley WD	1,189,435	138,350	400,232,964	639,857	50,173,562,871	286,240
Crestline-Lake Arrowhead Water Agency	55,305	5,800	25,973,485	54,777	2,562,640,010	30,315
Desert Water Agency	1,202,012	55,750	271,807,262	209,760	7,350,594,400	71,072
Little Rock Creek Irrigation District	21,937	2,300	6,552,487	10,000	372,988,910	2,900
The Metropolitan WD of Southern California	33,610,276	1,911,500	10,054,252,945	3,314,621 ^f	2,103,656,331,845	18,559,751
Mojave Water Agency	353,071	82,800	273,210,746	3,118,720	27,703,450,175	456,508
Palmdale WD	247,871	21,300	78,030,662	119,680	1,476,805,945	103,994
San Bernardino Valley Municipal WD	794,954	102,600	569,421,814	225,576	37,859,084,422	665,370
San Gabriel Valley Municipal WD	388,718	28,800	153,843,131	18,297	11,720,110,333	210,145
San Geronio Pass Water Agency	38,976	17,300	128,714,412	140,800	581,148,848	75,000
Ventura County Watershed Protection District	61,568	20,000	61,028,739	308,252	25,763,165,853	460,000
<i>Subtotal</i>	<i>40,733,956</i>	<i>2,623,100</i>	<i>12,830,866,483</i>	<i>9,810,687</i>	<i>2,324,633,173,701</i>	<i>21,477,430</i>
Total	91,152,210	4,172,126	16,609,755,488	25,091,780^g	2,981,787,829,877	26,324,019

^a All water delivered to long-term SWP contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.
^b Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100% of full value for the 1981–1982 fiscal year and fiscal years thereafter.
^c Total of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.
^d Assessed valuation not available on an agency area breakdown.
^e Castaic Lake Water Agency (Southern California Area) includes land in the San Joaquin Valley Area formerly known as Devil’s Den Water District.
^f Total for Metropolitan, including Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.
^g Includes duplicate values. Some areas that are within two or more agencies are included in each agency’s total.
^h Includes all payments pursuant to the repayment provisions of the Water Supply Contracts. Historic Transportation and Conservation Replacement Accounting System payments are included in this table for the first time and will be included going forward.
ⁱ Formerly Devil’s Den Water District. Castaic Lake Water Agency acquired Devil’s Den Water District’s Table A allocation in 1992.



Chapter 2 Delta Resources

Patterns in the Delta.

Significant Events in 2011

In November 2011, the draft program environmental impact report for the Delta Stewardship Council's *Delta Plan* was released for public review and comment.

The Delta Risk Management Strategy Phase 2 Report was released.

Information for this chapter was contributed by the FloodSAFE Environmental Stewardship and Statewide Resources Office, the Bay-Delta Office, and the Division of Flood Management.

The Sacramento-San Joaquin Delta is a unique environmental resource and a major source of water for millions of Californians. Over the past 40 years, the Department of Water Resources (DWR) and other State and federal agencies have developed and implemented numerous programs to manage the Delta.

DWR's water management programs focus on solving problems in three areas of the Sacramento-San Joaquin Delta: the North Delta, West Delta, and South Delta (see Figure 2-1).

These programs share common goals to:

- improve water supply reliability to the State Water Project (SWP), Central Valley Project (CVP), and Delta water users;
- determine levels of flow and salinity necessary to protect fish and wildlife habitat;
- devise methods to control flooding;
- protect fish and wildlife; and
- provide recreational activities.

Delta Water Management Programs

Future water deliveries to millions of Californians throughout the State will be affected by many factors, including two significant changes: Delta pumping restrictions and climate change.

The CALFED Bay-Delta Program (CALFED) first attempted to address these changes. In 2009, the Delta Stewardship Council (DSC) was established and replaced the function of CALFED (see sidebar, Delta Stewardship Council). In February 2010, DSC assumed the administrative rights, obligations, and duties of the California Bay-Delta Authority. DSC is in the process of developing and implementing a comprehensive Delta Plan based on the Delta Vision (see Bulletin 132-10).

The Bay Delta Conservation Plan (BDCP) is being developed in compliance with the federal Endangered Species Act and the California Natural Community Conservation Planning Act. When complete, the BDCP will provide the basis for the issuance of endangered species permits for the operation of the State and federal water projects. The plan would be implemented over the next 50 years. The heart of the BDCP is a long-term conservation strategy that sets forth actions needed for a healthy Delta.

For more information regarding BDCP, see Chapter 3, Environmental Programs.

The SWP and CVP obtained take authorization for federal Endangered Species Act and California Endangered Species Act listed species for coordinated operations in the Delta through a U.S. Fish and Wildlife Service biological opinion (BO) for Delta Smelt in December 2008, a Department of Fish and Wildlife incidental take permit for Longfin Smelt in February 2009, and a National Marine Fisheries Service (NOAA Fisheries) BO for salmon, steelhead, and Green Sturgeon in June 2009. Some of the requirements in these documents were implemented right away, while other requirements needed development of studies and projects before being implemented. The Bay-Delta Office and Division of Environmental Services have begun developing studies and projects. The operational requirements are being implemented by the Division of Operations and Maintenance. Some of the projects and studies being developed include improving existing fish release sites and identifying two new fish release sites; planning a

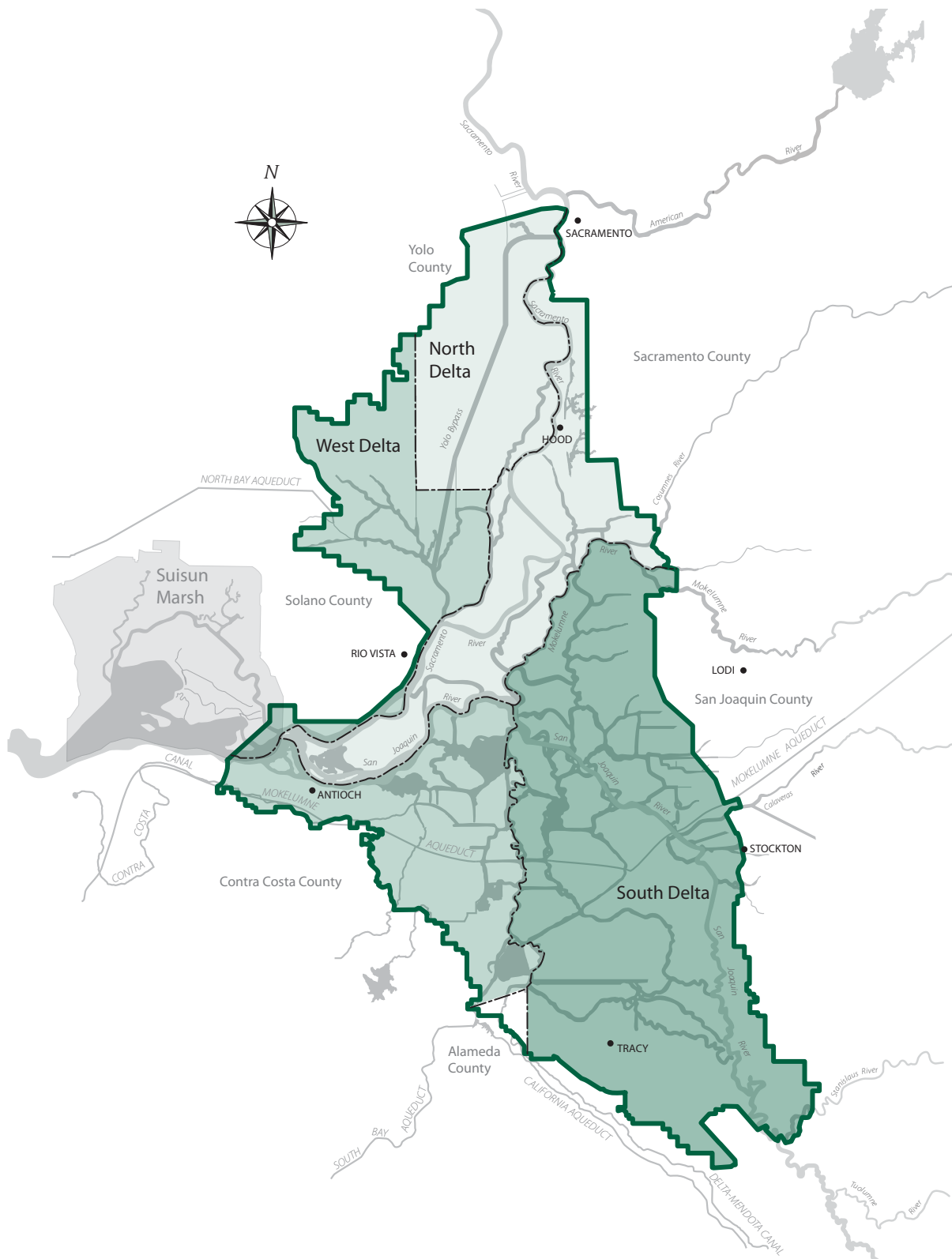


Figure 2-1 The North, West, and South Delta as Defined in Public Resources Code Section 29735

Delta Stewardship Council

Created by the Legislature under the Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act), the Delta Stewardship Council (DSC) is an independent agency of the State of California composed of members who represent different parts of the State and offer diverse expertise in fields such as agriculture, science, the environment, and public service. Of the seven members, four are appointed by the Governor, one each by the Senate and Assembly, and the seventh is the Chair of the Delta Protection Commission. The council is the successor to the California Bay-Delta Authority and assumes all of its administrative rights, abilities, obligations, and duties.

The DSC is mandated by law to develop, adopt, and begin implementing a legally enforceable, comprehensive, long-term management plan for the Sacramento-San Joaquin Delta by January 1, 2012. The *Delta Plan* will establish a set of integrated, legally enforceable policies, strategies, and actions to guide State and local agencies to help achieve coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. It will also guide protection and enhancement of the unique resources, culture, and values of the Delta as an evolving place (California Water Code Section 85054).

The Delta Reform Act also specifies eight policy objectives that are “inherent” in the coequal goals (see Water Code Section 85020); a related statewide policy to reduce reliance on the Delta in meeting the State’s future water supply needs through improved regional water self-reliance (Water Code Section 85021); and certain specific subjects and strategies that must be included in the Delta Plan (see generally, Water Code Sections 85301–85309).

The Delta Reform Act also established the Delta Science Program and Delta Independent Science Board (ISB) to provide the scientific support and oversight the DSC needs to make decisions based on sound science. Members of both are appointed by the DSC. The Delta Science Program replaces the CALFED Science Program, and the Delta ISB replaces the CALFED ISB.

The Delta Science Program will develop scientific information and synthesis on issues critical for managing the Bay-Delta system. That body of knowledge must be unbiased, relevant, authoritative, integrated across State and federal agencies, and communicated to Bay-Delta decision-makers, agency managers, stakeholders, the scientific community, and the public.

The Delta ISB is a standing board of nationally and internationally prominent scientists with appropriate expertise to evaluate the broad range of scientific programs that support adaptive management of the Delta. The Delta ISB will provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management of the Delta through periodic reviews of each of those programs. The overall objective of Delta ISB oversight is to ensure that the science supporting Bay-Delta programs, the application of that science, and the technical aspects of the Bay-Delta programs are optimally developed and implemented.

fishing facility and associated predation study for Clifton Court Forebay; evaluating the screening efficiency of Skinner Fish Facility; and evaluating fish screens at Barker Slough Pumping Plant, Roaring River Slough Distribution System, and diversions around Sherman Island. Also, a fish science building is being planned to hold and rear fish for use in the studies and projects needed to comply with the BOs and incidental take permit.

Delta Plan

The Governor's Delta Vision Blue Ribbon Task Force issued the *Delta Vision Strategic Plan* in November 2008. It outlined strategies for addressing a range of threats facing the Delta and called for the Delta to be managed according to two coequal goals: "Restore the Delta ecosystem and create a more reliable water supply for California."

In 2009, the Legislature and Governor enacted a bill package dealing with water policy and the Delta. Among other things, Senate Bill X7 1 enacted the Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act). Programs authorized by the act were designed according to the recommendations in the *Delta Vision Strategic Plan*. The Delta Reform Act created two new agencies, the DSC and the Sacramento-San Joaquin Delta Conservancy. The bill also amended key provisions governing the organization and operations of the Delta Protection Commission.

The DSC's mission is to implement the coequal goals of water supply reliability and ecosystem restoration described in the strategic plan. DSC replaces the function of CALFED and assumes all of the administrative rights, abilities, obligations, and duties of the California Bay-Delta Authority. The Delta Reform Act requires the DSC to adopt a comprehensive, long-term management plan for the Delta (*Delta Plan*).

Throughout 2011, the DSC continued to develop the draft *Delta Plan*. From February to August 2011, the DSC released five draft versions of the plan for public review. At each stage of the development of the *Staff Draft Delta Plan* there were public meetings at the DSC meetings for the purpose of receiving information and comments and for DSC deliberation. In addition, public comments were welcome during the entire process and became a formal part of the record. In November 2011, the draft program environmental impact report (EIR) (evaluating the *Fifth Staff Draft Delta Plan*) was released for public review and comment.

For more information regarding the Delta Reform Act, visit the California legislative information website, DSC's website, or the Delta Vision website.

Delta Risk Management Strategy

The overall purpose of the Delta Risk Management Strategy (DRMS) is to complete an evaluation of levee failure risks in the Delta and Suisun Marsh. The Phase 1 report, released in 2009, provided analysis of various risks to levees and the local and statewide consequences of levee failure.

Phase 2 identified and analyzed measures to reduce risks to the Delta and the State from the consequences of levee failure. In 2011, the DRMS project released the Phase 2 report. The Phase 2 report built on the knowledge gained from the DRMS Phase 1 assessment. The information in the report provided insight on methods that may be used by DWR and others to manage risk.

More information about the DRMS is available on DWR's website.

North Delta Program

Since 2003, DWR has evaluated changes in the North Delta's conveyance facilities to improve Delta water quality, fisheries, and water supply reliability, and to improve flood protection and ecosystem health.

North Delta actions include:

- evaluation and implementation of improved operational procedures for the Delta Cross Channel to address fishery and water quality concerns;
- evaluation of a screened through-Delta facility on the Sacramento River of up to 4,000 cubic feet per second (cfs);
- evaluation of flow and salinity in Franks Tract to improve fish protection and improve water quality through installation of operable barriers in the Franks Tract region; and
- design and construction of floodway improvements to provide conveyance, flood control, and ecosystem health (North Delta Flood Control and Ecosystem Restoration Project).

In 2009, work on several projects was suspended as a result of the State's fiscal crisis. The Delta Regional Salmon Outmigration Study, undertaken as part of the Delta Cross Channel evaluations to address fishery and water quality concerns, was not completed. The last phase of the field study and subsequent data analysis were suspended. In 2010, efforts were made to resume analysis of data that were collected in the winter of 2008–2009. U.S. Geological Survey (USGS) staff contracted to conduct the Salmon Outmigration Study were not readily available to do the analysis work in 2010 and 2011. However, it is expected the work will resume in 2012.

Work continued on the environmental impact statement (EIS)/EIR for the Franks Tract Project, which involves installation

of operable barrier(s) in river channel(s) around the Franks Tract region to reduce sea water intrusion and enhance conditions for sensitive fish species. Progress was slowed due to the increased workload from the BOs and incidental take permit and reduced participation from the project's federal partner, the Bureau of Reclamation. However, a sensitivity model analysis was done to assess the benefits of the project under the new BO and incidental take permit for SWP and CVP operations and with or without implementation of the Delta Habitat Conservation and Conveyance Program (DHCCP). Preliminary results showed the Franks Tract Project would benefit water quality even with the DHCCP.

For more information about North Delta Program activities, see Chapter 7, Water Supply Development and Reliability, or DWR's website.

North Delta Flood Control and Ecosystem Restoration Project

The proposed North Delta Flood Control and Ecosystem Restoration Project (NDFCERP) would provide flood control improvements and ecosystem restoration in the North Delta. The project will implement important flood control improvements in the area of the North Delta where the Mokelumne River, Cosumnes River, Dry Creek, and Morrison Creek converge (see Figure 2-2). Flood flows in the area threaten levees, bridges, and roadways when levees on McCormack-Williamson Tract (MWT) are overtopped and a flood surge occurs. The proposed project will help regulate peak flood flows and prevent flood surges. It will also provide substantial aquatic and terrestrial habitat benefits.

The final NDFCERP EIR was certified in November 2010 and recommended the implementation of the preferred alternative (Alternative 1-A for the Group I actions and the No Action Alternative for the Group II actions [see Bulletin 132-11]). The project

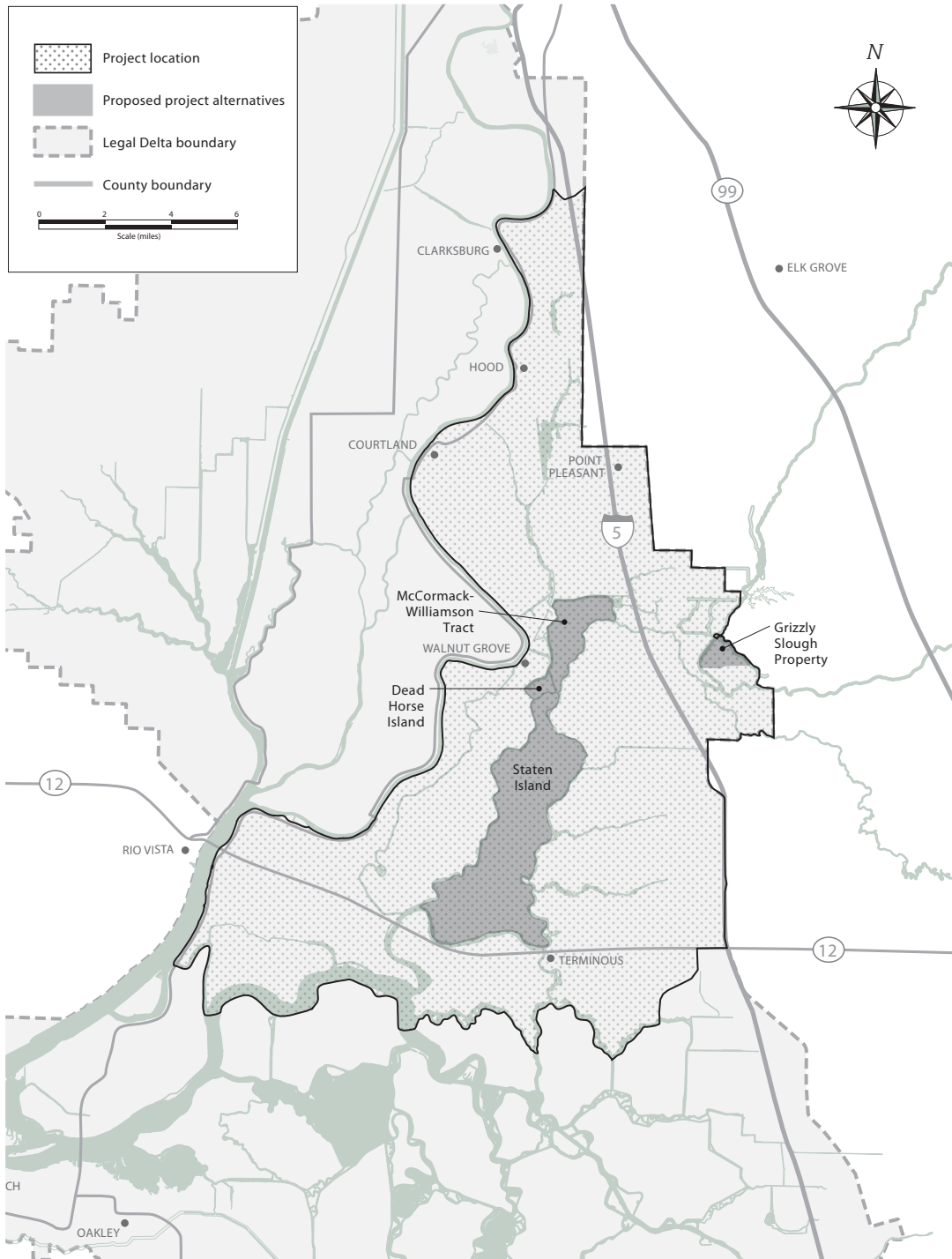


Figure 2-2 North Delta Flood Control and Ecosystem Restoration Project, Project Area

will create tidal, subtidal, aquatic, and terrestrial habitats benefiting a number of special status species such as Sacramento Splittail and Chinook Salmon. The project, as proposed, will provide contiguous habitat and a riparian corridor from the downstream portion of the Cosumnes River Preserve to the Delta.

The following project elements are proposed for implementation over a 6-year timeline: the MWT element combines North Delta flood surge reduction measures with the construction of habitat-friendly levees, floodplain restoration, and the creation of freshwater tidal habitat on MWT. The MWT property, purchased using a CALFED grant, is currently owned and managed by The Nature Conservancy. When completed, the MWT element will result in nearly 1,500 acres of tidal marsh and floodplain restoration, consistent with the objectives put forth in the evolving Delta Plan and BDCP. The Grizzly Slough element consists of breaching the Grizzly Slough and Bear Slough levees near MWT to help attenuate peak flood flows and maximize nearly 500 acres of floodplain habitat on the DWR-owned property.

Project Status. Through the CALFED Levee Stability Program, the U.S. Army Corps of Engineers expressed renewed interest in the flood control and ecosystem restoration actions proposed for MWT (a component of the NDFCERP). After the Corps tentatively committed federal funds to evaluate the project for its involvement, DWR and the local reclamation district negotiated an agreement to support project planning with the Corps. The agreement was amended in 2011 to provide additional funds to support the work; and DWR and Reclamation District 2110 awaited notification that the federal agreement was approved in order to complete the Project Implementation Report including the final project design.

For more information on the NDFCERP and the project elements, visit DWR's website.

West Delta Program

The West Delta Program is a part of the Special Investigations Branch in the FloodSAFE Environmental Stewardship and Statewide Resources Office with specific SWP-related objectives that include the following:

- effectively managing SWP-owned lands on Sherman and Twitchell islands (approximately 12,500 acres total);
- improving the integrity of local levees;
- implementing land-use management techniques to control subsidence and soil erosion on Sherman and Twitchell islands; and
- providing diverse habitat for wildlife, especially waterfowl.

DWR is a major landowner on Twitchell and Sherman islands and holds two of the three trustee positions for Reclamation Districts 1601 (Twitchell Island) and 341 (Sherman Island). Consequently, DWR, through the West Delta Program, participates in the management and operation of each district, with the goal of improving conditions and accountability. The reclamation districts provide levee maintenance, island drainage, and some internal water supply. These districts assess the landowners for the operational needs of the public districts.

South Delta Improvements Program

In 1999, the South Delta facilities became a key component of CALFED.

South Delta Improvements Program (SDIP) elements in the CALFED record of decision included increasing diversions through Clifton Court Forebay (first to 8,500 cfs and then to 10,300 cfs), dredging and installing operable tidal barriers in the South Delta, installing a fish barrier at Head of Old River, and constructing the first phase of a new intake and fish screen in Clifton Court

Forebay. SDIP is proposed to be implemented in two component stages.

The SDIP Stage 1 component comprises proposed physical/structural improvements that include constructing and utilizing permanent operable gates, dredging, and modifying agricultural diversions. The SDIP Stage 2 component comprises proposed operational changes to increase water deliveries and improve delivery reliability south of the Delta.

DWR and the Bureau of Reclamation (Reclamation) identified the following SDIP project objectives and purposes:

- reducing movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River (SDIP Stage 1);
- maintaining adequate water levels and water quality through improved circulation for agricultural diversions in the South Delta, downstream of Head of Old River (SDIP Stage 1);
- increasing water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta (SDIP Stage 2); and
- providing opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay to 8,500 cfs (SDIP Stage 2).

The SDIP Stage 1 physical/structural component includes the following elements:

- constructing and operating a fish-control gate at Head of Old River to reduce downstream movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via the Head of Old River;

- constructing and operating up to three flow-control structures (gates) at Middle River (near the confluence of Middle River with Victoria Canal); Grant Line Canal (near the confluence of Grant Line Canal and Old River); and Old River (just east of the Delta-Mendota Canal intake) to improve existing water level and circulation patterns in South Delta water channels;
- dredging various channels in the South Delta, including Middle and Old rivers, to improve conveyance; and dredging areas surrounding agricultural diversions to improve their function; and
- extending up to 24 agricultural diversion intake facilities to improve their function.

The SDIP final EIR/EIS (2006) determined the preferred alternative for SDIP Stage 1, which entails installation of permanent control gates to replace temporary structures currently installed and removed each year under the DWR Temporary Barriers Project. The preferred alternative also includes the elements of dredging and extending agricultural diversions.

Preferred Plan

The preferred plan for SDIP is to construct the physical/structural component as soon as permits are obtained and defer the operational component until more is known about the project's potential effects on the Delta Smelt and other protected fish species.

DWR deferred the increase in diversions of up to 10,300 cfs and the associated new fish screens as components of the SDIP due to major funding issues as well as significant technical uncertainties associated with the design and construction of the new fish screens.

Program Status

DWR and Reclamation continued to suspend most SDIP planning and permitting activities during 2011. Some activities were

undertaken to address requirements of the 2009 NOAA Fisheries BO for the CVP and SWP Long-term Operations Criteria and Plan.

Discussions between DWR and NOAA Fisheries revealed NOAA Fisheries' concern for potential barrier hydraulic disturbances which could promote increased predation on juvenile salmon. DWR conducted a hydrodynamic study focusing on barrier design features to minimize these disturbances. A study report was submitted to NOAA Fisheries in April 2010, which identified several features that could be incorporated into the design.

NOAA Fisheries stated an interest to hold off further discussions on the SDIP until completion of an on-going multiyear South Delta Temporary Barriers Project predation study. The study is being conducted to satisfy requirements of the 2008 NOAA Fisheries BO for the project and is examining the occurrence of predation associated with the project. The study's field data collection was completed in 2011. Data from the study will be useful in considering permanent barrier design options and operation strategies to minimize predation.

For additional information about SDIP, see Chapter 7, Water Supply Development and Reliability.

Temporary Barriers Project Facilities

The South Delta Temporary Barriers Project is an ongoing project that installs up to four rock barriers in channels located in the southern portion of the Sacramento-San Joaquin Delta near the cities of Tracy and Lathrop in San Joaquin County. The barriers are installed during the irrigation season from April to November at four sites (see Figure 2-3), as follows:

- (1) Head of Old River, in Old River where it splits from the San Joaquin River (rock barrier was not installed in 2011);

- (2) Old River near Tracy, one-half mile east of the Jones Pumping Plant intake and about 8 miles northwest of Tracy;
- (3) Middle River near Victoria Canal, just south of the confluence of Middle River, Trapper Slough, and North Canal; and
- (4) Grant Line Canal, 420 feet east of the Tracy Boulevard Bridge.

The Old River near Tracy, Middle River near Victoria Canal, and Grant Line Canal rock barriers are designed to act as flow control structures to improve water levels and circulation within the South Delta. The Head of Old River barrier is designed to improve migration conditions for Central Valley fall-run Chinook Salmon in the spring and fall. In the spring, the barrier blocks juvenile salmon migratory movements into Old River from the mainstream San Joaquin River. In the fall, the barrier increases the volume of San Joaquin River flow passing downstream through the Port of Stockton and improves dissolved oxygen levels in the San Joaquin River. As a result, it improves the low dissolved oxygen sag that occurs near that area and aids adult salmon upstream migration in the San Joaquin River basin.

In 2011, the three agricultural barriers at Middle River near Victoria Canal, Grant Line Canal, and Old River near Tracy were installed and operated as planned. However, due to a 2008 court order (Wanger Decision) to protect Delta Smelt, installation of the spring Head of Old River physical rock barrier was prohibited. In 2009 and 2010, in lieu of a rock barrier, DWR installed a nonphysical barrier comprised of sound projectors, strobe lights, and a bubble curtain. This combination of technology is referred to as a bioacoustic fish fence. In 2011, DWR planned to install a newly designed bioacoustic fish fence. The fence was constructed and ready to install, but high discharge on the San Joaquin River precluded installation. An acoustic telemetry system was installed and used to track movements of salmon smolts, steelhead, and predatory fish. This was done

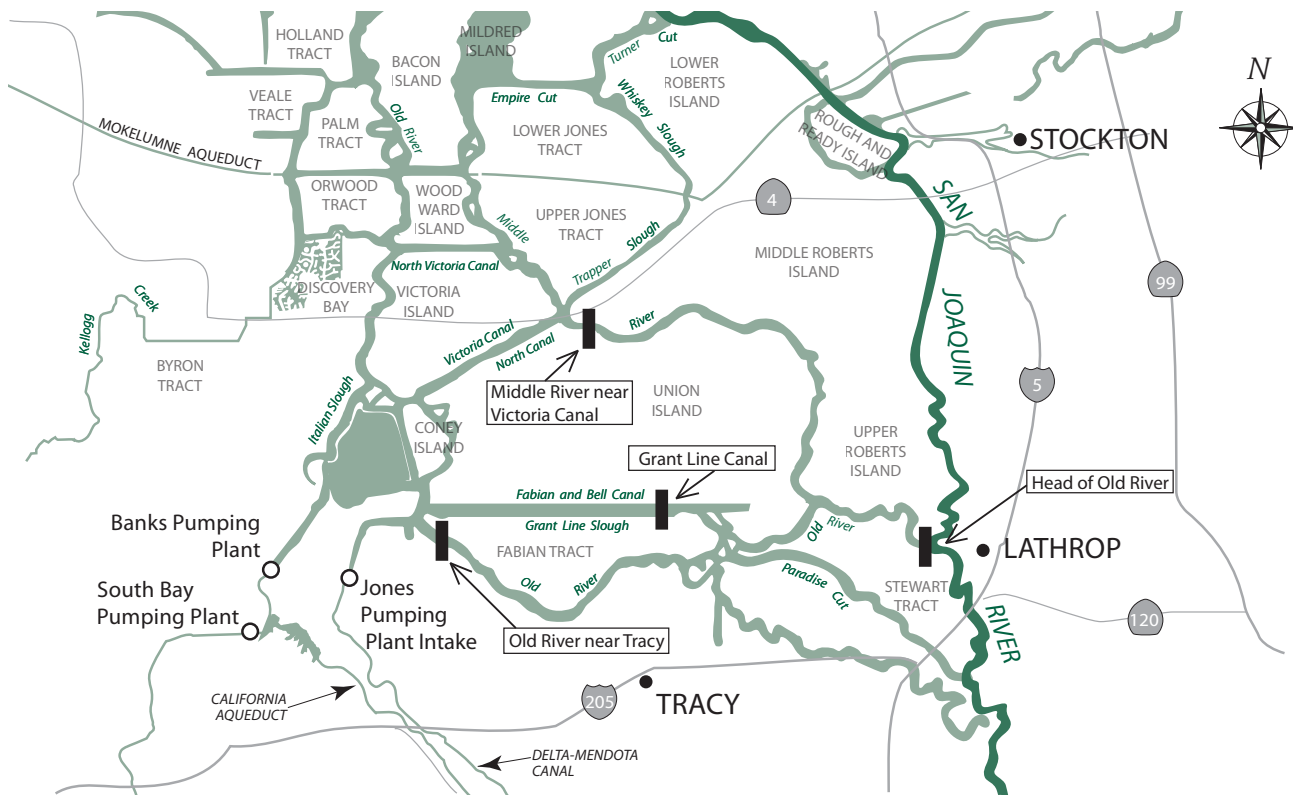


Figure 2-3 Temporary Barrier Locations in the South Delta

in coordination with the larger telemetry studies being conducted by Reclamation and the U.S. Fish and Wildlife Service. Detailed information on route survival and fish behavior in the absence of a barrier was collected and analyzed.

In 2011, DWR continued the fish study data collection at all four barrier sites without the installation of the Head of Old River barrier. The other three agricultural barriers were installed and operated as usual. Data associated with this project will be combined in a single comprehensive report.

The fall Head of Old River barrier was not installed in 2011 because the existing flows and dissolved oxygen levels in the San Joaquin River were sufficient for Chinook Salmon, and it was not requested by the Department of Fish and Wildlife.

More information on the temporary barriers can be found on DWR’s website.

Delta Flood Control

Many important assets in the Sacramento-San Joaquin Delta are protected from flooding by levees. The levees serve many needs. They protect valuable wildlife habitat, farms, homes, urban areas, recreational developments, highways, railroads, natural gas infrastructure, utility lines, a major aqueduct, and other public developments. Some levees are critical to the protection of in-Delta water quality and water quality for approximately 25 million Californians who receive a portion of their water from the Delta. The State Legislature recognized the importance of the Delta and enacted the Delta Flood Protection Act of 1988 (Senate Bill 34 [Water Code Sections 12300 et seq. and 12980 et seq.]). With Senate Bill 34, the Legislature declared that “. . . the Delta is

endowed with many invaluable and unique resources and that these resources are of major statewide significance.”

Since 1988, the Delta Levees Program has provided more than \$310 million in State-appropriated funds. These monies, combined with local cost-share funding, have realized more than \$385 million in levee improvements (through State fiscal year 2010–2011).

In Senate Bill 34, the Legislature declared its intent to appropriate \$12 million annually for the Delta Flood Protection Fund. Of this appropriation, \$6 million is for local assistance under the Delta Levee Maintenance Subventions Program. The remaining \$6 million is for the Delta Levees Special Flood Control Projects, including subsidence studies and monitoring on Bethel, Bradford, Jersey, Sherman, and Twitchell islands; Holland, Hotchkiss, and Webb tracts; and the towns of Thornton and Walnut Grove.

In 1996, Assembly Bill 360 was signed into law expanding the area covered by the Delta Levees Program to include the remainder of the legal Delta and northern Suisun Bay.

Bond appropriations of \$25 million from Proposition 204 (enacted in 1996) and \$30 million from Proposition 13 (enacted in 2000) provided supplemental funding.

In November 2002, Proposition 50 was approved. It provided \$70 million in additional funding to implement the Delta Flood Protection Program as adopted in CALFED, where the program was known as the Levee System Integrity Program.

Proposition 84, approved by voters in November 2006, allocated \$275 million to the Delta for 4 years.

Proposition 1E, also approved by voters in November 2006, added funding for Delta levee improvements.

CALFED Levee Stability Program

The CALFED Bay-Delta Authorization Act (Public Law 108-361, 2004) authorized the Corps to develop action strategies to address urgent levee improvement needs and identify and prioritize potential short-term and long-term levee stability projects in the Delta.

The CALFED Levee Stability Program is the Corps’ short-term strategy to move quickly on high-priority levee reconstruction projects.

The Corps’ long-term strategy for Delta levees will be developed in the Sacramento-San Joaquin Delta Islands and Levees Feasibility Study. The feasibility study will build on recommendations in the State’s Delta Risk Management Strategy, a technical study to assess the risks to the Delta levee system and the associated effects of levee failures.

For additional background information, see Bulletin 132-11.

Delta Flood Emergency Preparedness, Response, and Recovery Program

The Delta Flood Emergency Preparedness, Response, and Recovery Program is a part of the FloodSAFE California Initiative. The FloodSAFE initiative was developed by DWR in response to the passing of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E), which made funding available to enhance disaster preparedness. The program is designed to enhance emergency preparedness and enable DWR to better coordinate with its local partners to respond to and recover from a large-scale Delta flood emergency.

The Flood Operations Branch received an initial draft of the *Delta Flood Emergency Preparedness, Response, and Recovery Plan* in November. The Plan supports established statewide emergency planning documents and procedures and includes prescribed actions for dealing with flood emergencies within the Sacramento-San Joaquin Delta.

For more information, visit DWR's website.

Delta Levees Maintenance Subventions Program

The Delta Levees Maintenance Subventions Program (Subventions Program) is a cost share program that provides technical and financial assistance to local levee-maintaining agencies in the Sacramento-San Joaquin Delta for the maintenance and rehabilitation of Delta levees. The Subventions Program is authorized by California Water Code Sections 12980 through 12995 and is managed by DWR. The Central Valley Flood Protection Board reviews and approves DWR's recommendations and enters into agreements with local agencies to reimburse eligible costs for levee maintenance and rehabilitation.

The Subventions Program provides funding to local levee-maintaining agencies for improving, maintaining, and enhancing nearly 700 miles of project and nonproject levees. Since its inception in 1973, the Subventions Program has provided more than \$160 million of State funding to more than 70 islands in the Sacramento-San Joaquin Delta. In fiscal year 2011–2012, the program reimbursed nearly \$8 million to 67 local agencies for eligible levee maintenance and rehabilitation activities. These activities helped minimize the risk of Delta levee failure which in turn protects the Delta's ecosystem, communities, and agriculture; State and private infrastructure; and the State's water supply.

Delta Special Flood Control Projects Program

The Delta Special Flood Control Projects Program assists the eight western islands, portions of the Suisun Marsh, the towns of Thornton and Walnut Grove, and other locations in the Delta with flood protection and levee stability repairs. The California Water Commission approved a report of initial actions in September 1989, and it approved long-term actions and priorities in May 1990. The long-term actions and priorities serve as a guide for DWR to determine the best use of appropriations to protect these islands. Long-term actions and priorities include the following:

- rehabilitating threatened levees through the beneficial reuse of dredged material;
- verifying elevations in the Delta through the use of global positioning system equipment and light detection and ranging;
- upgrading levees to the standards included in Bulletin 192-82 (Delta Levees Investigation); and
- considering projects to achieve net long-term habitat improvement for fish and wildlife.

While DWR seeks cost sharing for all projects, the actual reimbursement depends on each reclamation district's ability to pay. DWR may provide up to 100 percent of the cost. Districts receiving these funds are required to participate in a habitat improvement program to ensure net long-term habitat enhancement.

Levee restoration projects, habitat projects, and other special projects were conducted on various Delta islands and tracts in 2011.

Reuse of Dredged Material for Delta Levees

As local sources of fill material for levee repair are depleted, new economical

sources must be located. DWR has worked to find more opportunities to reuse clean, dredged materials in the Sacramento-San Joaquin Delta.

As part of this effort, a charter for the multiagency Delta Long-Term Management Strategy (LTMS) for the beneficial reuse of dredged material became effective in February 2007. The LTMS is designed to improve operational efficiency and coordination of collective and individual agency decision-making responsibilities, resulting in approved dredging and dredged material management actions in the Delta. Regular LTMS meetings include representatives from DWR, the Corps, the U.S. Environmental Protection Agency, the Regional Water Quality Control Board (RWQCB), the Ports of Stockton and West Sacramento, and other interested parties. LTMS is evaluating potential beneficial reuse opportunities, particularly from the proposed Sacramento and Stockton Deep Water Ship Channel projects, and has prepared a draft summary of Delta dredged material placement sites and a draft Delta-wide map of existing sediment placement sites.

To facilitate the permitting process for dredging and dredged material placement and reuse, a draft joint permit application for dredging and dredged material placement/reuse has been developed. An interagency agreement between DWR and the RWQCB is underway; a sediment background study is planned for Sherman, Twitchell, and Brannan-Andrus islands; and development of general order waste discharge requirements to help streamline the RWQCB's approval process has also been initiated.

Delta LTMS long-term goals include the following:

- developing a streamlined permitting process for dredging and dredged material reuse;
- developing a consolidated guidance document addressing sampling, tests, protocols, and methods for assessing sediment and dredged material characterization;
- developing a sediment management plan of methodologies for assessing and characterizing sediments and determining appropriate disposal options;
- developing a programmatic biological assessment for sensitive Delta species;
- drafting a programmatic EIR/EIS for the Delta LTMS; and
- identifying and permitting additional sediment placement and beneficial reuse sites in the Delta.

For more information, visit DWR's website.

Subsidence Investigations

Subsidence in the Sacramento-San Joaquin Delta marshlands is widely accepted to be caused by local draining and cultivation projects, which cause the peat soil to break down and compact. The peat soil has oxidized and subsided since the mid-1800s when the land was first drained and levees constructed. The surface of organic soils in the Delta is now between 10 and 29 feet below sea level. The Legislature recognized the problem and, with the initiation of the Delta Flood Protection Act of 1988, DWR began monitoring subsidence and studying its causes and the means for reversing its effects. The West Delta Program has been given the specific task of implementing land-use management techniques to control subsidence and soil erosion on Sherman and Twitchell islands, where the SWP owns approximately 12,500 acres of land.

DWR continued its partnership with USGS for research on the 15-acre Twitchell Wetlands Research Facility, initially funded in 1999 using CALFED Category III funds. Additional research activities performed in 2011 by USGS include assessments of water quality impacts, greenhouse gas release, factors

influencing the formation of methylmercury, and other impacts of tule cultivation in subsided Delta islands.

Because of the success of this wetland site, there have been plans to expand the project in size, creating a farm-scale wetland between 300 and 1,000 acres on Twitchell Island. Further development of a proposed Farm Scale Wetlands Demonstration Project adjacent to the existing Subsidence Reversal Demonstration Project occurred in 2011 to determine the land accretion and carbon sequestration rates associated with wetland farming within the western Delta.

The Mayberry Farms Subsidence Reversal and Carbon Sequestration Project was officially underway when it was flooded in 2011. The Mayberry Farms project created permanently flooded wetlands on a 307-acre parcel on Sherman Island. The completion of construction restored approximately 192 acres of emergent wetlands and enhanced approximately 115 acres of seasonally flooded wetlands. The Mayberry Farms project is a demonstration project that will provide subsidence reversal benefits and develop knowledge that can be used by operators of private wetlands, including “duck clubs,” which manage lands for waterfowl-based recreation. The plan is to maintain permanent water to stimulate the growth and subsequent decomposition of emergent vegetation, which will control and reverse subsidence. The project is anticipated to provide climate benefits by sequestering atmospheric carbon dioxide and provide several research opportunities with greenhouse gas production and sequestration; methylmercury production; and general hydraulic, hydrologic, or water quality projects. One such research project began in 2011 involving the study of water quality and the formation of methylmercury in the wetland. The methylmercury research on Mayberry Farms is a joint effort between West Delta staff and Department of Fish and Wildlife water quality scientists from

the Moss Landing laboratory. The parcel is expected to provide year-round wetland habitat for waterfowl and other wildlife.

In addition to tules, rice is a wetland crop with an existing agricultural market that has the potential to accrete land mass and sequester carbon. The Subsidence Mitigation Rice Cultivation Research project continued to determine whether growing rice reverses subsidence, whether it can be grown without deleterious effects to the environment, and whether rice is economically feasible in the Delta.

In April 2011, 304 acres of rice were planted on Twitchell Island. Research data from 2009–2010 collected by consultants (University of California (UC), Davis and USGS) showed rice production (approximately 304 acres) stopped subsidence and achieved small amounts of accretion, sequestered atmospheric carbon dioxide, and acted as a sink for methylmercury.

Because of the findings from the research, and to potentially make the rice fields more productive and economical for a future lease, a western expansion of the rice fields was constructed in 2011. With the expansion of this project, the additional 281 acres of rice producing fields will further contribute to carbon dioxide sequestering and subsidence reversal on Twitchell Island. Planting is scheduled again for spring 2012, with approximately 585 acres of rice production planned.

Work continued in 2011 on a greenhouse gas protocol, which is a collaborative effort between DWR, the State Water Contractors, the California Air Resources Board, the Delta Conservancy, and several research organizations, including UC Berkeley. The West Delta Program worked with UC Berkeley researchers to construct three towers that measure greenhouse gas fluxes at Mayberry Farms and the corn and rice

fields on Twitchell Island. The towers will collect data that will be analyzed by DWR and used to develop future protocols.

DWR continued to work with the Delta Science Program (formerly the CALFED Science Program) to develop best management practices to control and reverse subsidence and will work with local districts and landowners to implement cost-effective measures.

For current information related to these projects, please visit DWR's website.

Delta Agricultural Water Agencies

In 1974, the Delta Water Agency was replaced by six Delta agricultural water agencies: North Delta Water Agency, South Delta Water Agency, Central Delta Water Agency, Contra Costa County Water Agency, East Contra Costa Irrigation District, and Byron-Bethany Irrigation District. In 1981, North Delta Water Agency and East Contra Costa Irrigation District signed water rights management contracts with DWR. DWR negotiated contracts and requested negotiations with other agencies to provide water level, circulation, and quality needs in certain areas.

South Delta Water Agency Contract

In September 1990, DWR completed negotiations for a long-term agreement with South Delta Water Agency and Reclamation. Under the South Delta Water Agency contract, the parties agreed to proceed with the design, construction, and operation of certain barrier facilities in the South Delta channels. These facilities resolved portions of the lawsuit that South Delta Water Agency filed in 1982 regarding the alleged effects of export pumping by the SWP and CVP on water levels, quality, and circulation in the South Delta.

DWR has installed and operated temporary barrier facilities in the South Delta to improve area conditions, as well as collect data needed to design and operate permanent barrier facilities. Ongoing efforts are being made to improve water levels, circulation, and quality in South Delta channels. These efforts have included modifying and dredging around local diverters' intakes, conducting a series of computer modeling studies, and modifying barrier flap gate operations.

Although DWR received the required environmental permits to raise the Middle River weir by 1 foot, the weir was not raised because of adequate water levels and quality. (Water year 2010–2011 was a wet year.)

Western Delta Municipal Water Users

DWR signed contracts with Contra Costa Water District in 1967 and the City of Antioch in 1968. These contracts compensate Contra Costa and Antioch for purchasing water of usable quality when such water is not available from Mallard Slough and the San Joaquin River.

According to the contract, DWR compensates each agency for the additional costs of purchasing a substitute water supply from the Contra Costa Canal. This water is purchased to replace water supplies of usable quality which are lost due to SWP operations. Credits for the number of days of above-average water supplies of usable quality, from Mallard Slough and the San Joaquin River, accrue to offset the number of below-average days in future years.



Chapter 3

Environmental Programs

California Red-legged Frog, Rana draytonii.

Significant Events in 2011

In 2011, the *Vernalis Adaptive Management Plan* (VAMP) marked its twelfth and final year of formal compliance with State Water Resources Control Board, Water Right Decision 1641. Actions associated with VAMP were implemented between May 1 and May 31, 2011.

Pursuant to the Fish Restoration Program Agreement, the Department of Water Resources (DWR) and the Department of Fish and Wildlife (DFW) began developing a strategy for implementing restoration actions to satisfy DWR's obligations under the biological opinions (BOs) and incidental take permit. A draft was distributed to stakeholders for public review in fall 2011.

The *Climate Change Handbook for Regional Water Planning* was released in December 2011. The handbook provides resources and tools to guide water resource managers and planners as they develop ways to adapt their programs to a changing climate. The handbook was developed cooperatively by the Department of Water Resources (DWR), U.S. Environmental Protection Agency, Resources Legacy Fund, and U.S. Army Corps of Engineers. The handbook is available from DWR's website.

Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.

The Department of Water Resources (DWR) has developed and implemented several programs to avoid, minimize, and/or offset adverse environmental impacts resulting from construction and operation of State Water Project (SWP) facilities.

Operations for Species of Concern

A primary consideration in the operation of the SWP is avoiding, minimizing, and/or offsetting adverse impacts to species of concern, species listed as threatened or endangered by a State or federal agency, or species proposed for listing. The SWP is operated pursuant to biological opinions (BOs) issued under the federal Endangered Species Act (ESA), as well as consistency determinations or incidental take permits issued under the California Endangered Species Act (CESA). A key to avoiding and minimizing adverse impacts to these species is maintaining flexibility in SWP operations. Operational responses can include Delta Cross Channel gate closure, export curtailments, changes in delivery schedules, increased reservoir releases, preferential use of certain facilities, or a combination of these actions.

Additional information can be found in Chapter 7, Water Supply Development and Reliability.

San Joaquin River Activities *Vernalis Adaptive Management Plan*

The *Vernalis Adaptive Management Plan* (VAMP) was initiated in 2000 as part of State Water Resources Control Board, Water Right Decision 1641. VAMP is a large-scale, long-term (12-year), experimental management program designed to protect juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) migrating from the San Joaquin River through the Sacramento-San Joaquin Delta (Delta). The goal of VAMP is to conduct operational changes and associated fisheries

studies to determine if a relationship exists between river flow, Delta exports, and salmon survival throughout the southern Delta. VAMP's study results will be used to determine if changing San Joaquin River flows and Delta exports in the spring can significantly benefit San Joaquin River fall-run Chinook Salmon.

DWR, the Bureau of Reclamation (Reclamation), and the San Joaquin River Group Authority member agencies coordinate SWP and Central Valley Project (CVP) operations to increase flows in the San Joaquin River during the specified VAMP pulse flow period, a 31-day period during the months of April and May, to benefit fall-run Chinook Salmon emigrating from the San Joaquin River Basin. Intensive fisheries sampling is conducted in the lower San Joaquin River during the pulse flow period. VAMP studies coordinate variable export pumping rates with a fish release and tracking study to estimate the relative survival of marked salmon moving through the Delta under VAMP during the pulse flow period. A temporary rock barrier is installed at the Head of Old River to block the movement of juvenile salmon into Old River, allowing them to continue down the main stem of the San Joaquin River.

In 2011, VAMP marked its twelfth and final year of formal compliance with State Water Resources Control Board, Water Right Decision 1641. Actions associated with VAMP were implemented between May 1 and May 31, 2011.

Because San Joaquin River basin flows were driven by flood-control operations during the 2011 VAMP period, the VAMP hydrologic

operation consisted mainly of monitoring the flow conditions during the VAMP period.

The mean daily flow in the San Joaquin River at the Vernalis gauge averaged 12,650 cubic feet per second (cfs) during the VAMP target flow period. The mean daily flow at Vernalis varied between 10,100 cfs and 18,200 cfs during the target flow period.

The combined CVP and SWP Delta export rate target during the VAMP period was 3,000 cfs. The observed exports during this period averaged 3,360 cfs and ranged from 2,420 cfs to 5,160 cfs.

The fish release and tracking study was conducted; however, flows in 2011 were too high to install either a physical or nonphysical barrier at the Head of Old River.

Temporary Barriers

VAMP-participating agencies install temporary barriers in the San Joaquin River to provide an adequate water supply for South Delta water diverters, improve water quality in the Stockton Deep Water Ship Channel, and prevent entrainment of juvenile Chinook Salmon at the South Delta facilities.

Brief background information about the temporary barriers and a map showing their locations can be found in Chapter 2, Delta Resources.

Head of Old River Barrier. The planned spring Head of Old River nonphysical barrier was not installed this season due to high flows in the San Joaquin River as a result of late-season storm activity and associated heavy snowpack. As a result, fish studies at the Head of Old River were restructured to evaluate predatory fish behavior in the absence of a nonphysical barrier. All equipment was removed on June 23, 2011.

The fall Head of Old River barrier was not installed per Department of Fish and Wildlife (DFW) instruction.

For additional information, see Chapter 2, Delta Resources.

Agricultural Barriers—Old River near Tracy, Middle River, and Grant Line Canal.

Installation of the Old River near Tracy barrier started on May 27, 2011, and closure was achieved June 10, 2011.

Middle River barrier construction started on June 1, 2011, and the barrier was closed June 6, 2011. All culvert flap gates at both barriers were tied open.

In compliance with the temporary barriers permit and agreement condition, the Middle River and Old River near Tracy barriers were notched on September 15, 2011. A 10-foot notch was created at each barrier to allow salmon passage. All culvert flap gates at the Old River near Tracy and Middle River barriers were untied on August 23; the barriers were breached on October 11, 2011.

Installation of the Grant Line Canal barrier started on June 10, 2011, and included reconstruction of the south abutment and culvert structures. Work was completed on June 24, 2011.

Closure of the Grant Line Canal barrier was nearly complete on July 14; however, high river flows caused erosion and damaged the existing flashboard structure near the south levee. To relieve pressure on the barrier and prevent scour, larger rocks were placed at the southern barrier abutment and the weir was lowered; this work was completed August 3, 2011.

The installation of the six 48-inch culverts was completed with the placement of the catwalk. All the flap gates were secured in the tied-open position.

No notch was required at the Grant Line Canal barrier this season due to high river flow.

As of August 12, 2011, all culvert flap gates at Old River near Tracy, Middle River, and Grant Line Canal remained tied open.

Removal of the barriers at Old River near Tracy and Middle River was completed on October 31 and October 18, respectively.

The Grant Line Canal barrier removal began the week of October 17, 2011, and was completed November 4. Due to high San Joaquin river flows, the reinstallation of the damaged flashboard structure at the barrier was postponed until the following spring.

San Joaquin River Restoration Program

In 2006, the San Joaquin River Restoration Program (SJRRP) was established to implement the court settlement to restore 153 miles of the San Joaquin River from Friant Dam to the confluence of the Merced River. The agencies responsible for the implementation of SJRRP include Reclamation, the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), DWR, and DFW. On March 30, 2009, the San Joaquin River Restoration Settlement Act was signed into law, authorizing and funding the SJRRP.

The SJRRP continued to make progress on program activities in 2011. The draft program environmental impact statement (EIS)/environmental impact report (EIR) was released for public review on April 22, 2011, with the comment period ending June 21, 2011. After a number of requests to extend the comment period, it was extended for 90 days with a new closing date of September 21, 2011. Public hearings were held May 24–26, 2011, in Visalia, Fresno, Los Banos, and Sacramento.

The second year of interim flows was completed and included the recapture of more than 29,600 acre-feet of flows that were recirculated to Friant Division long-term contractors. Planning, design,

and environmental compliance activities continued in support of the Mendota Pool Bypass and Reach 2B Channel Improvements Project and the Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project.

In September, the SJRRP was selected as one of 17 recipients for the 2011 Partners in Conservation Award from the U.S. Department of the Interior for its extensive collaborative efforts.

More information is available on SJRRP's website.

Lower Yuba River Accord

The Lower Yuba River Accord's (Yuba Accord) purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Yuba Accord provides revenues for local flood control and water supply projects, water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries, and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

In 2011, excess conditions in the Delta prevented accounting of Yuba County Water Agency releases as transfer water for the entire summer transfer season. Yuba County Water Agency must repay Component 1 water in a future year that is not a dry or critical year, will not reduce Component 2 or 3 deliveries, and is agreeable in schedule to the parties. The effects of the BOs on allocations and transfer timing make that repayment more difficult than was envisioned when the Water Purchase Agreement was negotiated.

For more information about the Yuba Accord, see Chapter 9, Water Contracts and Deliveries.

Oroville Facilities

Existing Federal Energy Regulatory Commission License Activities for 2011

Invasive Plant Management

During 2011, DWR worked with DFW, Butte County Resource Conservation District, the California Conservation Corps, and the Butte County Agricultural Commissioner to control and remove red sesbania (*Sesbania punicea*) in Butte County. A two-year grant was acquired in 2010 by the Butte County Weed Management Area. The grant funding supported treatment of a good portion of red sesbania along the upper reach of the Feather River and within the Oroville Wildlife Area. DWR has been annually removing all red sesbania along the Thermalito Power Canal, Thermalito Forebay, and Thermalito Diversion Pool. This ongoing maintenance was started by the Department of Parks and Recreation (California State Parks) in 2007. DWR took over in 2008 and will continue until red sesbania is eradicated. The Thermalito Power Canal, Forebay, and Diversion Pool are the upstream extent of the red sesbania population on the Feather River.

Also in 2011, DWR partnered with the Butte County Agricultural Commissioner to treat skeleton weed (*Chondrilla juncea*) near McCabe Creek at Lake Oroville. DWR provided California Conservation Corps labor to clear access for Butte County to treat the skeleton weed.

Lake Oroville Fisheries

In January 2011, DWR purchased 320,000 Coho Salmon eggs from Aquaseed Corporation in Washington (80,000 experimental triploid [sterilized] eggs and 240,000 diploid [standard] eggs). The eggs were hatched at the Feather River Fish Hatchery (FRFH). A total of 229,400 Coho Salmon were planted in the lake (212,400 mixed-sex fish and 17,000 sterile fish).

During 2011, DFW stocked 5,000 steelhead in the Thermalito Afterbay due to a surplus egg supply at the FRFH.

Habitat improvement continued in 2011 in the fluctuation zone of the lake. Approximately 1,800 Christmas trees were recycled with the help of the Boy Scouts and the California Conservation Corps. The trees were constructed into structures for juvenile fish habitat in the Miners Ranch saddle dam area.

Feather River Fish Hatchery

A total of 10,544,230 juvenile fall-run Chinook Salmon were released into the Delta, the Sacramento River, and the San Francisco and San Pablo bays in 2011.

Also in 2011, a total of 2,227,846 juvenile spring-run Chinook Salmon were released: 1,156,133 in San Pablo Bay and 1,181,710 in the Feather River. Additionally, 33,800 steelhead were planted in the Feather River at Boyd's Pump.

Oroville Wildlife Area

Construction activities for two new wetland ponds in the Oroville Wildlife Area began in August 2010, and were completed in November 2011. Approximately 250,000 cubic yards of material were removed. The wetland ponds will convert a 20-acre area of low-quality, disturbed, upland habitat (flat, open area, with sand/cobble soils and heavily vegetated with weedy annuals and other nonnative plants) into 10 acres of emergent wetland and 10 acres of riparian habitat. Revegetation efforts and nonnative plant species management are anticipated to begin in spring 2012. These wetland ponds are being created as mitigation required by the 1995 federal Clean Water Act Section 404 permit for two waterfowl brood ponds that were constructed at the Thermalito Afterbay. The brood ponds were a requirement of the revised recreation plan that was part of the

Federal Energy Regulatory Commission's September 22, 1994, order.

Lake Oroville Elevation

The 2011 low point for the Lake Oroville reservoir elevation was reached on January 1 at 800.3 feet, and the annual high point of 900.1 feet was reached on June 25. The full pool elevation of Lake Oroville is approximately 900 feet.

Federal Energy Regulatory Commission Relicensing Activities

Various conservation measures for the species identified in the USFWS 2007 BO for the Oroville Facilities relicensing project continued to be implemented on SWP lands. Monitoring associated with these measures includes an annual vernal pool survey (645 mapped vernal pools and/or features); protective measures for elderberry shrubs (*Sambucus* species, host plant for the valley elderberry longhorn beetle [*Desmocerus californicus dimorphus*]); and annual monitoring of nesting Bald Eagles (*Haliaeetus leucocephalus*) in the area (four currently active nests). In addition, habitat management activities within the Oroville Wildlife Area are coordinated through DFW staff. These activities include providing nest and forage habitat for waterfowl and upland bird species, monitoring and maintaining Thermalito Afterbay brood pond water surface elevations, and protecting and conserving Giant Garter Snake (*Thamnophis gigas*) habitat. An annual compliance report for 2011 was compiled by DWR and submitted to USFWS.

For more information about Oroville Facilities relicensing, see Chapter 10, Power Resources.

Invasive Species

Quagga and Zebra Mussel Monitoring and Assessment

The quagga mussel, *Dreissena rostriformis bugensis*, and the zebra mussel, *D. polymorpha*, are invasive freshwater mussels that pose a significant threat to the SWP. Both species attach to hard substrates, including other mussels, with strong byssal threads, forming dense colonies and causing significant biofouling impacts to raw water infrastructure by clogging small diameter piping and filters and encrusting trash racks and fish screens.

In early 2007, the quagga mussel was detected in the lower Colorado River and spread throughout connected water diversion systems (see Bulletin 132-08). The following year, the zebra mussel was detected in San Justo Reservoir in San Benito County, adding to the existing threat. In response, DWR formed the Aquatic Nuisance Species (ANS) Program within the Division of Operations and Maintenance (O&M). The program includes applied studies, early detection monitoring, vector management, rapid response planning, long-term mussel management, and public outreach.

Applied Studies

Assessment of Habitat Suitability. DWR's consultant, RNT Consulting Inc. (see Bulletin 132-11), examined the suitability of the SWP to support long-term populations of quagga and zebra mussels (dreissenids) if unintentionally introduced. Ten years of calcium and pH data were analyzed from 23 SWP water quality stations. Calcium and pH are essential in shell formation and survival of dreissenid mussels. Based on the results, locations in the SWP were classified into one of 3 groups: unable to support, potentially able to support, or able to support long-term populations of dreissenid mussels. Understanding where dreissenid mussels may survive in the SWP will be

used to prioritize management efforts. The report, *Examination of Calcium and pH as Predictors of Dreissenid Mussel Survival in the California State Water Project*, is available on DWR's website.

To verify the determination, RNT Consulting Inc. tested mussel survival in SWP waters with different levels of calcium. During July through October 2011, water was periodically trucked from three locations to holding tanks at San Justo Reservoir. The locations were the Sacramento River at Hood, Clifton Court Forebay, and O'Neill Forebay Outlet/Check 13, representing low to moderate suitability waters (see Figure 3-1). Water from San Justo Reservoir served as the control. Mussels were held in each water type for 12.5 weeks and were examined for shell condition, weight loss, and mortality. During the fourth week of the study, calcium levels increased at all locations due to lowered reservoir releases, thus improving the suitability characteristics of the water and compromising the results of the study. Study results are anticipated to be available in 2012.

Development of Control Methods.

RNT Consulting Inc. conducted two studies to evaluate low pH as a potential control tool for mussels. Low pH is known to inhibit calcium uptake resulting in impaired veliger (the free floating larval stage) development, degradation of adult mussel shells, and increased mortality. Results of the first pH study showed that the settlement of veligers was inhibited with decreasing pH. At a pH of 7.0, the lowest pH level examined, veliger settlement was about 90 percent lower compared to settlement in the control group. The second study tested the effect of very low pH on adult mussel survival. Results showed 100 percent mortality at pH 3.0, 70 percent mortality at pH 2.0, and 50 percent mortality at pH 4.0.

Early Detection Monitoring. DWR routinely monitors the California Aqueduct, SWP reservoirs, and the Sacramento-San Joaquin

Delta for the presence of quagga and zebra mussels. DWR uses three different methods to monitor for mussels: zooplankton tows (with DNA analysis) for veligers; settlement plates (see Bulletin 132-10); and bioboxes for adults (attached/settled stage).

In 2011, DWR and two collaborating water agencies, Santa Clara Valley Water District and The Metropolitan Water District of Southern California, collected veliger samples at 16 locations (see Bulletin 132-10). In addition, DWR staff are trained in quagga and zebra mussel identification, and are instructed to look for mussels during regular field work and during routine facility maintenance activities. No mussels were detected in the SWP, the Delta, or other SWP source water during 2011.

Prevention and Response Planning

To protect and prepare the SWP against mussels, ANS Program staff developed several planning documents to guide actions and identify vulnerabilities. The *Quagga and Zebra Mussel Vector Management Plan for the State Water Project* identifies potential mussel points-of-entry and vectors, and outlines mechanisms to reduce the risk of introduction. The two primary vectors of mussels are downstream transport of planktonic veligers in natural and constructed waterways and overland transport of veligers and attached adults on watercraft. A critical component of the vector management plan is reducing the risk posed by watercraft. To accomplish this, DWR contracted with the California State Parks and the Los Angeles County Department of Parks and Recreation (LA County Parks) to implement vessel inspection and outreach programs at SWP reservoirs determined to be at moderate- to high-risk for quagga/ zebra mussel infestation (located in Zones 2 and 3) that were not already covered by an existing inspection program. These included San Luis State Recreation Area (San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir) and Pyramid and Castaic

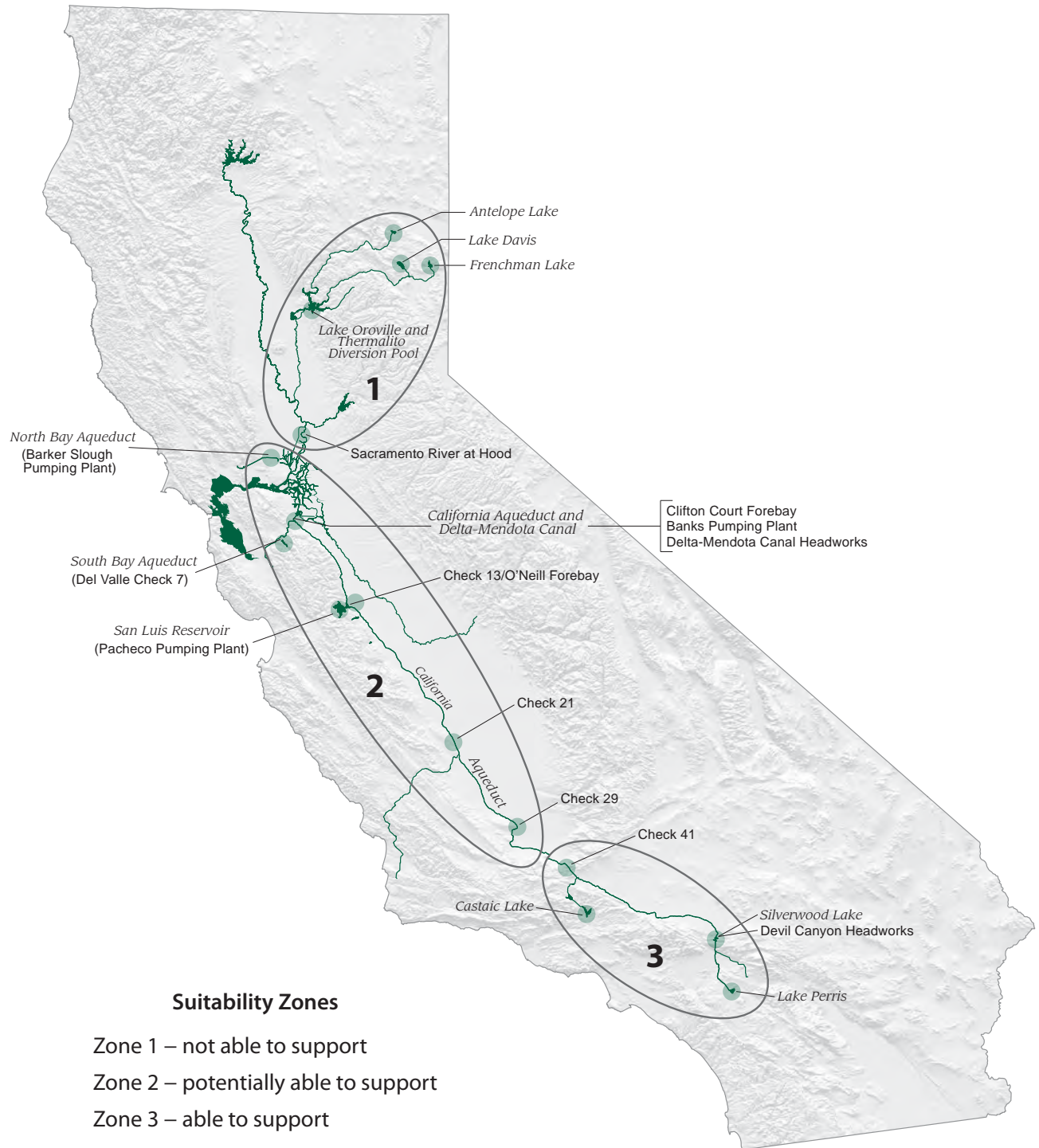


Figure 3-1 Quagga/Zebra Mussel Habitat Suitability in the SWP based on Calcium and pH

lakes. The San Luis State Recreation Area program is operated by California State Parks and was fully implemented in October 2011. The program at Pyramid and Castaic lakes is operated by LA County Parks and was phased in from July to November with full implementation in December 2011. The contracts will continue for 3-year terms.

In the event mussels are detected in the SWP, the *Quagga and Zebra Mussel Rapid Response Plan for the State Water Project* outlines a course of action to confirm the sighting, delineate the population, implement containment and eradication measures, and notify State and federal partner agencies, the SWP water contractors, and any potentially impacted entities.

With uncontrolled watercraft access to and from infested bodies of water, such as the Colorado River, the SWP and the Delta remain vulnerable to mussel infestation. Therefore, DWR is preparing a long-term mussel management plan that identifies facility vulnerabilities and outlines both short-term and long-term options to prevent or mitigate mussel biofouling impacts for all at-risk SWP facilities. The short-term control strategies are those that can be implemented within a few weeks to a few months time and may be temporary in nature, such as shutdowns for power washing and shell removal. The long-term control strategies have longer implementation times (6 months to multiple years) and are permanent in nature (alterations to infrastructure).

RNT Consulting Inc. is assisting DWR with plan preparation. The first phase of the project focused on Southern Field Division facilities, as RNT Consulting Inc. determined that all facilities located downstream of Check 41 are at the highest risk of mussel establishment. RNT Consulting Inc. and DWR ANS Program staff conducted facility site visits, focusing on raw water infrastructure, and determined the areas vulnerable to mussel biofouling. The report is scheduled

for completion in 2012. Similar reports will be prepared for the Delta, San Luis, and San Joaquin field divisions.

The Bay Delta Conservation Plan

In 2011, State and federal agencies continued collaboration and analysis toward drafting the Bay Delta Conservation Plan (BDCP) and the corresponding EIR/EIS documents and agreed to release preliminary drafts of key BDCP-related documents to the public before the formal public review scheduled for 2012. Other highlights of this process for 2011 included refinements to habitat conservation measures proposed by the BDCP, developing alternatives for water conveyance facilities, creating comprehensive biological goals and objectives for covered fish species, and scientific review of the BDCP effects analysis draft.

Refinements to BDCP Conservation Measures

The Yolo Bypass Fishery Enhancement Planning Team significantly advanced development of the Yolo Bypass Fishery Enhancement conservation measure in 2011. Several objectives were developed to help salmon and other fish species. Some of the actions in the newly developed conservation measure include improving the timing, frequency, and duration of flows in the Yolo Bypass, adding fish ladders, making flood control structures more fish friendly, and realigning the mouth of Putah Creek.

The South Delta Habitat Working Group examined several approaches to fish migration habitat and flood management improvement corridors in 2011, identifying specific flood control and habitat projects with the highest potential benefits. Based on these findings, potential floodplain habitat was identified as compatible with flood management objectives. Work is ongoing to quantify flood benefits and risk transfer, and

to identify positive and negative ecological effects corresponding with these projects.

Range of Alternatives

In 2011, a range of alternatives for water conveyance facilities in the BDCP were developed. The alternatives differ primarily in the location, design, size, and operation of water conveyance facilities, as well as habitat restoration options.

Biological Goals Developed

The Biological Goals and Objectives Working Group developed comprehensive goals and objectives for fish species including Chinook Salmon, Delta Smelt, Longfin Smelt, Pacific and River Lamprey, Sacramento Splittail, White Sturgeon, and Green Sturgeon in 2011. These include scientific data, habitat restoration best management practices, and life history rationale supporting each goal and objective. Also included is an overview of how the conservation strategy, if implemented, will help attain each goal and objective; and, when applicable, specific numeric goals for each life stage of each species.

Effects Analysis Reviewed

Because the BDCP will alter the physical and biological environment of the Delta, it includes an effects analysis to describe predicted effects on biological performance, particularly with regard to species' population levels. It is a systematic, scientific look at both potential impacts and potential benefits from conservation actions. In 2011, an independent science review panel, convened by the Delta Stewardship Council, conducted Phase I of their assessment of the draft Effects Analysis.

More information is available on the Delta Stewardship Council's website.

BDCP EIR/EIS

A combined EIR/EIS is currently underway, which will fulfill requirements under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). DWR is the State lead agency and Reclamation, USFWS, and NOAA Fisheries are the federal co-lead agencies. Certain chapters of the EIR/EIS were released to federal and State agencies for their review in late 2011. This joint document reviews the environmental effects of the proposed BDCP and a reasonable range of alternatives, including a "no action" alternative. This evaluation will help determine the ultimate preferred alternative and final plan. The lead agencies will continue evaluation of options that include a pipeline/tunnel as well as options to restore up to 100,000 acres of tidal habitat. These options will undergo screening and analysis for comparison. The EIR/EIS will evaluate the potential impacts of the BDCP including impacts to local communities, cultural resources, and the physical and biological environment.

Environmental Surveys

DWR continued conducting field surveys as part of an ongoing effort, begun in 2009, to collect environmental data. These field surveys included botanical as well as wildlife surveys. An environmental document report was prepared summarizing survey work for the 2011 survey season.

Geotechnical Monitoring

DWR's geotechnical monitoring continued in 2011. Specifically, DWR conducted geotechnical borings on properties owned by DWR and on properties whose owners expressed permission to enter in the summer and fall of 2011 to obtain information associated with the BDCP and preliminary engineering studies for the proposed conveyance facilities.

Biological Opinions Issued on CVP/SWP Operations

NOAA Fisheries and USFWS have issued BOs on CVP and SWP operations that include reasonable and prudent alternatives (RPAs) to avoid jeopardy of federally listed species. Both BOs have been remanded by federal court, and in December 2011, USFWS was informed of Reclamation's intent to initiate a combined NEPA process with USFWS and NOAA Fisheries to update the BOs, evaluate the RPAs, and answer specific questions asked by the court.

USFWS Biological Opinion

The 2008 USFWS BO was remanded based on federal court findings that although fish entrainment at the pumping facilities will adversely affect Delta Smelt, the science supporting flow prescriptions in the BO was questioned, and the economic and technical feasibility of the RPAs was not considered. The court set a deadline for development of a new Delta Smelt BO, RPAs, and NEPA review by Reclamation to be completed by December 1, 2013.

A February 2011 settlement agreement bridged an agreement for interim operations of the SWP and CVP through June 30, 2011,

Endangered Species and Biological Opinions

An endangered species is one in danger of extinction in all or a significant portion of its range; a threatened species is one likely to become endangered. The Endangered Species Act (ESA) and the California Endangered Species Act (CESA) are designed to protect threatened and endangered species by ensuring federal and State agencies adopt measures to protect the species during the design, construction, and operation of projects, or for other forms of agency action, and prohibit the unauthorized take of endangered species. Biological opinions and incidental take permits are issued to protect ESA- and CESA-listed species.

ESA Section 7 requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or modify their critical habitat, otherwise formal consultation is required. Federal agencies must consult with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (the wildlife agencies). As part of the consultation process, the wildlife agency issues a biological opinion which states the agency's determination of whether the action is likely to jeopardize a species or adversely modify critical habitat. If the wildlife agency determines an action will jeopardize or adversely modify, it will suggest reasonable and prudent alternatives that the "action agency" may take to avoid the likely jeopardy or adverse modification (Title 16, United States Code Sections 1531–1544 [1973]).

CESA is substantially similar to ESA in all aspects (California Fish and Game Code Sections 2050–2098 [1984]). Under CESA, an incidental take permit issued by the Department of Fish and Wildlife can allow for the take of State-listed species if specific criteria are met, including measures to minimize and mitigate the impacts of authorized take (California Code of Regulations, Title 14, Sections 783.0–783.8).

to limit Delta Smelt entrainment. The interim remedy set a 14-day average for Old River and Middle River flow as a range between -1,250 cfs and -6,100 cfs. The agreement called for an enhanced coordination and transparency process for the Smelt Working Group (SWG), a team of interagency experts on Delta Smelt and Longfin Smelt biology. The SWG was to determine optimal Old River and Middle River flows within the -1,250 cfs to -6,100 cfs range. Their determination would be based upon best available science, including real-time data of overall Delta Smelt distribution, turbidity, salvage, incidental take, temperature, and other relevant physical and biological factors.

In September 2011, the federal court issued an injunction against the full implementation of the RPA Component 3, Action 4 (the “Fall X2 Action”). The RPA pertains to flow levels during fall months that locate the low salinity zone downstream of the Sacramento River confluence where habitat conditions are more favorable. Even with the injunction, flow conditions in 2011 resulted in the fall X2 location being very close to the RPA standard. During this time, the Interagency Ecological Program (IEP) commissioned studies to investigate the effects of fall habitat on the Delta Smelt population.

NOAA Fisheries Biological Opinion

In April 2011, NOAA Fisheries amended the 2009 BO RPAs based on the recommendations of a 2010 independent science review hosted by the Delta Stewardship Council. Updates to the RPAs included improvements to real-time operations and data collection, as well as clarification of specific actions.

In July 2011, a subcontractor with Ocean Associates, Inc., Kier Associates, submitted the final report titled, “An Alternative Technique to Quantify the Incidental Take of Listed Anadromous Fishes at the Federal and State Water Export Facilities in the San Francisco Bay-Delta Estuary.” Reclamation

and DWR set forth a plan in December 2011 to evaluate the alternative technique presented in the report and planned to present a recommendation on the best technique to quantify incidental take of listed anadromous fish species to the independent science review for consideration and refinement.

In September 2011, a federal court upheld the jeopardy conclusion of the 2009 NOAA Fisheries BO, but found that RPAs were not adequately justified or supported by the record. The court directed a remand of the BO. In December 2011, the court ordered that a new BO be finalized by February 2016.

Delta Operations for Delta Smelt and Longfin Smelt

The SWG generally meets from December through June to assess the risk to Delta Smelt and Longfin Smelt from CVP and SWP export facilities. Based on near real-time technical information, such as fish distribution and salvage and physical water conditions, the SWG makes recommendations on export operations with the goal of reducing entrainment of the two species.

Recommendations are based on guidelines outlined in the 2008 USFWS BO and the 2009 DFW Longfin Smelt incidental take permit (see Bulletin 132-11).

During the 2010–2011 water year, strong Delta outflow resulted in more positive flow conditions in the Old River and Middle River channels, posing a low risk for Delta Smelt and Longfin Smelt entrainment. The SWG made no recommendations to modify water project operations.

Neither Delta Smelt nor Longfin Smelt were salvaged at the SWP facility in 2011. At the CVP facility, 51 Delta Smelt and 4 Longfin Smelt were salvaged. These were extremely low values, equaling or surpassing the lowest observed since 1981.

Fish Restoration Program

Pursuant to the Fish Restoration Program Agreement, DWR and DFW began developing a strategy for implementing restoration actions to satisfy DWR’s obligations under the BOs and incidental take permit (see Bulletin 132-11). The implementation strategy is being developed in coordination with USFWS, NOAA Fisheries, and Reclamation, and a draft was distributed to stakeholders for public review in fall 2011. The purpose of this implementation strategy is to describe the process by which DWR and DFW will implement the Fish Restoration Program (FRP) and develop an implementation schedule that will identify restoration actions, estimated costs, targeted acreage, and a timeline for the program. The FRP implementation strategy is expected to be finalized in 2012.

The Fish Restoration Program Agreement Amendment 1, signed on November 15, 2010, clarified details regarding funding for the Battle Creek Restoration Project, one of the proposed actions in the agreement. In December 2010, DWR received confirmation from NOAA Fisheries that the transfer of funds to the Battle Creek Restoration Project would fully satisfy DWR’s obligation under BO Action 1.2.6 (restore Battle Creek for winter- and spring-run Chinook Salmon and Central Valley steelhead). The first \$5.3 million was provided to DFW in June 2011.

Also in 2011, the FRP put out a request for proposals to hire a consulting company to aid in restoration modeling, design, and permitting work. Initial efforts in 2011 focused on habitat restoration of Prospect Island, a property acquired by DWR in 2010. Tasks early in the restoration planning and design process have begun, such as identifying data gaps and working on a stakeholder outreach plan.

The FRP continues to try to find a mechanism to establish a plan for Prospect Island property management, maintenance, and ongoing and emergency levee maintenance. Attempts to reactivate Reclamation District 1667 have not progressed due to numerous issues. The FRP continues to work with other units within DWR to have the levees mowed and inspected.

Decisions on Endangered Species

Table 3-1 lists fish species of concern found in the Delta. No status decisions were made in 2011.

Longfin Smelt

On February 2, 2011, the USFWS agreed to conduct a rangewide status review of Longfin Smelt, and to consider whether any population of Longfin smelt qualifies as a distinct population segment. The publication of the 12-month finding is expected in 2012.

Table 3-1 Special Status Delta Fish Species

Common Name	Scientific Name	ESA (date listed)	CESA (date listed)
Delta Smelt	<i>Hypomesus transpacificus</i>	threatened (4/5/1993)	endangered (1/20/2010)
Longfin Smelt	<i>Spirinchus thaleichthys</i>	none	threatened (4/9/2010)
Chinook Salmon (winter-run)	<i>Oncorhynchus tshawytscha</i>	endangered (2/3/1994)	endangered (9/22/1989)
Chinook Salmon (spring-run)	<i>Oncorhynchus tshawytscha</i>	threatened (11/15/1999)	threatened (2/5/1999)
Chinook Salmon (fall/late fall-run) steelhead (Central Valley DPS)	<i>Oncorhynchus tshawytscha</i>	species of concern (4/15/2004)	none
	<i>Oncorhynchus mykiss</i>	threatened (5/18/1998)	none
Green Sturgeon (Southern DPS)	<i>Acipenser medirostris</i>	threatened (6/6/2006)	none

ESA = federal Endangered Species Act; CESA = California Endangered Species Act; DPS = distinct population segment

Trends in Fish Abundance

Abundance indices for Longfin Smelt and Delta Smelt are based on DFW fall midwater trawl sampling conducted every year from September through December. Index calculations are based on average catch per trawl for 100 core index stations, which are partitioned into 14 geographic areas. The average monthly catch per tow in each area is multiplied by a weighting factor that is based on the estimated volume of water in each area. The resulting values are then summed over all areas and months to obtain the annual index. This fall abundance index provides one of the best indicators of the status of the adult Longfin and Delta Smelt populations.

The abundance index for Longfin Smelt, from 1967 through 2011, is shown on Figure 3-2.

Figure 3-3 shows the abundance index for Delta Smelt, from 1967 through 2011. The index rose significantly in 2011, to a value nearly 12 times higher than in 2010. This was the highest observed index for Delta Smelt in a decade.

For more about the declining abundance of Delta Smelt and other pelagic fish species in the Delta, see the Pelagic Organism Decline section in this chapter.

Figure 3-4 shows estimates of returning adult winter-run Chinook Salmon from 1970 through 2011. These estimates, referred to as escapement estimates, are the number of adults that escape mortality and return to spawn. The Sacramento River winter-run Chinook Salmon escapement estimates are generated using data from the DFW carcass survey. DFW has been using the carcass survey data to generate escapement estimates since 2001, prior to which Red

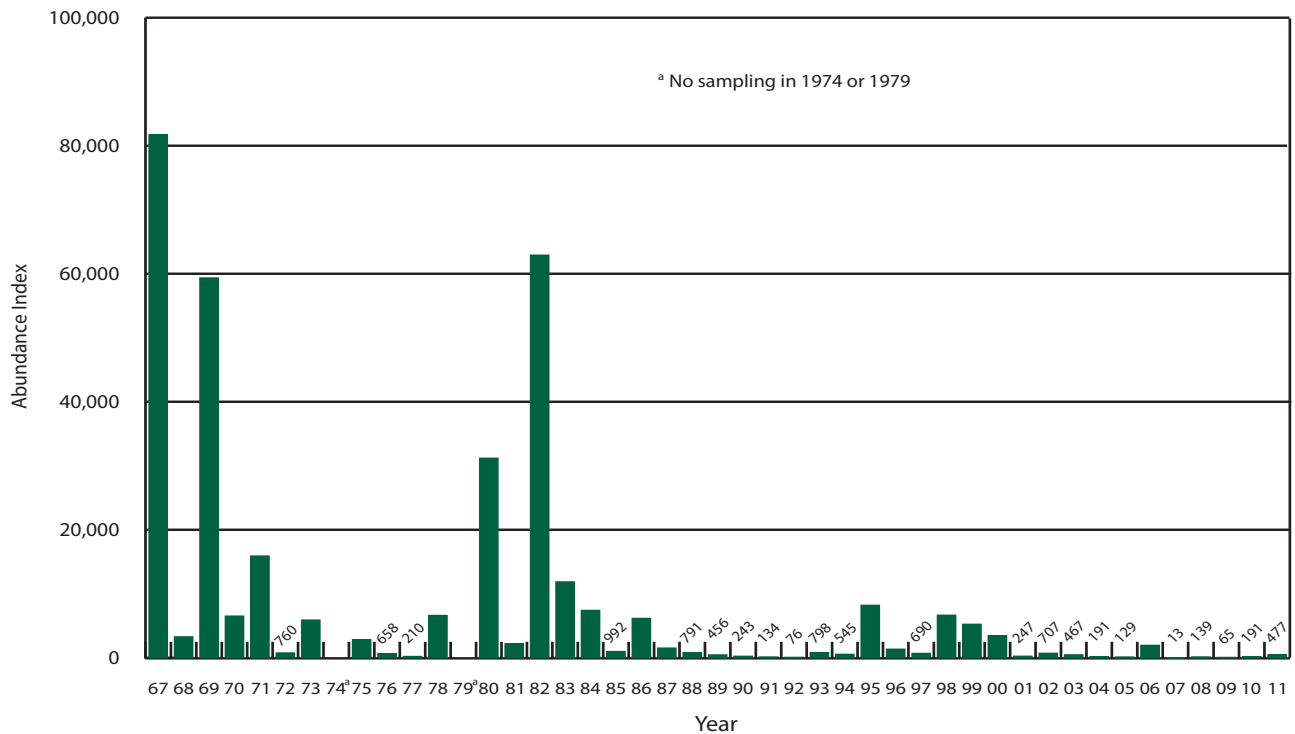


Figure 3-2 Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2011

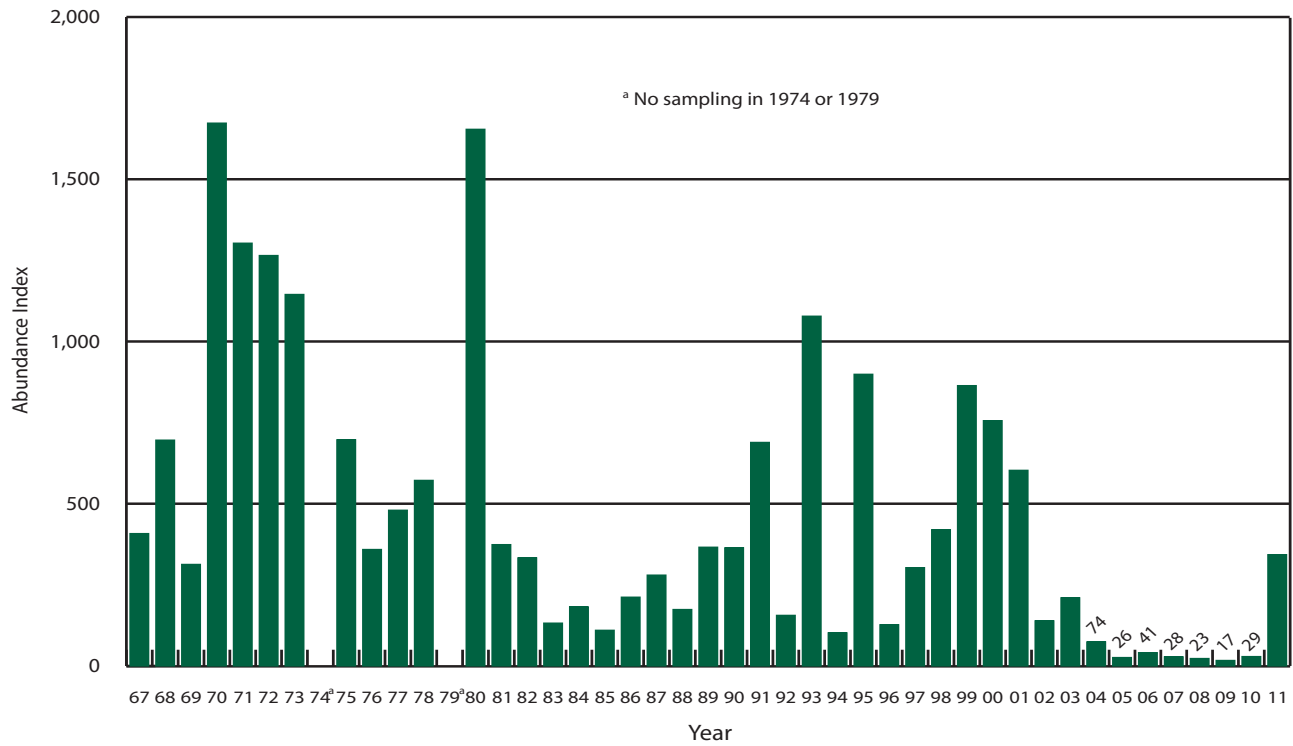


Figure 3-3 Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2011

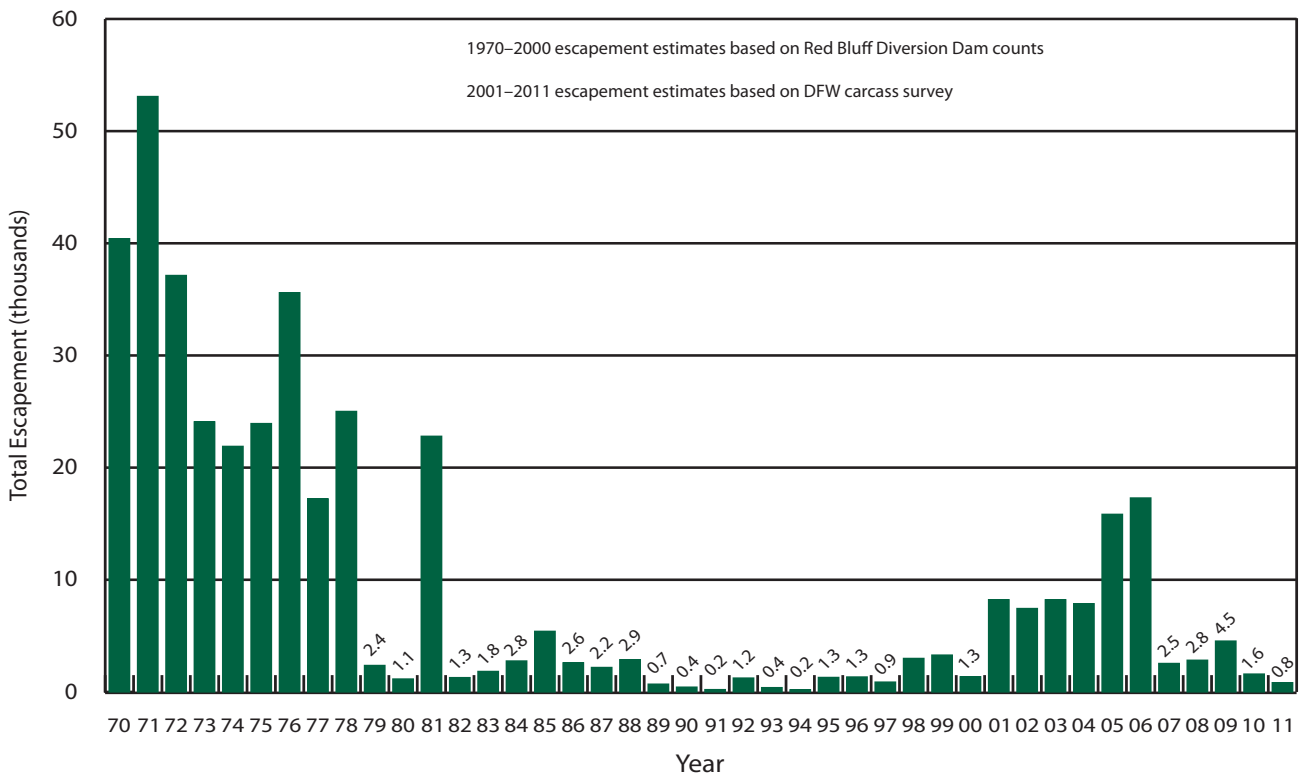


Figure 3-4 Estimated Total Adult Winter-run Chinook Salmon Escapement, 1970–2011

Bluff Diversion Dam counts were used. The estimated winter-run Chinook Salmon escapement for 2011 was 827, which was a 48 percent decrease from 2009 and the lowest estimate since 2000.

Figure 3-5 shows estimates of returning adult spring-run Chinook Salmon from 1985 through 2011. Individual estimates are shown for FRFH and the principal spring-run spawning streams: Mill Creek, Deer Creek, and Butte Creek. The escapement estimates are shown separately for each stream, because the Feather River estimate is based on returns to the FRFH, where the genetic integrity of spring-run Chinook Salmon is uncertain. The estimated escapement for 2011 was 1,969 for FRFH and 2,767 for the other streams combined. The 2011 FRFH escapement was approximately 121 percent of the 2008 parent stock escapement estimate. The escapement of naturally spawned fish for Mill, Deer, and Butte

creeks was about 62 percent of the 2008 parent stock.

Due to the lack of comprehensive monitoring programs, there are no reliable escapement estimates for wild Central Valley steelhead.

Pelagic Organism Decline in the Upper San Francisco Estuary

By the early 2000s, long-term monitoring by the IEP revealed marked declines in numerous pelagic (open water) fish species in the upper San Francisco Estuary (the Delta and Suisun Bay). This decline has collectively become known as pelagic organism decline (POD).

Abundance indices calculated from several IEP monitoring programs for pelagic fish of the upper estuary increased in 2011

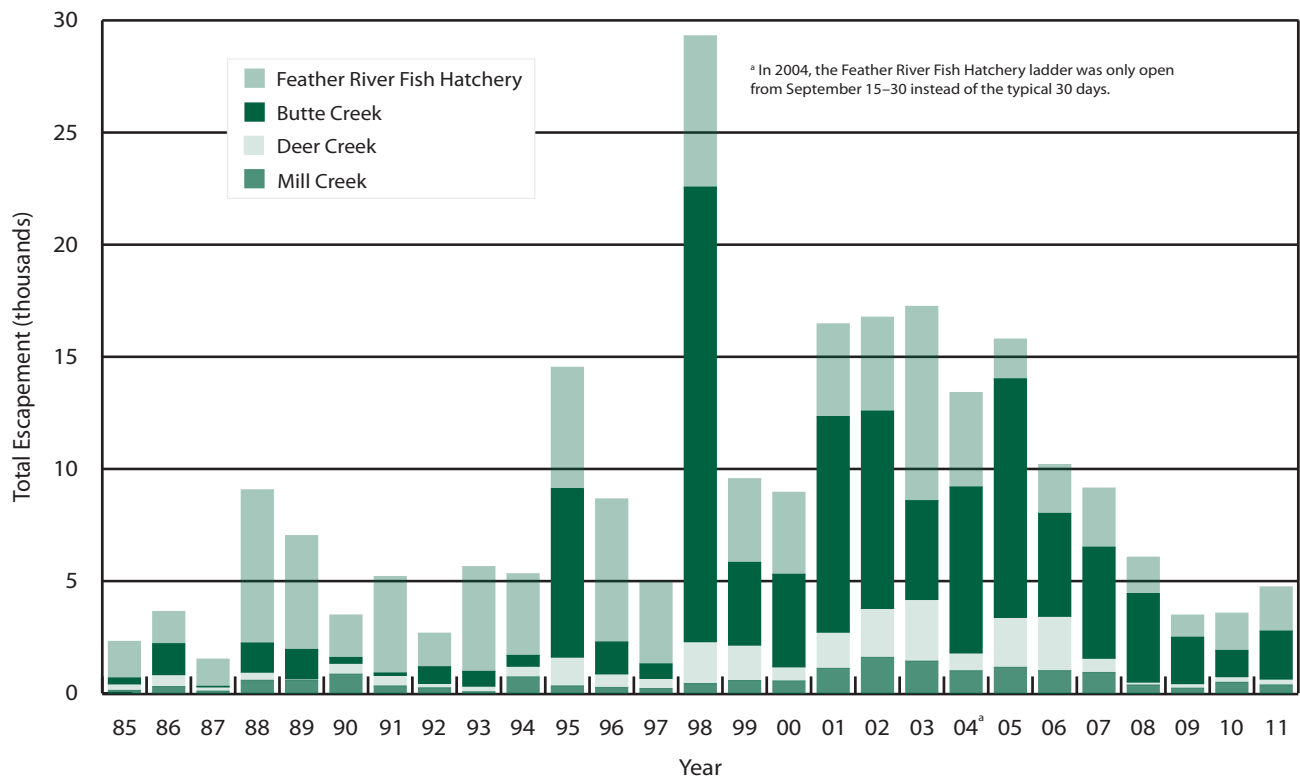


Figure 3-5 Estimated Total Adult Spring-run Chinook Salmon Escapement, 1985–2011

over the prior year, but generally remained similar to the very low levels observed over the last decade. Pelagic fish species in decline include Delta Smelt, Longfin Smelt, Striped Bass, and Threadfin Shad. These declines have had significant management consequences, including limits on pumping operations for the protection of Delta Smelt (listed as threatened under ESA and endangered under CESA) and Longfin Smelt (listed as threatened under CESA).

Since 2005, IEP scientists have been coordinating studies investigating potential causes of POD. In 2010, they prepared a synthesis of major results from research investigating the effects of ecosystem and environmental drivers on declining species (*IEP Pelagic Organism Decline Work Plan and Synthesis of Results* is available on DWR's website). In this synthesis, a new conceptual model was put forward, hypothesizing that POD was caused by changes to multiple and interacting environmental variables, such as outflow, turbidity, and salinity, which led to fundamental changes in both physical aspects and community composition of the Delta ecosystem. This "ecosystem regime shift" conceptual model has been used to explain dramatic shifts in other aquatic systems and will serve as a working hypothesis for future POD investigations. In 2011, studies focused on examining POD species in relation to the ecosystem regime shift model. In addition, at the end of 2011, the IEP recommended the formation of the IEP Management, Analysis, and Synthesis Team to synthesize scientific datasets with the goal of addressing pressing management information needs. Delta Smelt will be a major focus of the team's efforts.

Feather River Fish Studies

In the early 1990s, Feather River fish studies were initiated to document and monitor fish populations in the lower Feather River. Early efforts focused on studies to identify flow requirements for Chinook Salmon

and steelhead. The Feather River Program progressively expanded since it was established in the mid-1990s to prepare for the Federal Energy Regulatory Commission relicensing process associated with the Oroville Facilities. Field program elements have expanded to include operation of rotary screw traps (RSTs), acoustic and radio telemetry, salmon and steelhead spawning surveys, salmon escapement surveys, spring-run Chinook Salmon tagging, otolith thermal marking studies, snorkel surveys, Green Sturgeon studies, and steelhead passive integrated transponder (PIT) tagging.

The study area is generally divided into the low-flow channel, from the Fish Barrier Dam downstream to the Thermalito Afterbay Outlet, and the high-flow channel, from the Thermalito Afterbay Outlet downstream to the confluence with the Sacramento River at Verona (Figure 3-6).

Rotary Screw Traps

RSTs capture juvenile salmon and steelhead as they emigrate from the Feather River. Over the last 14 years, DWR has used RSTs as the primary method to assess the general abundance and timing of emigrating juvenile salmon and steelhead in the lower Feather River. In addition, large numbers of naturally produced salmon have been coded wire tagged (CWT) in an effort to examine their return success. This long-term monitoring yields valuable baseline information about juvenile salmonid production in the lower Feather River and the effects of project operations on abundance and migration timing.

Emigration timing and speed measurements confirm that most naturally produced juvenile Chinook Salmon move rapidly through the upper reaches of the lower Feather River. Consistent with select years of trapping data, turbidity may influence the emigration timing of naturally produced juvenile salmon. However, other studies

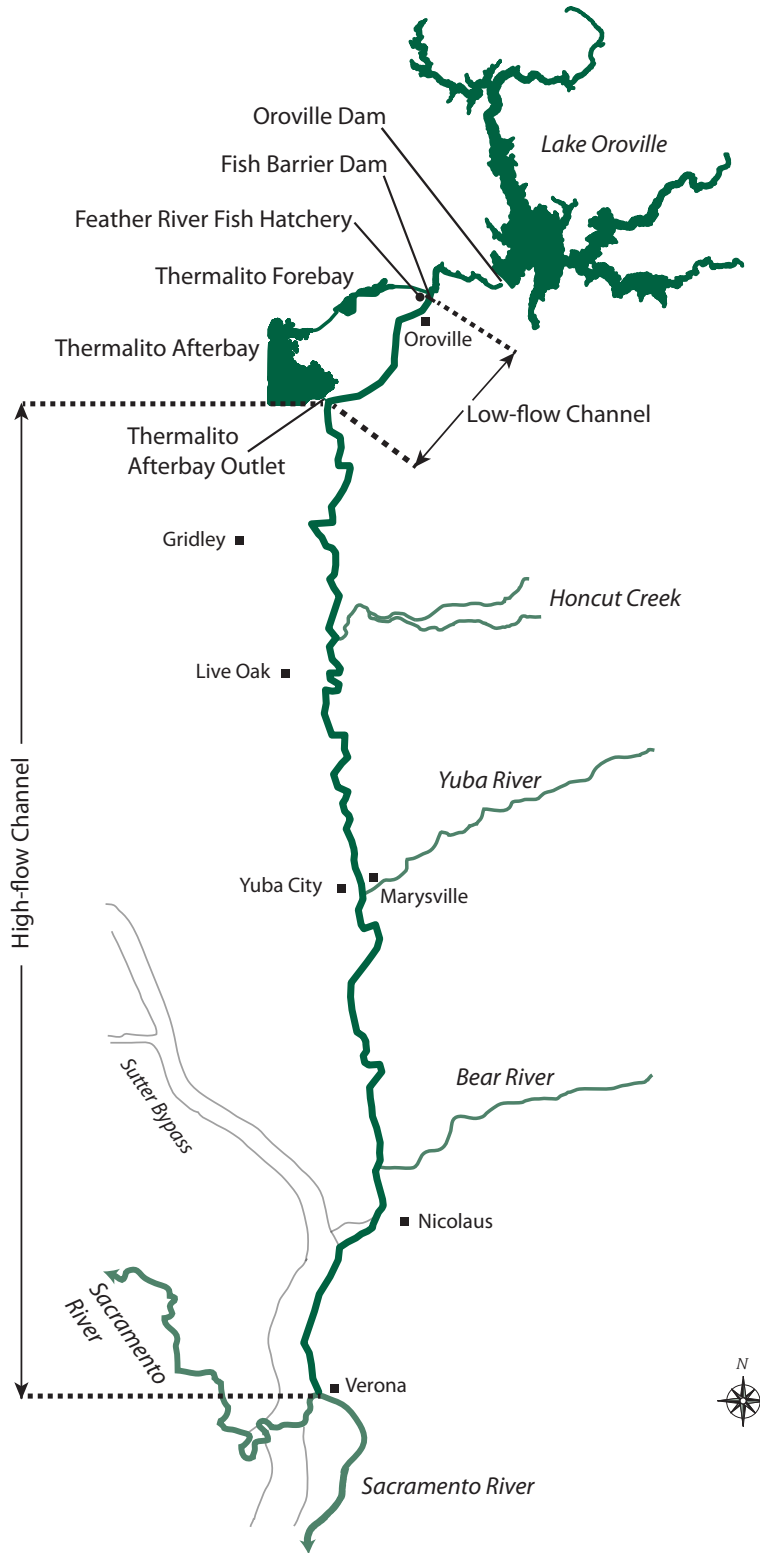


Figure 3-6 The Lower Feather River

demonstrate that the timing of adult spawning plays a large role in determining juvenile salmon emigration patterns as well.

The 2011 season was fished throughout the emigration period (December through August). Two RST locations were used to assess the timing and general abundance of juvenile Chinook Salmon, steelhead, and other fishes emigrating in the lower Feather River. Within the low-flow channel, one RST (Steep Riffle) was stationed at River Mile (RM) 61, approximately 2 miles above Thermalito Afterbay Outlet. Within the high-flow channel, two RSTs were fished in tandem below Sunset Pumps at RM 38 from the beginning of December 2010 through June 2011. The Steep Riffle location provided a passage estimate of 12,289,580 juveniles, and the Sunset Pumps location estimate was 8,576,905 juveniles.

Although Chinook Salmon and steelhead were the primary targets of trapping efforts, records were kept on all fish species caught. Twenty-nine species were caught during the 2011 season. Chinook Salmon was the dominant species, comprising 99 percent of the catch. Of the total salmon catch during the 2011 trapping season, 1,746,619 were caught in the low-flow channel and 100,590 were caught in the high-flow channel.

In 2011, juvenile CWT salmon were used to analyze timing, survival, and trap efficiency. Based on RST efficiency estimates, it was calculated that 12,450 CWT salmon passed by the recapture point during the 2011 study period.

The emigration time over the 21-mile reach from the Thermalito Afterbay Outlet to Sunset Pumps varied significantly among release groups, taking an average of 5.1 ± 1.9 days. The average speed of the recaptured salmon fry was approximately 8.0 ± 1.7 miles per day.

In 2011, there was no significant relationship between either timing or speed of emigration and the physical characteristics of the river at the time of CWT fish release.

The mean survival index for the CWT release groups (over the 21-mile river reach) was 0.12 ± 0.02 . Emigration timing and speed measurements confirmed that most naturally produced Chinook Salmon move through the upper reaches of the high-flow channel rapidly.

Acoustic and Radio Telemetry

Acoustic and radio telemetry gathers baseline information on the migration and holding patterns of adult Chinook Salmon in the lower Feather River. A telemetry study was conducted to collect additional data to evaluate the relationship between water temperature and migration patterns of prespawning adult Chinook Salmon.

Chinook Salmon with a spring-run life history enter freshwater in early summer and hold in the river up to several months before spawning. In order to collect additional data to evaluate water temperature and migration patterns of prespawning adult Chinook Salmon, spring-run adult Chinook Salmon are captured and tagged with radio tags or acoustic tags to document their habitat use. Because the water temperature regime associated with the ongoing operation of the Oroville Facilities may expose prespawning adult Chinook Salmon to elevated water temperatures during the migration and holding period, radio and acoustic tagging was implemented to determine whether the pools downstream of the Thermalito Afterbay Outlet provide water temperatures suitable for holding.

Between May 31 and June 23, 2011, 23 adult Chinook Salmon designated as having spring-run life history traits were captured using hook-and-line sampling (angling) and implanted with acoustic tags. These fish were monitored along the 67-mile stretch of river

from the Fish Barrier Dam near the FRFH to the confluence with the Sacramento River at Verona. Thirty submersible hydrophone receivers positioned at various locations picked up the signals from the implanted tags as the fish passed the receivers. Mobile tracking was performed approximately once a week from June through November using an ultrasonic receiver mounted in a boat. Fixed station receivers were checked at least once per month during the survey season. All 23 (100 percent) of the tagged fish were subsequently detected. Movement of fish was observed through October.

Due to low numbers of fish returning to the FRFH in June, an attempt was made to attract additional adult spring-run Chinook Salmon for hatchery broodstock purposes by increasing flows in the low-flow channel and simultaneously decreasing flows in the high-flow channel. The 2011 spring-run telemetry study data was used to determine whether pulse flows in the low-flow channel have a positive effect on upstream migration.

The pulse flow was conducted from June 20–25, 2011, with an increase from 700 cfs to 2,600 cfs in the low-flow channel and a decrease from 10,000 cfs to 6,100 cfs in the high-flow channel.

Two (8.7 percent) of the fish showed no upstream movement and were last detected 1 mile below their respective tagging locations, one below Sunset Pumps (RM 38) and one below the Thermalito Afterbay Outlet (RM 59). Two other fish were last detected near the FRFH at the end of June, one of which was recovered in the hatchery during spawning.

Of the 23 acoustic-tagged fish, 14 were used in the pulse-flow analysis. Ten (71 percent) showed a positive upstream response that coincided with the pulse flows.

Spawning Surveys

To better understand Feather River salmon and steelhead spawning characteristics, redd surveys are performed to determine abundance and distribution and identify the location, timing, magnitude, and physical characteristics of natural spawning sites in the lower Feather River. The surveys are generally performed weekly, and most of the available spawning area between the Fish Barrier Dam and Honcut Creek is searched.

Salmon

The 2011 Chinook Salmon redd survey began on September 11 and continued through November 13. During the eight weekly surveys, 1,592 mature redds were found within the spawning area between Table Mountain Riffle (RM 66.9) and the Thermalito Afterbay Outlet (RM 59) in the low-flow channel. Another 264 redds were discovered in the high-flow channel from the Thermalito Afterbay Outlet to the Gridley Bridge.

The week 4 survey (October 9 to October 11) covering the low-flow channel identified the highest number of redds with 751. The second highest total was 336 redds for the survey conducted September 25 and 26 covering the area from Table Mountain Riffle (RM 66.9) to Eye Riffle (RM 60.2). The location with the largest number of redds was the Auditorium Riffle area with 573 (36 percent). Trailer Park Riffle was next at 168 (11 percent). The uppermost 3-mile section of the river between the Fish Barrier Dam and Trailer Park Riffle contained 81 percent of the Chinook Salmon redds in the low-flow channel and high-flow channel.

Steelhead

In 2011, a total of 26 steelhead redds were identified during the eight weekly surveys. Steelhead redds were first observed on January 3 (survey week 1) with newly constructed redds continuously observed through February 23 (survey week 8).

Steelhead redd construction was consistent through the first 6 weeks of the sampling period with three to five new redds observed per week. No newly constructed steelhead redds were observed during survey weeks 7 and 8.

During the 2011 sampling period, 100 percent of the steelhead redds were located in the low-flow channel and 92.3 percent were within 1 mile of the Fish Barrier Dam. This pattern is generally consistent with past steelhead redd surveys and affirms preference for upstream spawning distribution.

Salmon Escapement Survey

The purpose of the salmon escapement survey is to evaluate the abundance, distribution, and timing of Chinook Salmon adults spawning in the river.

The survey provides information crucial to monitoring, managing, and conserving the Feather River's salmon populations. The data are used to identify trends in population and age structure, track patterns in spawning distribution, determine proportions of hatchery versus wild fish, and explore environmental effects on salmon survival rates. Estimating the number of salmon returning to spawn is the basic goal of the survey. This estimate is based on a weekly mark and recapture experiment in which salmon carcasses are tagged, chopped, and placed back into the river. The rate at which tagged carcasses are recovered (the recovery rate) relative to the number of carcasses checked for tags (chopped) provides the basis for an estimate of the total spawning population.

The Chinook Salmon spawning escapement survey began September 5 and continued through December 21, 2011. The survey was conducted in the low-flow channel and the high-flow channel from the Thermalito Afterbay Outlet downstream to the Gridley Bridge. Due to the low numbers of returning

fish in the high-flow channel, the data were pooled with the low-flow channel data to generate one estimate for the lower Feather River.

The carcass mark-recapture study resulted in a spawning population estimate of 47,301 Chinook Salmon for the lower Feather River. There were an estimated 11,668 grilse (fish less than 65 centimeters fork length). These estimates include both fall-run and spring-run Chinook Salmon since their spawning is currently not fully segregated on the Feather River.

Approximately 94.1 percent of the spawning population utilized the low-flow channel. Since 2000, the long-term average for the low-flow channel's spawning population is 79.1 percent. In the low-flow channel, survey section 10 (RM 65.5) had the highest carcass concentration followed by section 8 (RM 66.5). The highest concentrations of carcasses in the high-flow channel were found in sections 34 (RM 53) and 38 (RM 51).

Spring-run Chinook Salmon Tagging

To better understand spring-run Chinook Salmon life history in the lower Feather River, a program was developed to mark spring-run Chinook Salmon entering the FRFH. The spring-run Chinook Salmon tagging program segregates spawning of spring- and fall-run Chinook Salmon in the hatchery. The program also investigates potential differences in spawning distribution and timing of the early arriving spring-run salmon in the river.

Early arriving spring-run salmon entering the hatchery were marked with individually numbered Hallprint dart tags for identification. Once marked, the fish were released back in the river. During the hatchery spawning season, the tags enabled hatchery staff to distinguish the early arriving spring-run fish from the fall-run fish, so that spring-run fish could be spawned separately

from the fall-run. The tags also enabled the escapement survey crew to differentiate spring- and fall-run salmon, so that potential differences or trends in the in-river spawning behavior of the two runs could be analyzed.

In 2011, 6,028 Central Valley spring-run Chinook Salmon were tagged at the FRFH. Tagging began on June 6 and ended on July 5. When spawning commenced in the fall, a total of 3,600 tagged fish were recaptured: 1,969 at the FRFH and 1,631 in the river escapement survey.

Otolith Thermal Marking Studies

The Chinook Salmon run in the Feather River consists of both Central Valley spring-run and fall-run fish, both of which are heavily supplemented by the FRFH. To effectively determine the composition of the run (spring-run versus fall-run) and the origin of the fish (hatchery versus naturally produced), DFW and DWR developed an otolith thermal marking program for the FRFH. Thermal marking is an efficient method to mark 100 percent of the fish produced at the hatchery.

In 2005, 100 percent marking of hatchery-produced spring- and fall-run Chinook Salmon began. In 2011, otolith collection continued, and otoliths from 2009–2010 were being processed and analyzed. With continuation of this program, DWR will be able to definitively determine the origin and the proportions of spring- and fall-run fish within the river and the hatchery. With known origin and race, more advanced otolith analysis techniques can be employed to investigate potential differences in life history strategy for fall- and spring-run fish, as well as hatchery and naturally produced Chinook Salmon. This will provide valuable information to evaluate the effectiveness of past management decisions aimed at the recovery of natural-origin Chinook Salmon and guide future restoration actions.

Snorkel Surveys

From 1999 to 2001, DWR conducted a snorkel survey focusing on juvenile steelhead, but including other species and life stages. In 2010, DWR reinstated the lower Feather River snorkeling surveys with the following objectives:

- (1) determine the relative abundance and distribution of juvenile Chinook Salmon and steelhead prior to habitat improvements;
- (2) identify habitat conditions (depth, substrate, velocity, and cover) where juvenile Chinook Salmon and steelhead occur;
- (3) identify potential sites for gravel supplementation, channel improvement, and structural habitat restoration; and
- (4) identify habitat deficiencies for juvenile Chinook Salmon and steelhead in the lower Feather River prior to habitat improvement implementation.

In 2011, objectives (1) and (2) were achieved. In addition, channel size was identified as an important predictor of age-0 abundance, and other high-use areas of the low-flow channel that may benefit from habitat improvements were identified.

As the study progresses, additional sampling and analyses are expected, and as habitat restoration projects begin, these and future surveys will help guide and improve habitat projects.

Green Sturgeon Studies

This project fulfills some terms and conditions listed in NOAA Fisheries' draft biological and conference opinion for the relicensing of the Oroville Facilities. The primary objectives for this sturgeon study were to:

- determine if there are adult migration barriers;

- evaluate migration patterns including residence times and factors affecting them;
- identify distribution and habitat preferences;
- evaluate the effect of Oroville Facilities operations on passage success and distribution;
- estimate the annual abundance of adult Green Sturgeon;
- determine potential spawning grounds that can be target areas for egg and larval surveys; and
- provide DWR, the Federal Energy Regulatory Commission, NOAA Fisheries, and DFW with data to make management decisions concerning future monitoring programs, operational changes of the facilities, and/or habitat enhancement within the lower Feather River.

An acoustic telemetry tagging study coupled with a sonar study helped identify how operation of the Oroville Facilities affects Green Sturgeon in the lower Feather River.

Sonar surveys were conducted between February 22 and November 3, 2011. Analysis of data confirmed an observed 137 sturgeon between April 11 and September 8. The majority of sightings occurred in April with a population estimate of between 21 and 28 sturgeon.

Acoustic tags were placed inside two Green Sturgeon and one White Sturgeon at the Thermalito Afterbay Outlet. One Green Sturgeon emigrated on September 6 and the other on October 4. The White Sturgeon emigrated from the lower Feather River on December 25.

DWR was able to gather foundational data for all the primary objectives.

Lower Feather River Green Sturgeon Spawning Survey

The primary objectives for this study were as follows:

- (1) determine if spawning occurs in the lower Feather River;
- (2) identify spatial and temporal distribution;
- (3) characterize habitat preferences; and
- (4) determine if eggs are viable.

Two sites were surveyed based on locating sturgeon aggregations with sonar. Thirteen Green Sturgeon eggs were sampled between June 14 and 22 in the Thermalito Afterbay Outlet pool (RM 59). Eggs were not collected from Sunset Pumps (RM 38).

It was determined that spawning occurred in the lower Feather River (objective 1) and that eggs were viable (objective 4). DWR has begun to: identify spatial and temporal distribution (objective 2); characterize habitat preferences (objective 3); and provide data for making management decisions on future monitoring programs, operational changes of the facilities, and habitat enhancement within the lower Feather River.

Steelhead PIT Tagging

A broad range of restoration and recovery efforts have been initiated in the lower Feather River to bring about the recovery of its steelhead population; however, the ability to measure their success or improve the status of Central Valley steelhead has been hampered by a lack of information regarding steelhead life history and population dynamics. Because of this lack of information, DWR began a tagging program aimed at identifying behavior and life history traits of steelhead spawned at FRFH.

In December 2008, a passive integrated transponder (PIT) tagging program began at the FRFH. All steelhead used for broodstock at the FRFH are returned to the river.

PIT tagging adults prior to their release allows for future returning steelhead to be identified. Data gathered from returning tagged broodstock will provide information on multiyear return rates, relative success of brood years, and behavior within a spawning season.

In the 2010–2011 season, DFW began collecting tissue samples from spawned fish. Using a hole-punch, a small amount of tissue was taken from the caudal fin. A PIT tag shed was identified by the presence of a hole-punch tag and the absence of a detectable PIT tag. The hole-punch mark enabled the evaluation of PIT tag shed rates for post-spawn males and females.

Run size was determined and repeat spawner return rates were calculated. In 2011, the proportion of first-, second-, and third-time spawners based on multiyear recaptures was estimated.

FRFH steelhead run sizes for the 3 years of the study have varied greatly, from 232 fish in the 2009 season, to 59 fish in the 2010 season, and 534 fish in the 2011 season. In-season recapture rates were 8.19 percent, 6.78 percent, and 20.04 percent for these seasons, respectively. Males were recaptured multiple times in-season, while females were not.

In the 2010 season, 3 of the 59 fish (5.08 percent) were recaptured from the previous year. In the 2011 season, 5 of the 534 fish (0.94 percent) were recaptured from previous years. Based on PIT tag recoveries, the estimated spawning frequency for 2011 was 99.06 percent first-time spawners, 0.56 percent second-time spawners, and 0.38 percent third-time spawners.

A total of twelve in-season recaptures in the 2011 season had shed their PIT tags. The PIT tag shed rate for males was 3.8 percent (3 of 78) and for females was 31.0 percent (9 of 29).

Fish-related Mitigation Projects

In 1986, DWR and DFW signed the Delta Pumping Plant Fish Protection Agreement (Delta Fish Agreement) to annually provide funds to offset direct losses of Chinook Salmon, steelhead, and Striped Bass at Banks Pumping Plant. The Delta Fish Agreement is commonly referred to as the Four Pumps Agreement because it was adopted as part of the mitigation for four additional pumps at Banks Pumping Plant. Direct losses are defined as losses of fish that occur from the time fish are drawn into Clifton Court Forebay until the surviving fish are returned to the Delta. In principle, DFW and DWR intended this agreement to offset direct losses of all fish caused by the diversion of water by the pumping plant starting in 1986. However, at that time, information on impacts and measures to offset those impacts was sufficient only to deal with Chinook Salmon, steelhead, and Striped Bass. The agreement allowed for addressing impacts on other fish species once impacts could be identified and measures could be developed that would offset such impacts.

The process that led to this agreement included an advisory committee of representatives from interest groups concerned with fish resources affected by the SWP, including, but not limited to, representatives of the SWP water contractors, sport and commercial fishing groups, and environmental groups. The agreement formalized the Delta Pumping Plant Fish Advisory Committee.

To mitigate fish loss, mitigation projects are selected and funded by the Delta Fish Agreement. The agreement outlines how project proposals are reviewed and selected for funding and gives priority to mitigation measures for habitat restoration and other nonhatchery measures. Under the agreement, DWR calculates fish loss as

prescribed in the agreement, and approved mitigation projects earn fish mitigation credits to satisfy the fish loss mitigation provisions in the agreement. Mitigation is on a fish-for-fish basis.

DWR and DFW work with the Delta Pumping Plant Fish Advisory Committee to review the success of the agreement in offsetting the direct effects of diversions by Banks Pumping Plant. If warranted, the agreement can be renegotiated to fulfill the SWP's responsibilities to compensate direct fish loss. The agreement requires DWR and DFW to conduct an annual review and report the results.

The agreement provides for two funding components. One component is the Annual Mitigation Account for compensating the annual fish loss. It has no expiration date. The second is a \$15 million Lump Sum Account provided by DWR for additional projects to compensate for post-1986 fish loss. The agreement specifies that the \$15 million must be expended by December 29, 1996.

The Delta Fish Agreement has been amended three times:

- Amendment 1 (1996)—extended the period to expend the remaining \$9 million of the \$15 million to December 29, 2001;
- Amendment 2 (2001)—extended the period to expend the remaining \$5 million of the \$15 million to December 31, 2004; and
- Amendment 3 (2004)—extended the period to expend the remaining \$3.6 million of the \$15 million to December 31, 2007.

Since 1986, DWR has spent \$57 million on mitigation projects developed under the Delta Fish Agreement. (For a list of some of the mitigation projects initiated,

approved, or implemented in association with the agreement, see Bulletin 132-09.) Mitigation fund expenditures through December 31, 2011, were \$44 million for the Annual Mitigation Account and \$13.5 million for the \$15 million Lump Sum Account. Funds approved but unexpended from each account were \$10 million and \$1.5 million, respectively.

Climate Change

In this century, climate change will have a dramatic effect on water supply, flood management, and ecosystems. The SWP is particularly vulnerable to changes in climate. For example, climate warming is expected to continue to diminish the natural snowpack and shift reservoir inflows to earlier in the year when it cannot be stored due to flood control rules. In the future, sea level rise may also impair DWR's ability to efficiently operate the SWP. For instance, as sea levels rise, more saline water flows into the Sacramento-San Joaquin Delta, the heart of California's water supply system. To counter this sea water intrusion, additional water may need to be released from reservoirs. And climate change will exacerbate existing ecological issues in Central Valley rivers and the Delta by raising water temperatures, increasing sediment loading (as a result of increased wildfires and more extreme precipitation events), and increasing water demands.

DWR is committed to contributing to statewide, national, and international efforts to mitigate the future impacts of climate change by reducing greenhouse gas (GHG) emissions from its activities and adapting to expected climate changes. DWR's efforts throughout 2011 represent the continuation of its multipronged approach to addressing these issues by conducting research to better understand potential future impacts, monitoring and reporting GHG emissions, and developing plans and strategies to improve the resiliency of SWP facilities

and operations. During 2011, DWR added two additional activities to address climate change: consultation with outside experts and data development and curation.

Completed in 2011

Research

Isolated and integrated effects of sea level rise, seasonal runoff shifts, and annual runoff volume on California's largest water supply.

This study used different methods of climate projection to better understand the strengths and weaknesses of each method and how use of each might influence modeling results for water resource planning purposes. Reservoir inflow projections were made and used in an operations model to simulate future climate and water delivery conditions. This study was published in the *Journal of Hydrology* in 2011.

Ongoing in 2011

Research

Upper Watershed Restoration. DWR continued to work with the U.S. Forest Service on a study initiated in 2009 to investigate the hydrologic effects of upper watershed restoration. DWR is funding a 3-year investigation of the hydrologic effects of meadow restoration and how restored meadows can contribute to improved hydrologic and ecosystem functioning.

During 2011, the project completed a bibliography of scientific literature pertaining to meadow restoration and its beneficial effects on streamflow and an inventory of meadow communities in the Sierra Nevada significantly more accurate than previous inventories.

Additionally, during 2011, the following activities were initiated and are ongoing. The extent and degree of meadow erosion is being quantified by field measurements in a sample of meadows throughout the Sierra Nevada. Instrumentation for determination

of meadow water budget and measurements of hydrologic parameters has been installed in nine degraded and undegraded meadow communities. Flow processes in mountain meadows are being modeled and investigated to predict the effects of meadow erosion.

Sensitivity Analysis of Sierra Nevada Upper Watersheds to Temperature Changes Using the Soil and Water Assessment Tool.

Hydrologic models are essential tools for evaluating long-term hydrologic changes in California. The Soil Water Assessment Tool (SWAT) is being used to develop individual models of six representative Sierra Nevada watersheds: the Yuba River, Feather River, and American River in the northern Sierra; and the Tuolumne River, Merced River, and San Joaquin River in the southern Sierra. A common and consistent database of digital elevation, land use, soil data, and climate data is used with a geographic information system to develop the SWAT models.

During 2011, SWAT models were developed and calibrated for outflows for 10 watersheds: the Shasta River, Feather River, Yuba River, American River, Merced River, Tuolumne River, Trinity River, Bear River, San Joaquin River, and Putah Creek. For seven of the watersheds, models determined how outflows were affected by modified hydrology resulting from increased air temperature.

The project will continue with the development and calibration of computer-based rainfall/runoff models for other watersheds in the Sierra Nevada and Coast Range mountains to determine impacts of increased air temperature on outflows and use of developed models to determine the impacts of potential global warming.

Reoperation of Water Supply and Flood Protection Systems. California's water system is composed of State, federal, and local agencies, each having infrastructure

in place to provide water supply and flood control benefits. The current operation of these independent systems is based on physical and legal constraints. Changes in the climate, legal framework, and social values associated with water use may require modifications to existing operations and management procedures, new facilities, and new laws.

As authorized in Senate Bill X2 1, DWR initiated a system reoperation study to identify potential reoperation strategies of California's existing water supply and flood protection systems that will optimize the use of existing facilities and groundwater storage capacity. Senate Bill X2 1 defines the following objectives for the System Reoperation Program:

- integrate flood protection and water supply systems to increase water supply reliability and flood protection, improve water quality, and provide for ecosystem protection and restoration;
- reoperate existing reservoirs, flood facilities, and other water facilities in conjunction with groundwater storage to improve water supply reliability, flood control, and ecosystem protection, and to reduce groundwater overdraft;
- promote more effective groundwater management and protection and greater integration of groundwater and surface water resource uses; and
- improve existing water conveyance systems to increase water supply reliability, improve water quality, expand flood protection, and protect and restore ecosystems.

A plan of study for the project was completed in 2011.

More information on the System Reoperation Program can be found on DWR's website.

National Research Council Sea Level Rise on the Coast of California, Oregon, and Washington.

In 2011, work continued on the National Research Council's sea level rise study called for in Executive Order S-13-08. Serving as overall project manager, DWR executed contracts with four other State agencies and with the states of Oregon and Washington for their financial support of the study. Three federal agencies—the U.S. Geological Survey, National Oceanic and Atmospheric Administration, and U.S. Army Corps of Engineers are also providing funding. The study report will provide best available science estimates of a range of likely amounts of local sea level rise in 2030, 2050, and 2100. The report is expected to be completed in late spring 2012.

Planning

Integrated Resource Plan for the SWP. To help reduce the SWP's reliance on fossil-fired power generation, with its associated adverse impacts, DWR has developed an integrated resource plan for procuring power that will increase the use of renewable energy as part of the SWP's power portfolio, and thereby reduce GHG emissions in California. This plan is consistent with State policy and the goals established by Executive Order S-3-05 (which established GHG emission reduction goals for California).

Prior accomplishments include:

- commitment to termination of the long-term power purchase agreement for energy from Reid Gardner Unit No. 4, a coal plant in Nevada (the SWP's carbon dioxide emissions levels will be reduced to nearly half of what they were in 1990);
- completion of a renewables procurement plan;
- entrance into a long-term power purchase agreement with Northern California Power Agency for 33.5 percent of the output of the Lodi Energy Center, which will be a low GHG-emitting

generating plant that will be operational in 2012; and

- development and maintenance of a transparent and accurate record of the SWP's energy profiles, baselines, and GHG emissions.

Accomplishments in 2011 included:

- issuance of a Request for Proposal for qualified renewable energy to serve the SWP;
- ongoing investigations of cleaner technologies such as natural gas combustion turbines, wind energy, small hydroelectric generation, and energy efficiency projects for suitability to serve SWP load;
- completion of an initial evaluation of adding a second small hydroelectric generating unit at Alamo Powerplant;
- initiation of discussions and a memorandum of understanding with the University of California for solar development adjacent to SWP's Pearblossom Pumping Plant; and
- initiation of an energy efficiency improvements study that includes the refurbishment and replacement of DWR's hydroelectric generators and pumps at key SWP plant facilities (further refurbishments or replacements at the Gianelli Pumping-Generating Plant and the Edmonston Pumping Plant, which are the largest SWP loads, are currently being studied).

DWR Climate Action Plan Phase I: GHG Emissions Reduction Plan. During 2011, work continued on development of Phase I of the Climate Action Plan—GHG Emissions Reduction Plan. The plan, when complete, will document

- DWR's progress and future plans for reducing GHG emissions consistent with the GHG emissions reduction targets established in Assembly Bill 32, Executive Order S-3-05, and DWR's own policies;

- the aggressive steps DWR will take to reduce its emissions by more than 80 percent below 1990 levels; and
- the steps that DWR will take to monitor its progress toward achieving these reductions.

During 2011, meetings and consultations were conducted with all of DWR's divisions that have operational control over activities that release GHGs. In January 2011, the first complete draft for internal review was released. Throughout 2011, additional refinements were made and additional drafts were circulated for review by the Climate Change Matrix Team, DWR Governance Board, and DWR staff. Additional reviews were also conducted with outside experts including attorneys from the Attorney General's Office. Completion of the GHG Emissions Reduction Plan is expected in mid-2012.

Reporting

2011 Emissions Reports to The Climate Registry. Between 2007 and 2009, DWR reported its estimated total direct and indirect GHG emissions to the California Climate Action Registry, and earned Climate Action Leader Status each year. In 2010, emissions reporting transitioned to The Climate Registry, which is a North America-wide registry.

DWR's emissions are primarily the result of electricity generation at DWR-owned power plants and power purchase transactions to provide power for operation of the SWP. DWR's 2011 Greenhouse Gas Emissions Report has been verified by an independent third-party verifier and accepted by The Climate Registry. DWR is currently in the process of reviewing its methodology for reporting emissions to The Climate Registry because the current methodology results in an overstatement of DWR's GHG emissions of approximately 1 million tons per year.

Initiated in 2011

Research

Tree-ring Reconstruction of Paleostreamflows in the Sacramento, San Joaquin, and Klamath River Basins. DWR executed a contract with the University of Arizona for development of tree-ring reconstructions of paleostreamflows in the Sacramento, San Joaquin, and Klamath river basins. Extending streamflow records beyond the relatively short period of the historical record provides an improved picture of climate variability and yields data for use in analyses. Contract work began in fall 2010; the final report will be completed in 2014.

Review and Consultation

Formation of a Climate Change Technical Advisory Group. In 2011, DWR issued a Request for Statements of Interest to serve on a voluntary climate change advisory board. DWR has received significant interest and expects to form the group in early 2012. The Climate Change Technical Advisory Group will be a review and consultation panel of outside experts in the fields of atmospheric science, hydrology, civil engineering/infrastructure, environmental science, climate data and statistics, social science, resource economics, land-use planning, law, and climate modeling. The Climate Change Technical Advisory Group will advise DWR on the scientific aspects of climate change, its impacts on water resources, the use and creation of planning approaches and analytical tools, and the development of adaptation responses. This standing technical advisory group on climate change impacts and adaptation serving all DWR programs provides external guidance and support for a variety of climate-related issues, including scientific review of climate change models and scenarios, interpretation of scientific information produced by the National Climate Assessment and the upcoming Fifth Assessment Report of the Intergovernmental Panel on Climate Change, and informing DWR's climate

change adaptation policies. Benefits include consistency in the scientific advice DWR receives on climate change and the administrative efficiency of not having redundant climate change advisory groups across DWR.

Data Development and Curation

Formation of DWR Climate Change Basic Data Workgroup. The workgroup formed in 2011, with monthly meetings to strategize on data collection and management issues within DWR. The workgroup is composed of representatives from the Division of Statewide Integrated Water Management, the Division of Flood Management, and DWR's regional offices. The project goals are to assess current climate data acquisition efforts at DWR, promote cooperation and coordination across programs, and strategize on issues of data storage, management, and dissemination. An internal memorandum report on volunteer climate data collection and future recommendations is being prepared for release in 2012. A partnership with the Western Regional Climate Center is being pursued for coordination of statewide climate data collection, storage, and dissemination.

Environmental Document Review

DWR's Division of Environmental Services, Environmental Document Review Section screens State Clearinghouse documents and circulates SWP-related materials for review by O&M, the State Water Project Analysis Office, and others, as necessary. Other divisions and offices are notified and asked to comment when their expertise is required. The Environmental Document Review Section was formally moved from the Division of Statewide Integrated Water Management to the Division of Environmental Services in April 2011.

Some environmental documents handled by the State Clearinghouse concern proposed activities that would affect the SWP. Such documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

During 2011, the Environmental Document Review Section tracked documents related to development along the California Aqueduct, levee encroachment, dam safety issues, water transfers and other water supply issues, wastewater treatment, quarry development, solar and wind power facilities, and climate change issues. Climate change issues increased from two documents in 2010, when Senate Bill 97 was added to the State CEQA Guidelines in March, to five climate change documents plus seven general plans with climate change issues in 2011.

DWR comments submitted through the CEQA and/or NEPA processes addressed a number of issues, including runoff from proposed developments, safety and water supply, conveyance of nonproject water through SWP facilities, encroachment on physical facilities, impacts to crossdrainage facilities, cropping patterns, and climate change.

In 2011, the Environmental Document Review Section screened 2,759 State Clearinghouse documents. After screening, 1,137 documents were referred for information, including notices of preparation and various final documents, and 140 formal referrals were made for negative declarations, notices of preparation, EIRs, and NEPA documents.

O&M received 87 formal referrals and the State Water Project Analysis Office received 5 formal referrals.

The total number of referrals to O&M and the State Water Project Analysis Office decreased by about one-fourth from 2010. A significant factor contributing to this decrease was the

overall decrease in documents submitted through the environmental process (down about 7 percent), probably related to the continuing effects of the economic downturn. While the reduction in submitted projects from the State Clearinghouse has continued, this appears to be slowing down.

In 2011, formal referrals to all other DWR reviewers, including the Central Valley Flood Protection Board and the Division of Dam Safety, were down 15 percent from 2010. This reduction may be relatively insignificant since the total number of referrals was small when compared to the total number of documents (56 were referred in 2010 and 48 in 2011).



Chapter 4 Water Quality Programs

Middle River at the State Route 4 bridge.

Significant Events in 2011

*T*he final environmental impact statement/environmental impact report for the *Suisun Marsh Habitat Management, Preservation, and Restoration Plan* was completed in November 2011.

Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, and the State Water Project Analysis Office.

The State Water Project (SWP) is the largest state-built, multipurpose water project in the United States. California's existence and continued prosperity depends on water. More than two-thirds of the people of California rely partly or wholly on the SWP for their daily water needs. The Department of Water Resources (DWR), Division of Operations and Maintenance (O&M) currently maintains 16 automated water quality monitoring stations at key locations along the SWP. This network of automated stations continuously monitors a variety of water quality parameters throughout the system and provides real-time data to SWP water contractors. In addition, field grab samples collected weekly, monthly, quarterly, or annually from more than 30 SWP locations are routinely analyzed for a broad range of constituents at the State's Bryte Chemical Laboratory.

Delta Water Quality

Maintaining adequate water quality to support multiple beneficial uses of water from the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) is of concern to DWR as well as other resource agencies. The State Water Resources Control Board (SWRCB) establishes water quality objectives to protect a variety of beneficial uses of water within the Bay-Delta. The objectives are contained within the water quality control plans (WQCPs) adopted by the SWRCB. Water quality objectives are also contained in Article 19 of the long-term SWP water supply contracts. The California Department of Public Health (CDPH) establishes maximum contaminant levels for treated drinking water.

Under its authority to protect beneficial uses of water, the SWRCB adopted the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 13, 2006 (Resolution No. 2006-0098). It contains objectives for flow, salinity, dissolved oxygen (DO) levels, and other parameters necessary for protection of various beneficial uses such as municipal and industrial, agricultural, and fish and wildlife.

The SWRCB adopted Water Right Decision 1641 (D-1641) in December 1999 (amended March 15, 2000). D-1641

implemented the objectives of the 1995 Bay-Delta Plan. One method used by the SWRCB to implement the objectives in the WQCPs is through conditioning water rights permits. D-1641 amends the water rights of a number of water rights holders—primarily those for the SWP and Central Valley Project (CVP)—to help achieve the WQCP objectives.

For additional background information about the SWRCB activities and the Bay-Delta Plan, see the sidebar, State Water Resources Control Board, and Chapter 7, Water Supply Development and Reliability.

Strategic Workplan for the Bay-Delta Estuary

In 2008, the SWRCB adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*. The strategic workplan identifies a broad, integrated list of water right and water quality activities. The workplan activities are divided into nine broad elements that cover a range of actions that implement SWRCB's and the Regional Water Quality Control Boards' (RWQCBs) core water quality responsibilities; continue meeting prior SWRCB and RWQCB commitments; respond to priorities identified by the Governor and the Delta Vision Blue Ribbon Task Force; and build on existing processes, such as the Bay Delta Conservation Plan (BDCP).

State Water Resources Control Board

The State Water Resources Control Board (SWRCB), established by the California Legislature in 1967, oversees water rights and protects water quality by setting and implementing statewide policy, administering appropriate water rights, coordinating with and supporting Regional Water Quality Control Board (RWQCB) efforts, and reviewing petitions that contest RWQCB actions. The five SWRCB members are appointed by the Governor and confirmed by the Senate. SWRCB is responsible for four major programs.

Water quality: to preserve, protect, enhance, and restore water quality.

Water rights: to issue permits for water rights specifying amounts, conditions, and construction timetables for diversion and storage.

Financial assistance: to assist local agencies and individuals with pollution prevention or clean-up.

Enforcement: to enforce water rights and water quality laws and regulations.

Under their water quality authority, the SWRCB and RWQCBs adopt water quality control plans (WQCPs) for each of the planning basins in the State. The WQCPs contain water quality objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for the protection of various beneficial uses, such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in a number of ways, depending on the circumstances, including imposing conditions on water right permits and licenses.

The SWRCB amended Water Right Decision 1641 (D-1641) on March 15, 2000, which placed terms and conditions on a number of water rights, primarily those for the State Water Project (SWP) and Central Valley Project (CVP). D-1641 implemented the objectives in the 1995 Bay-Delta Plan. The Department of Water Resources and the Bureau of Reclamation operate the SWP and CVP in coordination to meet the terms in D-1641 and other applicable regulatory requirements relevant to each project.

Current water quality objectives for the Sacramento-San Joaquin Delta and Suisun Marsh are contained in the *WQCP for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan), adopted December 13, 2006. The SWRCB is required to conduct periodic updates of the Bay-Delta Plan. As part of the update process, the SWRCB conducts proceedings to gather information, receive recommendations, consider public comments, and facilitate detailed discussions to evaluate new information relevant to potential changes to the water quality objectives.

Some of the recent issues of concern related to the WQCP include pelagic organism decline, special status fish species, Delta inflow, San Joaquin River flows, and southern Delta salinity.

In July 2008, the SWRCB adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, which prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the Bay-Delta.

The SWRCB staff prepare quarterly updates on the implementation of the workplan and, as appropriate, recommend modifying activities in the workplan to ensure that SWRCB actions continue to protect beneficial uses in the Bay-Delta. SWRCB will consider modifying the Bay-Delta strategic workplan as necessary.

In May 2011, SWRCB staff issued an update to the strategic workplan's element actions and timelines.

2006 Bay-Delta Plan Review

Water Code Section 13240 requires that the WQCP be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act. The comprehensive review of the 2006 WQCP and its implementation is one of the significant water quality related activities in the SWRCB strategic workplan.

The WQCP review and amendment process consists of review of the 2006 Bay-Delta Plan to identify elements that may need amendment or new elements that may need to be added, staff preparation of any amendments or revision of the entire WQCP, and SWRCB adoption of some or all of the amendments or revisions. SWRCB information-gathering activities may affect the scope of the WQCP review and may include a series of evidentiary hearings on a number of critical issues concerning the Delta's ecology. The BDCP environmental review may include some of the analyses needed for the comprehensive WQCP review. The intent of the comprehensive review is to establish interim and long-term water quality objectives in the Bay-Delta that are protective of fish and wildlife beneficial uses and the public trust. The comprehensive review will also develop a broad range of alternatives for potential changes to the Bay-Delta Plan and its implementation under the following scenarios: in the interim until any

new conveyance facility is completed; in the long-term with new conveyance facilities; and in the long-term in the event that a new conveyance facility is not constructed.

Review of the 2006 Bay-Delta Plan began in 2008. In 2011, SWRCB's ongoing review and update of the 2006 Bay-Delta Plan continued. SWRCB held workshops for discussion and consideration of the scope and content of SWRCB's environmental document relating to the review of the Bay-Delta Plan and the *Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives*. SWRCB initiated an external scientific peer review of the technical report; the peer review was completed in November 2011.

Operations Under D-1641

In 2011, DWR and the Bureau of Reclamation (Reclamation) jointly operated the SWP and CVP in accordance with D-1641, which includes water quality, flow, and operational criteria for the SWP and CVP Delta operations. SWP and CVP operations were coordinated to meet the various objectives of the Bay-Delta Plan, Central Valley Project Improvement Act, and biological opinions (BOs) for listed species as well as other regulatory requirements. Fish species currently listed under the Endangered Species Act and the California Endangered Species Act include the winter and spring runs of Chinook Salmon, Delta Smelt, steelhead, and Green Sturgeon.

Real-time monitoring of fish movement and conditions in the estuary aids daily water management and provides timely protection of targeted fish species from entrainment at the Delta pumping facilities.

(For a discussion of other environmental issues, see Chapter 3, Environmental Programs.)

D-1641 includes the requirement to monitor a number of stations within the Delta for specific water quality constituents. DWR conducts extensive monitoring in the Delta and the Suisun Marsh, as required. Figure 4-1 shows water quality compliance and monitoring stations throughout the Sacramento-San Joaquin Delta specified by D-1641.

Delta Cross Channel Gates

The Delta Cross Channel gates are operated in accordance with SWRCB D-1641. In 2011, the gates were open for 131 days to allow fresher Sacramento River water to flow into interior Delta channels toward the SWP and CVP export facilities. Reclamation's standard operating procedures call for gate closure when flow on the Sacramento River at Freeport reaches between 20,000 cubic feet per second (cfs) and 25,000 cfs to reduce flooding potential on the Mokelumne River and to prevent scouring on the downstream side of the gate structure. D-1641 contains measures that require gate closure under certain conditions from November 1 through May 20 for fisheries protection as requested by the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, and the Department of Fish and Wildlife (DFW).

Water Quality Standards

Water quality objectives in D-1641 are categorized by the beneficial uses they are intended to protect, including municipal and industrial, agricultural, and fish and wildlife. DWR operators adjust upstream releases and Delta exports in order to meet D-1641 water quality and flow standards. D-1641 contains salinity standards (recorded as electrical conductivity [EC]) for three stations in the South Delta downstream of Vernalis. The stations are primarily influenced by San Joaquin River flows and in-Delta diversions. San Joaquin River flows are not influenced by SWP upstream reservoirs, but local water

levels may be influenced by SWP exports, and circulation may be influenced by the annual placement of South Delta barriers.

For more information about the South Delta barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

Water Year 2010–2011 Classifications and Water Supply Indices

SWRCB's D-1641 contains water quality and flow standards that are conditioned by water year type and generally become less stringent in years with less precipitation. The water year classification system provides relative estimates of a basin's available water supply based on the amounts of rainfall, snowmelt runoff, and groundwater accretion rates. Water year types are classified as "wet," "above normal," "below normal," "dry," or "critical."

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) forecast on May 1 of each year determines the water year type for the implementation of flow and water quality criteria contained in D-1641. In 2011, the SWP and CVP were operated using water quality and flow criteria based on the May 1 forecast of a wet water year for the Sacramento River basin.

The Sacramento Valley 40-30-30 Index and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were both wet, based on all observed data for water year 2010–2011.

For a detailed discussion of water year 2010–2011, see Chapter 8, Water Supply.

Municipal and Industrial Objectives

D-1641 includes a year-round 250 milligrams per liter (mg/L) (maximum mean daily) chloride objective that is in effect at Delta

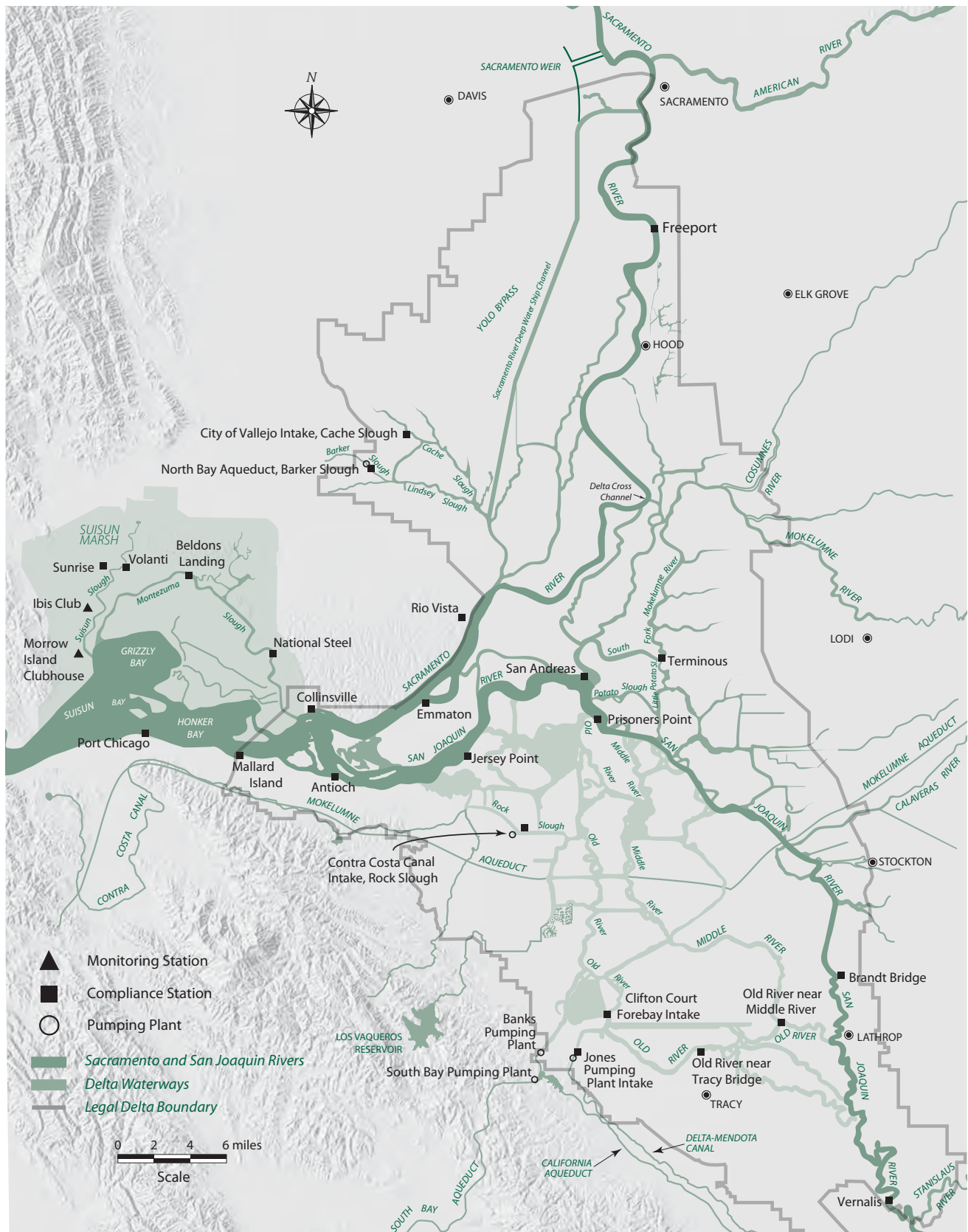


Figure 4-1 Decision 1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta

export locations (Contra Costa Canal Pumping Plant No. 1, Clifton Court Forebay, Jones Pumping Plant, Cache Slough at the City of Vallejo Intake, and Barker Slough). Chloride levels remained below the objective for all days in 2011.

An additional municipal and industrial water quality objective for chloride at the Contra Costa Canal Intake, near Rock Slough, specifies that the chloride level must be below 150 mg/L for a given number of days during the year, dependent upon the water year forecast. This objective was met in calendar year 2011.

Agricultural Objectives

D-1641 contains agricultural salinity objectives, which vary by location. The salinity objectives, recorded as EC, are based on both water year type and a 14-day running average during the irrigation season, from April to mid-August, at Emmaton, Jersey Point, Terminous, and San Andreas in the West and Central Delta. The agricultural salinity objectives at these Delta locations become less stringent under dryer conditions. Emmaton and Jersey Point met the objective in 2011. (Data for Terminous and San Andreas were not available.)

In the South Delta, the salinity objectives are based on a 30-day running average. The 0.7 millisiemens per centimeter (mS/cm) objective for the South Delta was met at Vernalis, Old River near Middle River, Old River near Tracy Road Bridge, and Brandt Bridge. The SWP and CVP are jointly required by D-1641 to meet the agricultural EC objectives imposed at these South Delta compliance locations.

See also, Chapter 2, Delta Resources, and Chapter 7, Water Supply Development and Reliability.)

Estuarine Habitat Protection Standard

The estuarine habitat protection standard incorporates modified X2 criteria (geographic isohaline) first established in the 1994 Delta Smelt BO. The upstream movement of 2 parts per thousand isohaline (2 parts per thousand of salt in the water), measured as 2.64 mS/cm at the surface, is maintained within a certain range of positions in the estuary by adequate Delta outflow. These positions (Collinsville, Chipps Island, Port Chicago, or Martinez) are associated with an abundance of fish and biota.

The requirement for meeting X2 criteria at Collinsville applies to all days during February through June. The number of days per month when the daily average EC maximum (2.64 mS/cm) is in effect at Chipps Island or Port Chicago is conditioned by the previous month's Eight River Index (more information about this can be found in Chapter 8, Water Supply). This may alternately be met with a maximum 14-day running average EC of 2.64 mS/cm or with specific Delta outflow, set as a 3-day average Net Delta Outflow Index (NDOI) of 7,100 cfs, 11,400 cfs, or 29,200 cfs, when the X2 position is at Collinsville, Chipps Island, or Port Chicago, respectively. The Port Chicago standard becomes effective when the Port Chicago 14-day EC average, immediately prior to the first day of the month, is less than or equal to 2.64 mS/cm.

The Eight River Index for January through May 2011, in million acre-feet, was 2.10, 1.96, 6.20, 5.23, and 4.94, respectively. The X2 habitat protection objective at Chipps Island was 28 days in February, 31 days in March, 30 days in April, 30 days in May, and 29 days in June.

Additionally in 2011, the X2 habitat protection objective at Port Chicago was met in the month of June for 4 days.

Net Delta Outflow Index Standard

Delta outflow cannot be measured directly due to the tidal influence in the Delta. Instead, an approximation of Delta outflow is calculated using measured inflows, exports, and estimated Delta water use. The NDOI was introduced in the 1995 Bay-Delta Plan and is now part of D-1641. NDOI calculates Delta outflow using inflows of the Sacramento River, the Yolo Bypass system, the eastside stream system (consisting of the Mokelumne, Cosumnes, and Calaveras rivers), the Sacramento Regional Treatment Plant, and a measurement of San Joaquin River flow at Vernalis.

Excess outflow conditions, as defined by the Coordinated Operations Agreement, allow for greater flexibility in project operations.

D-1641 sets specific minimum monthly NDOI standards for the protection of fish and wildlife based on water year type. In 2011, the monthly mean NDOI was highest in March, averaging 91,000 cfs. The monthly mean NDOI remained above 3,000 cfs during all months of the year, with the lowest monthly mean NDOI occurring in December, with 5,637 cfs. All NDOI standards were met in 2011.

River Flow Standards

D-1641 includes minimum flow requirements measured in the Sacramento River at Rio Vista. These flow standards, incorporated from the winter-run salmon BO, set flow requirements based on the May 1 Sacramento Valley water year classification forecast. Water year 2010–2011 was forecast to be wet, requiring mean monthly flows of 4,000 cfs for October and 4,500 cfs for November and December. During these periods, the 7-day running average could not be more than 1,000 cfs below the monthly standard. The actual mean monthly flows were 12,639 cfs for September; 12,010 cfs for October; 6,840 cfs for November; and 11,552 cfs for December.

If the X2 objective is required to be at or west of the Chipps Island location, wet year base Vernalis flows are set at 3,420 cfs from February to April 14 and from May 16 through June 30. The base-flow objective is relaxed to 2,130 cfs when X2 is required to be east of Chipps Island.

D-1641 requires the San Joaquin River spring pulse flow for April 15 to May 15 at Vernalis. This spring pulse flow requirement varies based on the location of X2 during April. However, the CALFED Operations Group may vary the actual timing and duration of the pulse attraction flow based on real-time monitoring data.

VAMP marked its twelfth and final year of formal compliance with D-1641 in calendar year 2011. Actions associated with VAMP were implemented between May 1 and May 31. For more information about 2011 VAMP activities, see Chapter 3, Environmental Programs.

Additional information about San Joaquin River water quality can be found in Chapter 5, Local Assistance.

Export Standards

D-1641 includes an export limitation for the SWP and CVP. It limits Delta exports to a ratio of Delta inflow to combined water project exports and is expressed as a maximum export rate in percentage of Delta inflow. The maximum percentage of diverted Delta inflow varies by month; for example, in February, it is conditioned by the previous month's Eight River Index. During the San Joaquin River spring pulse flow season, VAMP export rates are typically used as an alternative to the D-1641 spring export limitation, and the CALFED Operations Group may impose additional export restrictions.

The actual export amount is calculated using the 3-day average that combines

the inflow rate for Clifton Court Forebay (excluding Byron-Bethany Irrigation District diversions from Clifton Court Forebay) added to the Jones Pumping Plant diversion. The export-to-inflow ratio limit is reported as either a 3-day or 14-day running average. A 14-day running average of inflows is used unless storage withdrawals from upstream reservoirs are being made for export, in which case a 3-day average of inflows is used. In all water year types, the maximum combined export rate from February through June is 35 percent of Delta inflow. This rate may be relaxed in February during years with less precipitation to between 35 and 45 percent. From July through January, the export-to-inflow ratio rises to 65 percent.

During 2011, the Delta was in excess conditions from January 1 to November 30, for a total of 334 days. Within this period, combined SWP and CVP exports averaged about 18 percent of Delta inflow, meeting the 65 percent limitation in January and from July to December, while also meeting the 35 percent limitation from February to May.

The Delta was in balanced conditions for 31 days from December 1 to December 31. Within this period, combined SWP and CVP exports averaged about 54 percent of Delta inflow, meeting the 65 percent limitation.

South Delta Temporary Barriers Project

The South Delta Temporary Barriers Project, initiated as a test project in 1991, was extended for 5 years in 1996, and extended again for 7 years in 2001. The project was created partially in response to a 1982 lawsuit filed by the South Delta Water Agency and consists of rock barriers across four South Delta channels.

These temporary seasonal barriers are designed to improve local water levels and circulation patterns, protect fishery

resources, and improve water quality. They are placed across Middle River, Old River near Tracy, Grant Line Canal, and at Head of Old River.

For more information about the temporary barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

Special Study and Biological Surveys

DWR conducts several special studies and biological surveys each year. This includes a special study in the Stockton Deep Water Ship Channel (DWSC) during the late summer and early fall to monitor the occurrence of low DO levels. Low DO levels potentially cause physiological stress to fish and block the migration of salmon into the San Joaquin River. DWR also conducts biological surveys of benthic organism density and diversity and of phytoplankton biomass and community composition in the Sacramento-San Joaquin Delta, Suisun Bay, and San Pablo Bay.

Fall Dissolved Oxygen Study in the Stockton DWSC

Historically, during the late summer and early fall, DO levels in the eastern and central portions of the Stockton DWSC have dropped below both the 5.0 mg/L and 6.0 mg/L water quality objectives set by SWRCB and the RWQCB, respectively. These low DO levels are a result of several factors, including low San Joaquin River inflows, warm water temperatures, high biochemical oxygen demand, reduced tidal circulation, and intermittent reverse flow conditions in the San Joaquin River at Stockton.

To help reduce the severity of these low DO conditions, DWR normally installs a temporary rock barrier across Head of Old River during periods of projected low fall flows in the San Joaquin River.

In 2011, the spring barrier was not installed. Instead, a nonphysical “bubble barrier” was installed to prevent salmon from entering Old River. The fall Head of Old River barrier was not installed in 2011 because the existing flows and dissolved oxygen levels in the San Joaquin River were sufficient for Chinook Salmon, and it was not requested by DFW.

Methods

Monitoring DO concentrations in the Stockton DWSC was conducted by boat on 12 monitoring runs, from June 15 to November 23, 2011. During each run, 14 sites were sampled at low-water slack tide from Prisoners Point in the Central Delta to the Stockton Turning Basin at the terminus of the ship channel. Because monitoring results differ within the channel, sampling stations were grouped into western, central, and eastern regions. The western region of the channel begins at Prisoners Point and ends at Columbia Cut. The central region of the channel begins one-half mile east of Columbia Cut and ends at Fourteen Mile Slough. Finally, the eastern region of the channel begins at Buckley Cove and ends at Rough and Ready Island. The turning basin is unique within the channel because it is east of the entry point of the San Joaquin River into the channel and isolated from down-channel flows.

Results

During the period of this study (June 15 to November 23), DO levels varied by season and exhibited similar ranges between regions within the channel excluding the turning basin. Overall study period range was 6.3 to 9.8 mg/L at the surface and 6.5 to 9.4 mg/L at the bottom. In the western portion of the channel, DO concentrations ranged from 6.3 to 9.6 mg/L at the surface and 6.6 to 9.4 mg/L at the bottom. In the central portion of the channel, DO concentrations were variable, ranging from 6.6 to 9.4 mg/L at the surface and 6.5 to

9.3 mg/L at the bottom. In the eastern portion of the channel, DO levels tended to be more stratified than the other stations, ranging from 7.1 to 9.8 mg/L at the surface and 7.3 to 9.1 mg/L at the bottom. DO concentrations never fell below the State’s 5.0 mg/L and 6.0 mg/L objectives during the 2011 sampling.

Higher San Joaquin River inflows, as well as the absence of intermittent reverse flows near Stockton, coincided with improved DO conditions. Further monitoring operations for the fall 2011 special study were suspended after November 23, 2011.

Benthic Survey

The operation of the SWP can impact flow characteristics of the upper San Francisco Estuary and subsequently influence the density and distribution of benthic biota. Benthic biota are relatively long-lived and can respond to changes in physical factors within the estuary, such as fresh water inflows, salinity, and substrate composition. The benthic monitoring program documents changes in the composition, abundance, density, and distribution of the benthic biota within the estuary. Biological surveys conducted under the benthic monitoring program provide an indication of physical changes occurring within the upper estuary. In addition, benthic monitoring data are also used to detect and document the presence of newly introduced species within the upper estuary.

Benthic monitoring was conducted at 10 sampling sites distributed throughout the major habitat types within the estuary:

- Clifton Court Forebay Intake;
- San Joaquin River at Buckley Cove and at Twitchell Island;
- Old River opposite Rancho del Rio;
- Sacramento River below the Rio Vista Bridge and above Point Sacramento;
- Suisun Bay at Bulls Head Point;

- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Four bottom grab samples for benthic analysis and one sample for sediment analysis were collected monthly at each site during 2011. Samples were analyzed to identify organisms to the lowest possible identifiable taxon and to count all organisms collected.

DWR maintains a database of benthic organisms located within the upper estuary. The benthic database is dynamic and regularly undergoes peer review and update. When a new organism is identified at any of the sampling stations it is added to the database. In addition, the taxonomic names of organisms on the list are updated when sufficient evidence is produced to warrant such changes.

The benthic monitoring program collects a large number of organisms, but a relatively small number of species. A total of 211 species of benthic macrofauna were collected in 2011 at the 10 sampling sites. Of the 211 species, 10 represented 81 percent of all organisms collected:

- amphipods: *Ampelisca abdita*, *Americorophium spinicorne*, *Americorophium stimpsoni*, *Corophium alienense*, and *Gammarus daiberi*;
- Asian clams: *Potamocorbula* (formerly *Corbula*) *amurensis* and *Corbicula fluminea*;
- sabellid polychaete: *Manayunkia speciosa*; and
- tubificid worms: *Limnodrilus hoffmeisteri* and *Varichaetadrilus angustipenis*.

Of the 10 dominant species, *Potamocorbula amurensis*, and *Ampelisca abdita* represent macrofauna that inhabit a typically high saline environment and were found in

San Pablo Bay, Suisun Bay, and Grizzly Bay. *Corophium alienense*, *Americorophium spinicorne*, and *A. stimpsoni* tolerate a wider range of salinity. They were collected both in the higher saline western sites and the more brackish to fresh water eastern sites such as the San Joaquin River at Twitchell Island and the Sacramento River above Point Sacramento. The remaining five species, *Gammarus daiberi*, *Manayunkia speciosa*, *Limnodrilus hoffmeisteri*, *Varichaetadrilus angustipenis*, and *Corbicula fluminea*, are predominantly fresh water species and were collected at sites east of Suisun Bay.

Phytoplankton and Chlorophyll *a* Survey

Phytoplankton are small, free-floating or attached algae that can be tiny, single-celled organisms (less than 5 micrometers in diameter) or larger colonial organisms. Phytoplankton are an important source of food in the estuary for zooplankton, invertebrates, and some species of fish. Phytoplankton biomass is an indicator of the status of primary productivity in the estuary. Chlorophyll *a* is one of the main groups of pigments contained in the algal species that make up phytoplankton.

Monthly sampling of chlorophyll *a* concentrations and phytoplankton was conducted in 2011 by DWR's Bay-Delta Monitoring Branch at 13 stations throughout the upper San Francisco Estuary:

- Sacramento River at Greene's Landing/Hood and above Point Sacramento;
- San Joaquin River at Vernalis, Buckley Cove, and Potato Point;
- Old River opposite Rancho del Rio;
- Disappointment Slough near Bishop Cut;
- Frank's Tract near Russo's Landing;
- Suisun Bay at Bulls Head Point near Martinez and off Middle Point near Nichols;

- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Chlorophyll *a* concentration was measured at the 13 monitoring stations to estimate overall phytoplankton biomass in the estuary. Phytoplankton samples were collected and analyzed separately to determine which species were present in the estuary.

Monthly chlorophyll *a* concentrations throughout much of the estuary were relatively low. Of the 156 samples taken in 2011, 98.1 percent (153 samples) had chlorophyll *a* levels below 10 micrograms per liter ($\mu\text{g/L}$). Chlorophyll *a* levels below 10 $\mu\text{g/L}$ are considered limiting for zooplankton growth. Of the three samples with chlorophyll *a* concentrations above 10 $\mu\text{g/L}$, all were from two stations on the San Joaquin River during the summer months (Buckley Cove in July and Vernalis in July and August). The mean chlorophyll *a* concentration for all samples in 2011 was 3.22 $\mu\text{g/L}$; the median value was 2.26 $\mu\text{g/L}$. The mean was similar in 2010 (3.21 $\mu\text{g/L}$), but the median was lower (1.72 $\mu\text{g/L}$). The maximum chlorophyll *a* concentration in 2011 was 18.20 $\mu\text{g/L}$, recorded in July on the San Joaquin River at Buckley Cove. It was much lower than the maximum in 2010 (59.20 $\mu\text{g/L}$). The minimum chlorophyll *a* concentration was 0.35 $\mu\text{g/L}$, recorded in January on Old River opposite Rancho del Rio.

Phytoplankton biomass and resulting chlorophyll *a* concentrations in some areas of the estuary may be influenced by extensive filtration of the water column by the introduced Asian clam, *Potamocorbula amurensis*. Well-established benthic populations of *P. amurensis* in Suisun and San Pablo bays are thought to have contributed to the low chlorophyll *a* concentrations (and increased water clarity)

measured in these westerly bays since the mid-1980s.

In addition to monitoring for chlorophyll *a*, water samples were analyzed for pheophytin *a*.

Pheophytin *a* is a primary degradation product of chlorophyll *a*, and its relative concentration is useful for estimating the general physiological state of phytoplankton populations. When phytoplankton are actively growing, the concentrations of pheophytin *a* are normally expected to be low in relation to chlorophyll *a*. The mean pheophytin *a* concentration for all samples in 2011 was 1.30 $\mu\text{g/L}$, and the median value was 0.99 $\mu\text{g/L}$. The maximum pheophytin *a* concentration was 7.24 $\mu\text{g/L}$, recorded on the San Joaquin River at Vernalis in August. The minimum pheophytin *a* concentration was 0.16 $\mu\text{g/L}$, recorded in Grizzly Bay at Dolphin near Suisun Slough in December.

Cyanobacteria, centric diatoms, pennate diatoms, cryptomonads, and haptophytes constituted 99.4 percent of the organisms collected of the 12 groups identified.

All organisms collected in 2011 fell into these 12 categories (in order of abundance):

- (1) cyanobacteria (class Cyanophyceae);
- (2) centric diatoms (class Coscinodiscophyceae);
- (3) pennate diatoms (classes Bacillariophyceae and Fragilariophyceae);
- (4) cryptomonad flagellates (class Cryptophyceae);
- (5) haptophyte flagellates (class Prymnesiophyceae);
- (6) green algae (classes Chlorophyceae, Ulvophyceae, and Zygnematophyceae);
- (7) dinoflagellates (class Dinophyceae);
- (8) euglenoid flagellates (class Euglenophyceae);

- (9) chrysophyte flagellates (class Chrysophyceae);
- (10) ciliates (classes Kinetofragminophora and Spirotrichea);
- (11) little green algal balls (class unknown); and
- (12) kathablepharids (class Cryptophycophyta incertae sedis).

The 10 most common genera collected in 2011 were:

- (1) *Anabaena* (cyanobacterium; class Cyanophyceae);
- (2) *Aphanizomenon* (cyanobacterium; class Cyanophyceae);
- (3) *Cyclotella* (centric diatom; class Coscinodiscophyceae);
- (4) *Fragilaria* (pennate diatom; class Fragilariophyceae);
- (5) *Chroomonas* (cryptomonad flagellate; class Cryptophyceae);
- (6) *Aulacoseira* (centric diatom; class Coscinodiscophyceae);
- (7) *Cocconeis* (pennate diatom; class Bacillariophyceae);
- (8) *Cryptomonas* (cryptomonad flagellate; class Cryptophyceae);
- (9) *Pseudanabaena* (cyanobacterium; class Cyanophyceae); and
- (10) *Melosira* (centric diatom; class Coscinodiscophyceae).

Of particular note is the occurrence of a fall diatom bloom in many parts of the estuary that lasted several weeks. Fall blooms such as this one have not been seen since the early 1980s. Much of the discrete sampling was completed before the bloom began in mid-October, but it was detected at Disappointment Slough near Bishop Cut that month. The bloom lasted long enough to be detected in the November discrete sampling, and it was seen at several stations: the Sacramento River above Point Sacramento, Frank's Tract near Russo's Landing, the San Joaquin River at Potato

Point, Old River opposite Rancho del Rio, Disappointment Slough near Bishop Cut, and San Pablo Bay near Pinole Point and the mouth of the Petaluma River. The genus of diatom responsible for the bloom was *Aulacoseira sp.*, with a closely related genus (*Melosira sp.*) co-occurring at the Sacramento River above Point Sacramento.

Activities Outside the Delta

Routine SWP water quality monitoring activities, as well as special studies, are conducted outside the Delta. The special studies are in response to increasingly stringent regulations facing water purveyors who rely on DWR to deliver high-quality raw water. Most of these special studies were initiated because of fish and wildlife and water quality concerns held by agencies that provide domestic water service.

Water Quality Monitoring in the SWP

DWR's Division of Operations and Maintenance (O&M) monitors water quality throughout the SWP at more than 40 stations and analyzes more than 200 different chemical, biological, and physical constituents. O&M operates water quality monitoring stations at SWP storage and conveyance facilities located throughout the State, ranging from the Feather River watershed in the north to Lake Perris in the south. Conveyance facilities include the Oroville Facilities, California Aqueduct with the East and West Branches, North Bay Aqueduct, South Bay Aqueduct, and the San Luis Joint-Use Complex. O&M collects and analyzes samples monthly at most stations; however, sampling frequency may vary from weekly to annually depending on location, time of year, or special events. O&M delivers the water samples to DWR's Bryte Chemical Laboratory in West Sacramento for processing and analysis. Constituents analyzed include: dissolved solids; nutrients; minerals such as chloride, sulfate, and

sodium; trace elements; herbicides; pesticides; and organic substances.

O&M's water quality monitoring program also uses a network of 16 automated monitoring stations at key locations along the SWP. This network provides real-time data by continuously monitoring a variety of physicochemical parameters such as conductivity, turbidity, pH, UV₂₅₄ (254 nanometer ultraviolet absorbance; measures dissolved organic carbon [DOC]), and algal fluorescence. SWP water contractors rely on this essential data to assure safe drinking water.

O&M's water quality monitoring program is an integral component of SWP operations. O&M uses the data generated to assess water quality changes in the SWP, short- and long-term trends, and impacts from emergencies such as spills and pipe ruptures. O&M also uses the data to influence operations and hydrology, and to determine the general suitability of water for drinking as defined by public health protection standards. The findings are periodically assessed and disseminated through a variety of media including memos, network postings, conference calls, and email distribution. O&M periodically conducts special studies to investigate the impacts of specific incidents affecting SWP water quality. The special studies include groundwater turn-ins, floodwater inflows, hydrology, and Delta hydrodynamics. O&M posts a number of reports on DWR's website.

In 2011, overall SWP water quality constituent values were within historical ranges. Table 4-1 shows mean water quality for several sampling stations around the SWP and one station on the CVP's Delta-Mendota Canal. Average specific conductance (measured as EC) ranged from 79 microsiemens per centimeter ($\mu\text{S}/\text{cm}$) at Thermalito to 357 $\mu\text{S}/\text{cm}$ at North Bay Aqueduct. EC concentrations averaged between 229 to 320 $\mu\text{S}/\text{cm}$ in the California

Aqueduct and Delta-Mendota Canal. DOC was highest at the North Bay Aqueduct, at 7.1 mg/L, while concentrations in the California Aqueduct ranged from 2.4 to 4.2 mg/L. North Bay Aqueduct water exhibited higher levels of turbidity (an average of 24 NTU [nephelometric turbidity units]) compared to other locations. Water quality in the Oroville Facilities only recorded nondetectable to low levels of minerals, nutrients, and most minor elements. Alkalinity, specific conductance, and total dissolved solids concentrations in the Oroville facilities at Thermalito Afterbay averaged 37 mg/L, 79 $\mu\text{S}/\text{cm}$, and 48 mg/L, respectively.

O&M sampled for pesticides, herbicides, and insecticides in March, June, and September 2011 (see Table 4-2). Analyses of these organic compounds provided information on potential SWP exposure to contaminants. Staff detected low concentrations of the organophosphate insecticide chlorpyrifos (used to control foliage and soil-borne insect pests on a variety of food and feed crops) and the pesticides diuron, metolachlor, and simazine at the North Bay Aqueduct, Delta-Mendota Canal, Banks Pumping Plant, Check 13, Check 21, Check 29, Check 41, Devil Canyon, and Devil Canyon 2nd Afterbay.

Of the four detected organic chemicals, diuron had the highest concentration of 6.2 $\mu\text{g}/\text{L}$, followed by metolachlor, simazine, and chlorpyrifos with 0.3 $\mu\text{g}/\text{L}$, 0.07 $\mu\text{g}/\text{L}$ and 0.05 $\mu\text{g}/\text{L}$, respectively. The concentrations of the detected organic chemicals ranged from 0.02 to 0.62 $\mu\text{g}/\text{L}$.

Groundwater Turn-ins

Groundwater turn-ins to the California Aqueduct are authorized during periods of drought or reduced SWP allocations. SWP water contractors or other participants of an approved program convey groundwater into the California Aqueduct at various

Table 4-1 Mean Water Quality at Selected SWP Grab Sample Locations^a in 2011

Constituent	Units ^b	Reporting Limit	California Aqueduct									
			Thermalito Afterbay at Outlet	North Bay Aqueduct, Barker Slough Pumping Plant	Delta-Mendota Canal Upstream of McCabe Road	Banks Pumping Plant	O'Neill Forebay Outlet (Check 13)	Kettleman City (Check 21)	Near Highway 119 (Check 29)	Tehachapi Afterbay (Check 41)	Devil Canyon Headworks	Devil Canyon 2nd Afterbay ^d
Alkalinity	mg/L as CaCO ₃	1	37	111	51	50	53	52	52	60	54	
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	NR	NR	
Arsenic	mg/L	0.001	<0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.05	<0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Bromide	mg/L	0.01	<0.01	0.05	0.07	0.07	0.07	0.08	0.07	0.15	0.07	
Calcium	mg/L	0.1	8	17	14	14	13	14	14	17	14	
Chloride	mg/L	1	<1	28	31	25	25	29	28	49	27	
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	mg/L	0.001	<0.001	0.002	0.001	0.001	0.001	0.002	0.002	0.002	0.002	
Hardness	mg/L as CaCO ₃	1	34	105	64	60	66	66	66	78	64	
Iron	mg/L	0.005	0.008	0.063	0.027	0.030	0.030	0.015	0.015	0.036	0.011	
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium	mg/L	0.1	3.4	15.3	7.2	6.9	6.9	7.3	7.4	9	6.9	
Manganese	mg/L	0.005	<0.005	0.037	<0.005	0.016	0.016	<0.005	<0.005	0.912	<0.005	
Nitrite + Nitrate	mg/L as N	0.01	<0.01	0.14	0.50	0.34	0.34	0.44	0.42	0.50	0.30	
Organic Carbon, Dissolved	mg/L as C	0.5	NR	7.1	2.9	2.8	2.8	2.9	3.0	4.2	2.4	
Organic Carbon, Total	mg/L as C	0.5	NR	7.8	3.0	3.0	3.0	3.0	3.0	4.5	2.4	
Phosphate-Ortho	mg/L as P	0.01	<0.01	0.15	0.06	0.04	0.04	0.06	NR	0.05	0.05	
Phosphorus-Total	mg/L	0.01	<0.01	0.28	0.10	0.08	0.08	0.09	0.09	0.10	0.07	
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	
Sodium	mg/L	1	3	33	25	22	22	25	25	33	24	
Specific Conductance	µS/cm	1	79	357	261	229	229	254	247	320	251	
Sulfate	mg/L	1	2	24	23	20	20	24	22	27	21	
Total Dissolved Solids	mg/L	1	48	202	147	130	130	146	141	203	139	
Turbidity	NTU	1	3	24	11	7	7	8	8	6	2	
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	

^a A grab sample is a single sample chosen to represent the conditions in a given matrix (usually natural water) at a specific location, depth, and time. All reported constituents are the yearly mean of laboratory analytical values sampled monthly from January through December. The yearly mean may be based upon one to twelve samples for the list of constituents.

^b mg/L = milligrams per liter; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity unit; NR = No data recorded at this location.

^c Devil Canyon Headworks, KA041134 was the sampling site during the period of January through March 2011, and the reported values are the means of those three months.

^d Devil Canyon 2nd Afterbay, KA041323 was the sampling site during the period of April through December 2011, and the reported values are the means of those nine months.

Table 4-2 Pesticides, Herbicides, and Other Organic Substances Detected in the SWP in 2011

Sampling Location ^a	Sampling Station ID Number	Sample Date	Chemical Detected ^b	Concentration (µg/L) ^c
North Bay Aqueduct, Barker Slough Pumping Plant	KG000000	6/15/11	Metolachlor	0.3
Delta-Mendota Canal upstream of McCabe Road	DMC06716	3/16/11	Diuron	0.4
			Simazine	0.02
		6/14/11	Chlorpyrifos	0.05
Banks Pumping Plant	KA000331	3/16/11	Diuron	0.33
			Simazine	0.06
		6/15/11	Metolachlor	0.1
O'Neill Forebay Outlet (California Aqueduct at Check 13)	KA007089	3/16/11	Simazine	0.04
			Diuron	0.36
		6/14/11	Simazine	0.07
California Aqueduct near Kettleman City (Check 21)	KA017226	3/15/11	Simazine	0.03
			Diuron	0.3
		6/14/11	Metolachlor	0.1
California Aqueduct near Highway 119 (Check 29)	KA024454	3/14/11	Diuron	0.35
			Simazine	0.02
		6/14/11	Metolachlor	0.1
California Aqueduct at Tehachapi Afterbay (Check 41)	KA030341	3/16/11	Diuron	0.32
			Simazine	0.03
		6/14/11	Metolachlor	0.1
California Aqueduct at Devil Canyon Headworks	KA041134	3/16/11	Simazine	0.03
			Diuron	0.62
Devil Canyon 2nd Afterbay	KA041323	6/15/11	Simazine	0.02

^a Water at these locations was sampled during March, June, and September.

^b Only chemicals found in detectable amounts at the sampling stations are included in this table. No chemicals were detected in September. Refer to the document entitled *Analytical Methods for Organic Chemicals* for a complete listing of all organic chemicals included in the laboratory analysis. The document is available online on DWR's website.

^c µg/L = micrograms per liter.

locations. This water may be used for local redistribution or transfer to other water contractors. Groundwater turn-ins are allowed provided they do not result in the degradation of SWP water quality, cause toxicity to fish and wildlife, or adversely affect beneficial uses.

In 2001, DWR established interim two-tiered criteria for reviewing the water quality of groundwater turn-ins. Tier 1 programs have a "no adverse impact" criterion and are tied to historical water quality levels in California. Programs meeting Tier 1 criteria are generally approved by DWR without referral to the State Water Contractor Facilitation Group. Tier 2 programs involve

water quality levels that exceed the historical water quality in the California Aqueduct and have the potential to cause adverse impacts to the SWP water contractors. Tier 2 programs are referred to the State Water Contractor Facilitation Group for review and recommendations to DWR. DWR considers all factors before making a decision on a proposed groundwater turn-in program.

During 2011, approximately 69,000 acre-feet (af) of groundwater was pumped into the California Aqueduct. The majority of the groundwater turn-ins was from Tier 2 sources in the south San Joaquin Valley (San Joaquin Field Division). The sources were Kern Water Bank Authority (29,041 af), Cross Valley Canal (23,759 af), and Arvin-Edison Water Storage District (16,065 af). The groundwater pumped into the aqueduct did not degrade SWP water quality.

Additional SWP water quality data are available on DWR's website.

Non-project Floodwater Inflows

In 2011, floodwater inflows into the California Aqueduct occurred from January 2011 to June 2011, totaling 7,855 af. Floodwater inflows into the California Aqueduct from the Cantua Creek watershed can affect California Aqueduct water quality because the floodwater can deposit sediments, asbestos, and trace elements such as selenium. These elements naturally exist in the rugged terrain of this watershed and have been documented to cause water quality degradation in downstream areas. However, the floodwater inflow volumes in 2011 were very small compared to the California Aqueduct flow volumes for the specified months.

Municipal Water Quality Program Branch

The Sacramento-San Joaquin Delta provides drinking water for more than 25 million

people in California. The Division of Environmental Services, Municipal Water Quality Program (MWQP) is responsible for evaluating the suitability of Delta water as a drinking water source, identifying sources of water quality degradation, and ensuring water quality data meet quality assurance and quality control objectives. The MWQP Branch includes the Municipal Water Quality Investigations (MWQI) Program (MWQI Section, Field Support Section, Water Quality Special Studies Section, Real Time Data and Forecasting Comprehensive Program) and the Quality Assurance/Quality Control (QA/QC) Section.

The mission of the MWQI Program is to:

- support the effective and efficient use of the SWP as a source water supply used for municipal purposes through monitoring, forecasting, and reporting SWP water quality;
- provide early warning of changing conditions in source water quality used for municipal purposes;
- provide data and knowledge-based support for operational decision-making on the SWP;
- conduct scientific studies of importance to drinking water; and
- provide scientific support to DWR, the State Water Project Contractors Authority-MWQI Specific Project Committee, CALFED, and other governmental entities.

Real Time Data and Forecasting Comprehensive Program

The Real Time Data and Forecasting Comprehensive Program (RTDF-CP) has become a central element of the MWQP. The goal of the program is to further develop the capability for real-time data and forecasting of short- and long-term source drinking water quality conditions in the Delta and

SWP. Within the MWQP, the RTDF-CP entails the following elements:

- real-time monitoring conducted at key locations, providing stakeholders and interested parties with timely data;
- field operations that ensure proper operation of all automated sampling equipment;
- consistent modeling with continuous updates providing the best forecasts possible;
- QA/QC of the instruments and data; and
- centralized information management and dissemination.

The real-time monitoring network now includes stations located at Banks Pumping Plant, Jones Pumping Plant, the Sacramento River at Hood, and the San Joaquin River near Vernalis (McCune Station). MWQP is constructing a fifth station at the Gianelli Pumping-Generating Plant at San Luis Reservoir.

The RTDF-CP worked with several other agencies to develop a Delta spill early-warning model and alert system. This enables Delta water users to receive early warning of spills or sewage overflows, estimating concentration and arrival time.

Quality Assurance/Quality Control

The QA/QC Program was established by Water Resources Engineering Memorandum No. 60 in 1992 to ensure that data generated by DWR's environmental monitoring programs meet high quality standards and are scientifically defensible. This is accomplished by encouraging monitoring programs to follow standardized procedures including quality control measurements in their sampling protocols.

The program performs the following functions:

- procures specialized products and services from outside sources on an as-needed basis, which may include obtaining certified laboratory standards and outside instructors for teaching technical classes;
- publishes QA/QC guidance documents;
- develops and maintains the drinking water quality database and associated quality control metadata as part of the DWR Water Data Library; and
- assists departmental programs with developing QA project plans.

The QA/QC Program, with assistance from California State University, Sacramento, presented a class open to all DWR staff titled, "Quality Assurance for Water Quality Monitoring," on April 27–28, 2011. The class was aimed at project managers and field technicians involved in planning and conducting field water quality monitoring activities. The class provided tools and resources to integrate QA/QC procedures into a project's planning and data collection processes as required under Water Resources Engineering Memorandum No. 60.

QA/QC staff assisted the MWQP in finalizing QA project plans for two projects that evaluated impacts of the main regional wastewater treatment plants on water quality in the Delta. Samples were collected at the outfalls of the Sacramento Regional County Sanitation District and the City of Stockton Regional Wastewater Control Facility and were analyzed for nitrosamine precursors, which are emerging contaminants of concern, and also for pathogenic protozoa (*Cryptosporidium* and *Giardia*) that can cause serious human infections. QA project plans provide formal procedures for planning and conducting a water quality sampling project to document that QC protocols have been followed.

QA/QC staff continued improving the Field and Laboratory Information System, a database that provides a systematic way of collecting and storing QC metadata for DWR's environmental sampling programs and also monitors and stores analytical results within DWR's Bryte Chemical Laboratory. In 2011, staff consolidated field modules of the Field and Laboratory Information System that previously stored data at DWR's field offices into a single departmentwide, centralized database located at headquarters. This has reduced maintenance costs and improved QC data integrity.

Water Quality Special Studies

Special studies are conducted to investigate the origins, fate, transport, and in some cases loads of current and emerging contaminants of concern. Such studies help determine where new instruments should be located. Special studies can also be used to:

- investigate seasonal patterns and trends of constituents or examine circulation patterns of contaminants;
- refine modeling assumptions; and
- assess the impacts of increasing urbanization on levels of water quality constituents of concern.

MWQI engages in special studies that focus on specific aspects of source waters, contaminant loading, measurement methods and instrumentation, and climate and hydrology. The following studies were in progress during the 2011 calendar year:

- Urban Sources and Loads Investigation of Lathrop, California;
- Nitrosamines, their Precursors, and *Cryptosporidium*/*Giardia* Occurrence from Waste Water Treatment Plant Facilities in the Delta;
- investigation of O'Neill Forebay water circulation;

- investigation of constituent dispersion and travel time in the SWP;
- monitoring of the upstream Sacramento River for the Systech Watershed Analysis Risk Management Framework model;
- spectrofluorometer study;
- feasibility study for portable water quality monitoring station;
- MWQI Program Summary Report; and
- 2006–2010 State Water Project Sanitary Survey Update.

Accomplishments for the 2010–2011 MWQI Work Plan

During the 2010–2011 work plan cycle, the MWQI accomplished the following goals:

- continued improvements to the RTDF-CP website, which provides real-time, near real-time, and forecasted water quality data;
- implementation of the Delta Simulation Model 2 (DSM2) Aqueduct Extension Model of the SWP (Aqueduct Model) to provide seasonal forecasts;
- completion of a multiyear management plan for the forecasting component of the RTDF-CP;
- completion of DOC sampling for the DSM2 boundary improvement/model calibration special study (the report was included in the annual modeling report published by the Bay-Delta Office, and data from this study is now being used by both DWR and outside consultants on various modeling studies);
- installation of a Metrohm anion analyzer at the Jones Pumping Plant (publication of data to the California Data Exchange Center began in March 2011); and
- production of several projects to develop data for simulation of historical conditions for the Delta and Aqueduct models, including assembling, synthesizing, and refining EC, DOC, and bromide data necessary to define boundary conditions. These projects are

part of a large RTDF-CP water quality forecast project involving the Bay-Delta Office and SWP Operations Control Office.

The study report and other MWQP publications can be found on DWR's website.

Bryte Chemical Laboratory

Established in 1951, Bryte Chemical Laboratory is DWR's primary analytical laboratory. Its main function is to analyze drinking, surface, waste, and ground water for the various water quality programs within DWR. Since 1990, the laboratory has been certified biannually by the CDPH Environmental Laboratory Accreditation Program to perform water quality analyses following U.S. Environmental Protection Agency (EPA) or American Water Works Association procedures and analytical methods. This certification allows the laboratory to perform analyses for regulatory work that can be used for compliance purposes. The laboratory continues to perform the vast majority of chemical and other related analyses required to support DWR's water quality programs. Each year, thousands of water samples are routinely analyzed for inorganic and organic constituents such as standard minerals, cations, anions, nutrients, metals, chlorophyll, pesticides, herbicides, and volatile organic compounds.

In 2011, the laboratory upgraded its capability and capacity to detect and analyze cations (sodium, calcium, potassium, magnesium, boron, and silica) following EPA Method 200.7 with the purchase of a PerkinElmer Optima 8300 inductively coupled plasma optical spectrophotometer. The spectrophotometer is a fully automated and computer-controlled instrument equipped with new, technologically advanced optics and two solid-state, segmented-array, charge-coupled device detectors that generates data that are highly stable, accurate, and reproducible.

The instrument's detection limit has been established at 1 part per million.

The laboratory has continued to manage a variety of analytical contracts with other State agencies and several outside laboratories in accordance with the master contract policy approved in fiscal year 1994–1995. These contracts are used to perform analyses that are beyond the capability and capacity of the laboratory, such as solids and fish tissues. The laboratory works in conjunction with DWR's MWQP QA/QC Section to replace these contracts as they expire each fiscal year. On September 29, 2011, Weck Laboratories, Inc. was awarded the contract for water analysis worth \$1.5 million over 3 years.

SWP security and protection has continued to be a primary goal for DWR since September 11, 2001. To help protect the SWP from biochemical and chemical agents, the laboratory continues to be an active member in a group of laboratories called the California Association of Mutual Aid Laboratories Network (CAMAL Net) headed by CDPH. The laboratory network's main objective is to voluntarily assist CDPH in the analysis of chemical agents in water quality samples should a natural disaster or biochemical or chemical event occur in California. The assistance is only required should the analytical capacity of CDPH be exceeded or to confirm the presence or absence of chemical agents in water quality samples provided by CDPH. In 2007, Bryte Chemical Laboratory was classified as a Level II participating laboratory in the CAMAL Net organization. Level II only allows the laboratory to receive samples that are prescreened and determined nonhazardous to laboratory personnel.

Suisun Marsh Activities

Suisun Marsh consists of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and

sloughs. It is the largest contiguous brackish marsh remaining in the United States. Situated in southern Solano County, west of the Sacramento-San Joaquin Delta and north of Suisun Bay, the marsh encompasses more than 10 percent of California's remaining natural wetlands. The marsh is the resting and feeding ground for thousands of waterfowl and shorebirds migrating on the Pacific Flyway. It provides important habitat for more than 221 bird species, 45 mammal species, 16 reptile and amphibian species, and more than 40 fish species.

DWR became intricately involved in the Suisun Marsh in response to SWRCB Water Right Decision 1485, which required mitigation for effects of the SWP and CVP. The 1984 *Plan of Protection for Suisun Marsh*, completed by DWR, included a series of facilities to distribute lower salinity water to managed wetlands and monitoring in relation to these facilities. Today, DWR operates and maintains DWR/Reclamation water management facilities, including the Roaring River Slough Distribution System (RRSDS), Morrow Island Distribution System (MIDS), Goodyear Slough Outfall, and the Suisun Marsh Salinity Control Gates (SMSCG). Figure 4-2 shows the water quality compliance and monitoring sampling locations and the water management facilities.

Through agreements and plans, DWR has been working in coordination with Reclamation, DFW, Suisun Resource Conservation District (SRCD), USFWS, and other agencies on habitat management, preservation, and restoration of the Suisun Marsh.

Revised Suisun Marsh Preservation Agreement

In 1987, DWR, Reclamation, DFW, and SRCD signed the *Suisun Marsh Preservation Agreement* (SMPA). It required Reclamation and DWR to meet salinity standards as

specified in the then-current SWRCB Water Right Decision 1485, set a timeline for implementing the *Plan of Protection for the Suisun Marsh*, and delineated monitoring and mitigation requirements. A revised SMPA and *Revised Mitigation and Monitoring Agreement* were signed in 2005 to make channel water salinity requirements consistent with D-1641. These included management activities in lieu of western marsh facilities proposed in the plan of protection.

The revised SMPA included the following actions: operate facilities in order to meet channel water salinity standards consistent with D-1641; implement a Water Manager Program; provide portable pumps; update Individual Ownership Adaptive Management Habitat Plans; establish a Drought Response Fund; and replace turnouts on the RRSDS. The monitoring agreement included monitoring for fish, the salt marsh harvest mouse, vegetation, and other biological monitoring.

During 2011, DWR, DFW, Reclamation, and SRCD continued to implement these activities.

Operation and Maintenance *Morrow Island Distribution System Fish Screen and Alternatives*

MIDS is an interior ditch bordered by levees that was created to distribute water to managed wetlands. Water with relatively lower salinity is taken from Goodyear Slough in the west through water control structures that transport the water into MIDS. Water is then distributed to managed wetlands through private landowner water control structures along the ditch. Water not used by the landowners exits into Grizzly Bay through water control structures in the east.

Based on previous study results, a fish screen at MIDS would likely have negligible benefits to sensitive fish populations (see

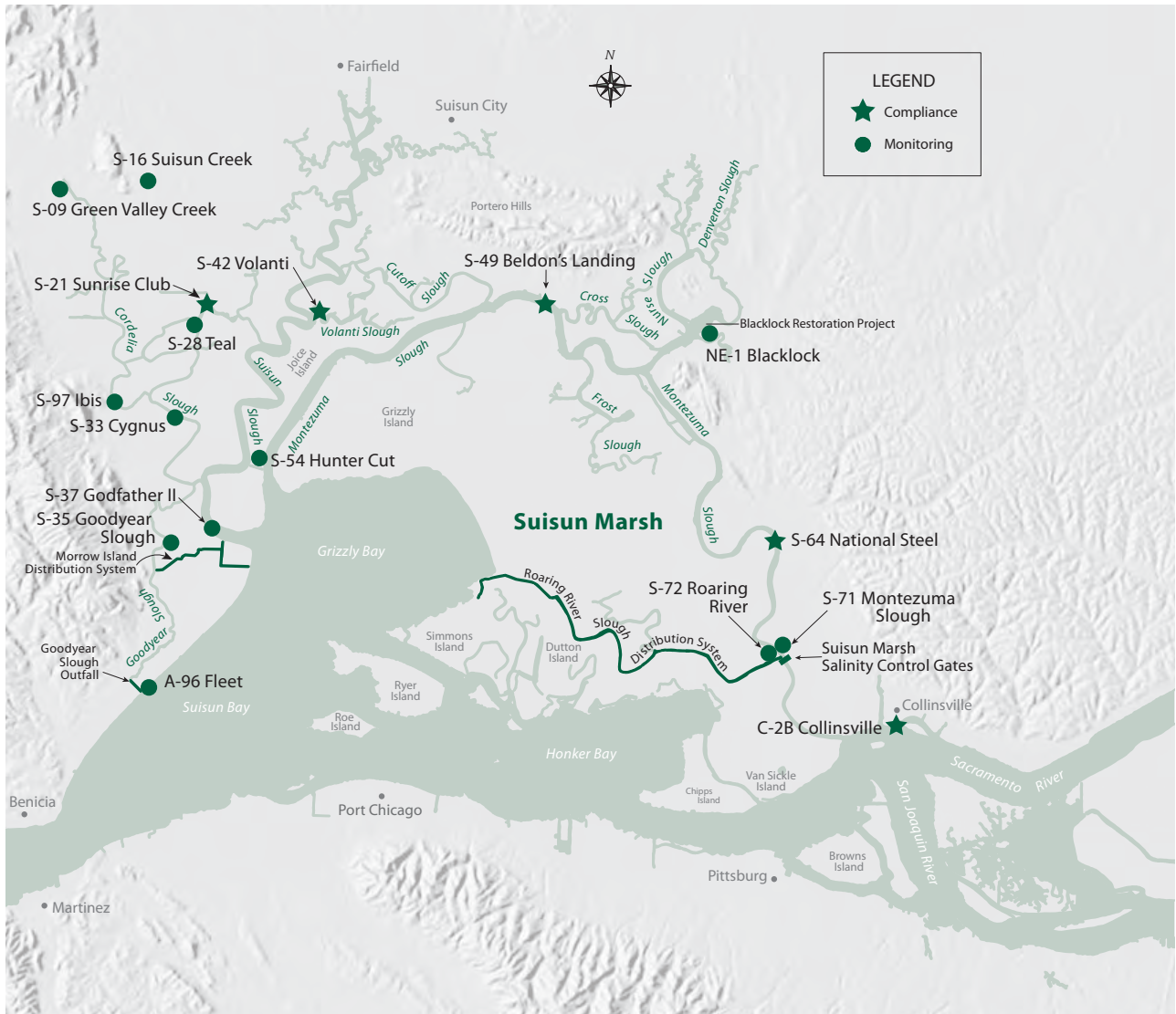


Figure 4-2 Compliance and Monitoring Stations and Water Management Facilities in the Suisun Marsh

Bulletin 132-07, Chapter 4, Water Quality). DWR and Reclamation are proposing to fulfill the outstanding terms and conditions of the USFWS 1997 BO for the MIDS maintenance project by acquiring and protecting, in perpetuity, aquatic habitat in Suisun Marsh. (For additional information about the BO, see Bulletin 132-08.) The status of this proposal remains on-going without new notable developments or changes.

On February 23, 2009, DFW issued an incidental take permit for the on-going and

long-term operation of existing SWP facilities in the Sacramento-San Joaquin Delta for the protection of Longfin Smelt. MIDS is included as one of these facilities.

To minimize the take of Longfin Smelt at the MIDS diversion, DFW specifies the average intake velocities each year in order to adequately protect these fish.

Also, as a requirement of the incidental take permit, DWR is developing a study to confirm that the aforementioned operation prevents

or substantially reduces the entrainment of Longfin Smelt at MIDS.

Suisun Marsh Salinity Control Gates

The SMSCG are operated as needed to meet salinity standards. When they are not in operation, they are placed in an open position to minimize fish concerns related to predation and impedance. In the past, installation or removal of the flashboards and operation of the gates has varied due to salinity conditions, fisheries agencies' requests for sensitive species concerns, or special studies and repairs.

Status of SMSCG in 2010–2011. During the control season (October 2010 through May 2011), the flashboards were installed October 12, 2010, with the three radial gates in the open position and the boat lock gates open as required in the National Marine Fisheries Service agreement for fish passage. The SMSCG were tidally operated between November 16 and December 7, 2010, due to salinity concerns in the marsh. On start-up on November 16, only gate number 1 started operating remotely. Gates number 2 and number 3 experienced electrical problems and stayed in the open position until November 25 when they were closed. Gate number 2 became operational on November 30. Gate number 3 remained closed until repaired on February 2, 2011, when it was set in the open position. Due to high outflows in December, gate operations were suspended on December 8, 2010. Salinity levels continued to stay low in January and February, and with a series of storm events in March, salinity levels decreased well below the monthly standards for April and May. The flashboards were removed on May 18, 2011. In 2011, two of the boat lock gates were refurbished.

Other Facility Operation and Maintenance

The RRSDS and Goodyear Slough Outfall were operated and maintained as needed

to provide lower salinity water to managed wetland properties.

Water Quality and Compliance

Salinity levels for the 2010–2011 control season were below monthly standards for all five compliance stations.

Details of salinity levels in the marsh are available in the monthly report entitled, *Suisun Marsh Monitoring Program Channel Water Salinity Report*, available on DWR's website.

Blacklock Tidal Marsh Restoration Project

DWR received CALFED Ecosystem Restoration Program grant funds in 2001 to acquire the 70-acre Blacklock property in December 2003. DWR, in cooperation with Reclamation, DFW, USFWS, and SRCD, implemented the Blacklock Restoration Project (location shown on Figure 4-2). This project restored diked, managed wetlands to tidal wetlands. Although a natural breach in the levee occurred in July 2006, it was determined that the planned breach should still be constructed to allow for full tidal flow and optimum sediment transportation. The planned breach construction occurred on October 3 and 4, 2006.

The project goals and objectives are to:

- restore the area to a fully functioning, self-sustaining marsh ecosystem created through restoration of natural hydrologic, sedimentation, and biological processes;
- increase the area and contiguity of emergent wetlands providing habitat for tidal marsh species; and
- assist in the recovery of at-risk species.

The final restoration plan for the project was published in June 2007.

In 2011, DWR continued implementing the 10-year monitoring program at the Blacklock site. Monitoring is performed in cooperation with State and federal agencies. There are 15 parameters being monitored, including sediment accretion, channel network evolution, vegetation development, water quality, methylmercury concentrations, and avian use.

For more information about the Blacklock Restoration Project, visit the Suisun Marsh Program webpage on DWR's website.

Suisun Marsh Habitat Management, Preservation, and Restoration Plan

The *Suisun Marsh Habitat Management, Preservation, and Restoration Plan*, referred to as the Suisun Marsh Plan (SMP), was developed by the Principal Agencies (or Principals), a group of agencies with primary responsibility for Suisun Marsh management. The SMP is intended to balance the benefits of tidal wetland restoration with other habitat uses in the marsh by evaluating alternatives that provide a politically acceptable change in marshwide land uses, such as salt marsh harvest mouse habitat, managed wetlands public use, and upland habitat. It relies on the incorporation of existing science and information developed through adaptive management.

The Principals include USFWS, Reclamation, DFW, DWR, National Marine Fisheries Service, and SRCD. The Principals have consulted with other participating agencies, such as the U.S. Army Corps of Engineers, San Francisco Bay Conservation and Development Commission, the RWQCBs, and SWRCB to develop this plan.

During 2011, the SMP was completed. Representatives from the Principals met monthly to finalize actions and alternatives to be included in the SMP. The SMP environmental impact statement/environmental impact report was developed

in coordination with the recommendations of the Delta Vision Process and with information and evaluation provided by the Delta Risk Management Study and other regional programmatic processes. Reclamation and USFWS served as joint National Environmental Policy Act lead agencies, and DFW served as the California Environmental Quality Act lead agency. An adaptive management plan will be implemented as a component of the SMP. The final environmental impact statement/environmental impact report was completed in November 2011 and is available on the U.S. Department of the Interior website.

Suisun Marsh Expenditure History

Suisun Marsh expenditures and reimbursements administered by DWR for calendar years 1968 through 2011 are summarized in Table 4-3. From 1968 through December 31, 2011, DWR disbursed more than \$138.7 million of SWP funds for planning, design, environmental documentation, construction, maintenance, monitoring, mitigation, and permit compliance in support of implementing the *Plan of Protection for the Suisun Marsh* through the SMPA and for meeting standards set by SWRCB. Reclamation has reimbursed DWR approximately \$52.8 million (38 percent), and the State's General Fund has reimbursed approximately \$9.5 million (7 percent). These figures do not include up-front payments made by Reclamation for staff and other direct costs, as well as approximately \$5.7 million in Reclamation interest payments during 1988 and 1989.

Annual figures are reported in Table 4-3 for DWR's up-front payments, Reclamation reimbursements, General Fund reimbursements, and DWR's cumulative expenditure balance.

Table 4-3 Suisun Marsh Expenditures and Reimbursements Administered by DWR (in dollars), 1968–2011

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment ^a [4]	Reclamation Invoice Payment [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs ^c [8]	SWP Water Contractors' Costs [7] minus [8] [9]
1968	10,571					10,571	359	10,212
1969	34,181					34,181	1,162	33,019
1970	23,343					23,343	794	22,549
1971	1,042					1,042	35	1,007
1972	47					47	2	45
1973	0					0	0	0
1974	0					0	0	0
1975	2,709					2,709	92	2,617
1976	32,960					32,960	1,121	31,839
1977	37,475					37,475	1,274	36,201
1978	350,831					350,831	11,928	338,903
1979	3,660,099					3,660,099	124,618	3,535,481
1980	5,005,759					5,005,759	170,772	4,834,987
1981	2,964,974					2,964,974	101,311	2,863,663
1982	2,955,705			(2,500,000)		455,705	101,111	354,594
1983	2,754,094					2,754,094	93,643	2,660,451
1984	2,418,344					2,418,344	82,388	2,335,956
1985	2,332,773					2,332,773	79,432	2,253,341
1986	6,495,322					6,495,322	220,843	6,274,479
1987	13,600,701					13,600,701	462,424	13,138,277
1988	7,456,364			(17,368,725) ^b	(2,039,752)	(11,952,113)	253,516	(12,205,629)
1989	2,341,960	(9,478,000)	6,634,600	(1,219,691) ^b	(283,857)	(2,004,988)	79,643	(2,084,631)
1990	3,030,010			(695,450)		2,334,560	101,460	2,223,100
1991	6,223,042			(2,925,429)		3,297,613	210,454	3,087,159
1992	2,737,259			(1,174,655)		1,562,604	91,951	1,470,653
1993	2,979,255			(238,130)		2,741,125	99,897	2,641,228
1994	3,192,213			(1,962,549)		1,229,664	107,281	1,122,383
1995	2,721,978			(647,138)		2,074,840	91,218	1,983,622
1996	3,391,678			(1,482,396)		1,909,282	113,244	1,796,038
1997	3,634,267			(1,520,219)		2,114,048	121,132	1,992,916
1998	5,342,834			(1,107,501)		4,235,333	177,132	4,058,201
1999	8,867,742			(2,696,200)		6,171,542	301,424	5,870,118
2000	2,857,534			(3,300,053)		(442,519)	98,145	(540,665)
2001	2,623,227			(444,009)		2,179,218	89,494	2,089,724
2002	3,752,486			(791,319)		2,961,167	124,386	2,836,780
2003	3,258,583			(2,389,979)		868,604	107,566	761,038
2004	2,874,629			(952,940)		1,921,689	94,885	1,826,804
2005	3,940,875			(1,409,296)		2,531,579	130,049	2,401,530
2006	5,790,050			(868,449)		4,921,601	193,281	4,728,320
2007	4,086,170			(939,879)		3,146,291	134,850	3,011,441
2008	3,806,561			(1,670,278)		2,136,283	125,102	2,011,181
2009	4,635,327			(1,123,705)		3,511,622	152,967	3,358,655
2010	2,796,261			(1,663,530)		1,132,731	92,276	1,040,455
2011	3,696,021			(1,748,136)		1,947,885	121,969	1,825,917
Total	138,717,257	(9,478,000)	6,634,600	(52,839,656)	(2,323,609)	80,710,592	4,666,634	76,043,957

^a Under Assembly Bill 1442, the General Fund paid 20 percent of the Suisun Marsh costs through June 1988, which totaled \$9,478,000. This payment included \$2,843,400, which represents 7 percent of the costs through June 1988 paid by the General Fund. This amount has reduced the costs billed to the SWP water contractors. The remaining \$6,634,600 received from the General Fund represents DWR's recreation project purpose share of 14 percent.

^b Excludes interest payments made by Reclamation in 1988 and 1989.

^c Allocation factors for capital recreation costs have changed from 14 percent to 3.4 percent, and operations and maintenance recreation costs from 14 percent to 3.3 percent.



Chapter 5 Local Assistance

The California Irrigation Management Information System weather stations help growers and landscape managers determine when to irrigate and how much water to apply.

Significant Events in 2011

The California Irrigation Management Information System (CIMIS) made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7) and the Model Water Efficient Landscape Ordinance (MWELO).

The Recycling and Water Desalination Section contributed information for various components of SBX7 7, including assessing how to determine reasonable 2020 and 2030 targets for statewide water recycling; brackish groundwater desalination and infiltration; and direct use of urban storm water runoff.

The Department of Water Resources (DWR) continued working with the Agricultural Stakeholder Committee (ASC) to seek technical and policy input from stakeholder representatives and the public as it plans and implements the requirements for developing the Agricultural Water Measurement regulations and implementing other agricultural provisions and mandates of SBX7 7.

DWR convened an Urban Stakeholder Committee to provide guidance and input. DWR also began to develop a fourth target method and the industrial process water regulation.

Through the Integrated Regional Water Management (IRWM) Grant Program, DWR awarded \$21 million in planning grant funding, \$205 million in implementation grant funding, and \$178 million in stormwater flood management grant funding in 2011.

Information in this chapter was contributed by the Division of Statewide Integrated Water Management, the Division of Environmental Services, and the Division of Integrated Regional Water Management.

The Department of Water Resources (DWR) manages the Davis-Grunsky Act Program, water use efficiency, agricultural drainage, and Water Conservation Bond Law programs, and participates in several other programs that assist local agencies and benefit State Water Project (SWP) water contractors.

Davis-Grunsky Act Program

The Davis-Grunsky Act, authorized in 1960 as part of the Burns-Porter Act, provides construction loans for local domestic water projects and agricultural water supply. It also provides grants for recreation and fish and wildlife enhancement. Additionally, loans and grants may be given to rehabilitate dams and reservoirs.

DWR's ongoing administration of Davis-Grunsky program loans and grants includes management and oversight of 32 recreation projects and contracts. Administration costs are recovered from revenues generated by repayment of Davis-Grunsky Act loans. Recreation grant contracts are being amended to reflect modification of DWR's fee oversight functions and actual construction of recreation facilities.

The Davis-Grunsky Act requires participating State agencies to operate and maintain the recreation projects, while DWR inspects the recreation facilities, monitors the recreation contracts, and maintains a list of the recreation projects.

Water Use Efficiency

The Water Use and Efficiency Branch in the Division of Statewide Integrated Water Management activities include providing technical assistance to local agencies; managing water use efficiency financial assistance programs; managing the California Irrigation Management Information System (CIMIS); reviewing,

tracking, and reporting on urban and agricultural water management plans; and managing drainage and water recycling/desalination projects.

California Irrigation Management Information System

CIMIS is a network of automated weather stations that collects weather data and transmits it to a central repository in Sacramento. After performing quality control and calculations, data are made available to the public for such diverse purposes as irrigation scheduling, resource planning, research, and modeling.

In 2011, DWR's CIMIS network collected data from 145 stations, with approximately 58 percent of the stations on the network belonging to local cooperators. The demand for CIMIS data has been increasing steadily since its establishment in 1982. In 2011, the number of registered data users had grown from 661 in 1989, to more than 39,800.

Approximately 2.1 million reports were generated from the database using the CIMIS website in 2011. Thousands of reports were also retrieved from the CIMIS FTP (File Transfer Protocol) site. Users can register online, access archived data, download data files, and peruse content about the CIMIS program and other helpful metadata and information. A separate but concurrently operating database and web application is maintained for redundancy to protect the data.

CIMIS continued providing the spatially distributed reference evapotranspiration (ET₀) data, known as Spatial CIMIS, and expanded its user base through outreach activities. Spatial CIMIS is produced by coupling remotely sensed data from the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellite with point measurements from CIMIS stations to estimate ET₀ data at 2-kilometer grids.

In addition to increasing the number of its stations, CIMIS made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7), and the Model Water Efficient Landscape Ordinance (MWELO). SBX7 7 requires all water suppliers to increase water use efficiency. It also requires, among other things, the development of agricultural water management plans and a 20 percent reduction in urban water consumption by the year 2020.

In 2011, CIMIS continued working on multiple projects initiated in 2010 to upgrade its hardware and software to accommodate the anticipated increase in demand for data for implementation of SBX7 7 and MWELO. When completed, these projects are expected to deliver better-quality CIMIS data more frequently, using user-friendly features.

Recycling and Water Desalination

The goal of the Division of Statewide Integrated Water Management's Recycling and Water Desalination Section is to improve water use efficiency by promoting increased use of nonconventional water sources—namely recycled water and desalinated brackish and ocean waters—through planning, technical, and financial assistance. As part of a balanced water portfolio, nonconventional water sources will help meet existing and future water supply and environmental needs. The section's

mission consists of increasing safe and beneficial use of recycled water, advancing energy-efficient treatment and desalination technologies, and encouraging economically and environmentally acceptable use of desalinated brackish and ocean waters.

In 2011, Recycling and Water Desalination Section activities included the following:

- contributing timely water recycling information for various components of SBX7 7, including assessing how to determine reasonable 2020 and 2030 targets for statewide water recycling, brackish groundwater desalination, infiltration and direct use of urban stormwater runoff, and providing desalination information;
- continuing to develop new knowledge on water recycling and desalination activities and projects in California;
- continuing to manage grant agreements for 30 of the original 48 desalination projects awarded in the first two cycles of the Proposition 50 desalination grant program. The active projects include: 11 research and development projects, 12 demonstration and pilot projects, 4 feasibility studies, and 3 construction projects;
- continuing to provide technical knowledge on water recycling and water desalination issues, including responses to questions from policymakers, regulators, State and local agencies, and the public on permitting issues; public health regulations; types, locations, and amounts of water reuse occurring; and desalinated water production and use; and
- making presentations about California's water recycling and desalination activities to DWR's visitors.

Proposition 50 Water Use Efficiency Grant Program

Proposition 50 has provided approximately \$105 million for the Water Use Efficiency grant program since 2005. The grant program provided funds for implementation of all urban best management practices and agricultural efficient water management practices (EWMPs) that would result in local, regional, and statewide benefits. The State benefits are water conservation, flow and timing, water quality, and energy, among others.

A competitive proposal solicitation package was developed for all grant cycles, along with a comprehensive review and evaluation of the project proposals. The proposal solicitation package defines project benefits, eligible projects, eligible applicants, funding caps, reporting, and other contract requirements.

In 2011, the Water Use Efficiency grant program continued to manage close to 150 grant agreements from previous proposal solicitations, the last of which was the Drought Assistance Proposal Solicitation that resulted in awarding 53 grants in the summer of 2008. Several of those grant agreements were executed after the State's "Stop Work" order was lifted in 2010.

In preparation for the release of a new round of funding targeting agricultural water use efficiency projects, \$15 million of Proposition 50 funds were reappropriated in 2011.

Agricultural Water Management Plans

SBX7 7, the Water Conservation Act of 2009 required all water suppliers to increase water use efficiency. Agricultural water suppliers are responsible for preparing, implementing, and updating agricultural water management plans, measuring the volume of water

delivered to customers, adopting a pricing structure, and implementing efficient water management practices. Agricultural water suppliers who fail to meet the specified water management planning requirements will not be eligible for water grants or loans awarded or administered by the State.

DWR and the Agricultural Water Management Council established the Agricultural Stakeholder Committee (ASC) to help DWR implement provisions of SBX7 7. Through a public process, the ASC will review technical materials and documents and provide comments, data, and supporting information to DWR. Meetings of the ASC and its subcommittees occurred throughout 2011.

SBX7 7 established the Agricultural Water Management Planning Act (California Water Code [CWC] Section 10800, et seq.) requiring an agricultural water supplier to prepare and adopt an Agricultural Water Management Plan (AWMP) on or before December 31, 2012. The agricultural water supplier is then required to update its AWMP on December 31, 2015, and every 5 years thereafter.

"Agricultural water supplier" is defined as a publicly or privately owned water supplier that provides water to 10,000 or more irrigated acres, excluding acreage that receives recycled water. An agricultural water supplier is a supplier of or contractor for water that distributes or sells water for resale. Every water supplier that becomes an agricultural water supplier after December 31, 2012, is responsible for preparing and adopting an AWMP within one year of becoming an agricultural water supplier. Agricultural water suppliers that provide water to less than 25,000 irrigated acres, excluding recycled water, are not required to adopt and implement an AWMP unless sufficient funding has specifically been provided for these purposes.

In 2011, DWR began development of a draft *Agricultural Water Management Plan Guidebook*. The guidebook will assist agricultural water suppliers in understanding and complying with the requirements of SBX7 7. It includes detailed information about preparing and submitting an AWMP to DWR.

SBX7 7 requires DWR (in consultation with the State Water Resources Control Board [SWRCB]) to promote implementation of regional water resources management practices through increased incentives and removal of barriers, consistent with State and federal law. It allows potential for revisions to the requirements for agricultural water management plans, eligibility requirements for grants and loans, permitting requirements, funding for research, and technical support.

Agricultural Water Measurement Regulation

SBX7 7 identified two critical efficient management practices that agricultural water suppliers are required to implement: measure the volume of water delivered to customers with sufficient accuracy to comply with CWC Section 531.10(a), and adopt a pricing structure based at least in part on quantity delivered. It also specified numerous additional efficient management practices for agricultural water suppliers to consider for implementation.

SBX7 7 requires DWR to adopt regulations that specify options for agricultural water suppliers to comply with the water measurement requirement in CWC Section 106083.48(b)(1). The regulations would apply to agricultural water suppliers providing water to 25,000 irrigated acres or more. Suppliers providing water to 10,000 or more irrigated acres, but less than 25,000 irrigated acres are also subject to these regulations, if sufficient funding is provided for that purpose as stated in CWC Section 10853.

Agricultural water suppliers that are subject to the regulations must measure the volume of water pursuant to the accuracy standards defined in the regulations and submit that data in the annual report (required by CWC Section 531.10[a]) summarizing aggregated farm-gate delivery data.

SBX7 7 authorized DWR to initially adopt an emergency water measurement regulation. Through the emergency rulemaking process, DWR adopted an emergency agricultural water measurement regulation that was approved by the Office of Administrative Law and became immediately effective in July 2011. DWR then began the rulemaking process for adopting a permanent agricultural water measurement regulation.

Methodology for Quantification of Efficiency of Agricultural Water Use

SBX7 7 directed DWR—in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders—to develop and report to the Legislature a proposed methodology for quantifying the efficiency of agricultural water use and a plan of implementation that includes estimated implementation costs, roles and responsibilities, and types of data that would be needed to support the methodology. DWR held numerous public meetings, stakeholder committee and subcommittee meetings, and public workshops to develop the methodology and prepare a report to the Legislature. Throughout 2011, the draft methodology was being developed, refined, and discussed with various stakeholders. The proposed methodology is intended to be used as a tool to help evaluate current conditions and plan for strategies for improving agricultural water management. The anticipated users of these methods are farmers, water suppliers, and regional water management groups, as well as nongovernmental organizations and local, State, federal, and tribal planners.

Urban Water Management Plans

SBX7 7 extended the deadline for urban water suppliers to submit urban water management plans from December 31, 2010, to August 1, 2011. DWR released the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* in March of 2011. DWR held 10 urban water management planning workshops throughout the State in February and March 2011. Water suppliers submitted 371 plans to DWR in 2011. DWR began its review of the plans. Data from the plans was entered into a new DWR Online Submittal Tool.

SBX7 7

SBX7 7, the Water Conservation Act of 2009, directed DWR to be the lead agency in implementing a number of separate actions required by the law:

- consult with the: California Urban Water Conservation Council, Agricultural Water Management Council, California Public Utilities Commission, California Department of Public Health, California Bay-Delta Authority (CBDA) or its successor agency, and the SWRCB on various parts of the legislation;
- develop regulations for commercial, industrial, and institutional (CII) process water;
- develop regulations for industrial process water;
- convene a CII Task Force and develop alternative best management practices for CII;
- develop technical methodologies and criteria for urban water suppliers to set per capita baseline, target, and compliance water use;
- develop a fourth water use target method that cumulatively could result in a statewide 20 percent reduction in urban per capita water use considering certain flexibilities;

- report to the Legislature by the end of 2016, and make recommendations on needed changes if the State is not “on track” to meet per capita targets;
- promote implementation of regional water resources management practices;
- propose new, or review and update existing, statewide targets for regional water resources management practices, including recycled water, brackish groundwater desalination and infiltration, and direct use of urban stormwater runoff.

To implement these actions through a public process, DWR convened an Urban Stakeholder Committee to provide guidance and input. DWR also began to develop the fourth target method and the industrial process water regulation.

Assembly Bill 1420 Compliance

AB 1420 (Chapter 628, Statutes of 2007) amended the Urban Water Management Planning Act (CWC Section 10610 et seq.) and was effective January 1, 2009. AB 1420 requires that the terms of, and eligibility for, any water management grant or loan made to an urban water supplier and awarded or administered by DWR, SWRCB, or the CBDA or its successor agency (collectively referred to as “funding agencies”), be conditioned on the implementation of the water demand management measures described in the urban water management plan, as determined by DWR.

Water management grants and loans include programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This funding includes, but is not limited to, funds made available pursuant to Public Resources Code Section 75026 (the Integrated Regional Water Management Program).

AB 1420 required DWR to consult with SWRCB and the CBDA in the development of eligibility requirements that consider the California Urban Water Conservation Council's best management practices and alternative approaches that provide equal or greater water savings. In 2009, AB 1420 compliance criteria were released.

Agricultural Drainage Program

The Agricultural Drainage Program's mission is to seek in-valley solutions to the surface and subsurface agricultural drainage water problems, particularly in the San Joaquin Valley, and to improve water quality in the San Joaquin River. This will be accomplished by promoting newer technologies and management practices that can reduce or eliminate off-site discharge of saline water.

The San Joaquin Valley Drainage Implementation Program has been idle since 2003. However, DWR continues to implement many of its recommendations through its Agricultural Drainage Program. DWR works in partnership with California universities (University of California and California State University), the Bureau of Reclamation (Reclamation), resource conservation districts, watershed groups, water and drainage districts, and many other local, State, and federal entities. Program activities include:

- developing, educating, and promoting the use of Integrated On-Farm Regional Drainage Management systems in the San Joaquin Valley;
- providing technical assistance and collaborating with water and drainage districts and local entities to reduce and control surface and subsurface agricultural drainage water;
- maintaining research and demonstration projects to develop drainage reuse systems, including cost-effective,

salt-tolerant crops (including energy crops); drainage treatment; disposal technologies; and salt separation and utilization;

- monitoring the quality and distribution of shallow groundwater levels in drainage-impaired areas of the San Joaquin Valley;
- promoting agricultural water and energy-use efficiency programs in drainage-impaired lands to reduce the volume of surface and subsurface drainage water and expand regional water supplies;
- maintaining programs to help improve water quality in the San Joaquin River; and
- providing grants for control of agricultural drainage water and the reduction of its toxic elements, using Propositions 50, 84, 204, and DWR project funding.

The Agricultural Drainage Program is divided into two major activities: management of Proposition 204 (the Drainage Management Subaccount) and the San Joaquin Valley Agricultural Drainage Program.

Proposition 204 (Drainage Management Subaccount)

In 1996, Proposition 204, The Safe, Clean, Reliable Water Supply Act, authorized the transfer of approximately \$6.1 million from the SWRCB to the California Department of Food and Agriculture. In 1997, the California Department of Food and Agriculture, SWRCB, and DWR signed a memorandum of understanding that established a process for utilizing the funds designated for agricultural drainage water management activities. In 1999, the California Department of Food and Agriculture and DWR signed an interagency agreement to transfer the funds to DWR for developing and implementing programs consistent with CWC Section 78645, as outlined in the memorandum of understanding. The program's goal is to develop methods of

using and concentrating salts and reducing trace element contaminants in the State's subsurface agricultural drainage water.

When bond funds are available, DWR solicits proposals from public entities seeking funding for Proposition 204 eligible activities. A technical review committee screens the proposals. DWR submits the proposal packages to an oversight committee comprised of representatives from DWR, the California Department of Food and Agriculture, and SWRCB for final approval. Ultimately, DWR is responsible for preparing and managing contracts for the approved proposals. There were no solicitations for proposals in 2011.

San Joaquin Valley Agricultural Drainage Program

This program consists of several activities, including drainage monitoring and evaluation, drainage treatment, integrated on-farm drainage management, drainage reduction and reuse, environmental services, and the San Joaquin River Water Quality Improvement Program.

Drainage Monitoring and Evaluation

Drainage monitoring and evaluation provides information on the quality, quantity, and movement of drainage water. In 2011, the following activities were conducted:

- monitoring shallow groundwater levels and flows, and collecting water quality data for drainage water from west side San Joaquin Valley tile drain sumps;
- measuring groundwater levels quarterly for approximately 200 wells in Kern County;
- preparing shallow groundwater and irrigation methods maps of drainage-impaired areas using drainage monitoring data in conjunction with land use and irrigation methods data;
- providing assistance for the collection of groundwater, soil, and operational

data for the integrated on-farm drainage management project at Red Rock Ranch (RRR) in western Fresno County; and

- maintaining a website that includes information on drainage programs and activities, salinity and shallow groundwater maps, Proposition 204 grants, and links related to other agricultural drainage programs.

Drainage Treatment

Development of Membrane Treatment of Agricultural Drainage Water. DWR continues to fund research on the use of membrane treatment for desalting agricultural drainage water under a multiyear contract with the University of California, Los Angeles (UCLA). Two reverse osmosis desalination pilot studies have been proposed.

The first study involves cooperation with UCLA to test a nanofiltration unit coupled with a reverse osmosis unit. This unit would have proprietary sensors that allow the unit to monitor and modify online operating parameters based on changing conditions of the incoming drain water. This trial will determine the operating efficiency of the unit in terms of the percent of recovery compared to the amount of time it takes for membrane fouling, and determine the electrical and chemical costs of operating the unit.

The second, a reverse osmosis research study, involves cooperation with a commercial company interested in treating water for potable use. The company intends to use a reverse osmosis unit to treat drainage water or shallow brackish groundwater. The initial goals would be similar to the UCLA reverse osmosis study, except that the commercial trial would also investigate treatment of other drainage water constituents, such as nitrate and boron.

Grassland Area Farmers: Compliance with Water Quality Control Plan. DWR continues to participate in a multiagency cooperative effort with Grassland Area Farmers and

Reclamation to comply with the objectives of the Central Valley Regional Water Quality Control Board's *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin*. One of the key components of the plan is drainage water treatment.

SWRCB approved the environmental impact report/environmental impact statement for the continuation of the *Grassland Bypass Project, 2010–2019*. The proposed actions are to:

- extend the San Luis Drain Use Agreement in order to allow the Grassland Basin Drainers time to acquire funds and develop feasible drain water treatment technology to meet revised Basin Plan objectives (amendment underway) and Waste Discharge Requirements by December 31, 2019;
- continue the separation of unusable agricultural drainage water discharged from the Grassland Drainage Area from wetland water supply conveyance channels for the period 2010–2019; and
- facilitate drainage management that maintains the viability of agriculture in the project area and promotes continuous improvement in water quality in the San Joaquin River.

Ion Exchange Pretreatment Investigations.

DWR continues to successfully operate a manually controlled ion-exchange system to “soften” agricultural drainage water. The small manually operated ion-exchange treatment system provided DWR with enough information to continue utilizing this treatment process on a larger scale. DWR solicited bids for a larger capacity automated ion-exchange system (10 gallons per minute) that would effectively remove hardness from agricultural drainage water. Producing “soft” drainage water reduces the need for cleaning or scale removal in other treatment technologies that DWR will test in the future. The future

treatment technologies will consist of electrocoagulation, vapor compression distillation, and reverse osmosis. Another benefit of ion exchange is that the regenerate will be utilized as a dust-control product in the form of calcium chloride and magnesium chloride.

Vapor Compression Distillation Investigation.

A vapor compression distillation unit was installed and operated on a limited basis during 2011. During the treatment process, “softened” drainage water is evaporated, converted to steam, and then condensed, resulting in distilled water and concentrated brine. The unit is expected to achieve a flow rate of 21 gallons per minute, and the expected ratio of distilled water to brine will be 80 percent to 20 percent. DWR will continue this investigation when an adequate and consistent source of supply water can be maintained at the project site. The preliminary investigation will determine the amount of energy required to operate the unit under differing flow ratios.

Agricultural Subsurface Drainage: Salt Recovery, Purification, and Utilization.

DWR continues to support investigations of processes for concentrating and purifying drainage salts for marketing purposes. The current technology that DWR is investigating is the electrochemical process. This process is a carbon dioxide-negative method that produces usable agricultural chemicals such as acids, bases, and carbonates as by-products.

Integrated On-Farm Drainage Management

DWR's South Central Region Office's Integrated On-Farm Drainage Management (IFDM) became a permanent activity when the Integrated Drainage Management Section was created in 2001. Its objective is to provide technical assistance on IFDM systems through advisory, technical, and oversight committees. IFDM is a drainage management system based on sequential

reuse of saline drainage water to irrigate crops of progressively increasing salt tolerance. Each sequential reuse reduces the volume of drainage water and increases the salt concentration. Drainage water too saline to irrigate crops is applied to solar evaporators, a management practice that SWRCB supports. The IFDM program funds, administers, and monitors contracts with State, federal, university, and local entities to learn more about IFDM systems. Findings indicate that IFDM systems have less significant environmental impacts than other options, and they reduce the volume of drainage water. The program is investigating the use of accelerated evaporation systems (solar evaporators) for zero-discharge systems.

IFDM program staff also:

- coordinate IFDM research activities and data collection with other agencies;
- assist growers and local agencies in planning and developing IFDM systems;
- provide assistance to research projects for the development of crops, including research being performed at RRR by California State University, Fresno, to assess the suitability of various salt-tolerant forages and halophytes for the sequential reuse of drainage water, forage quality, productivity, and water use;
- assist growers, water and drainage districts, and regional entities by providing information on salt-tolerant grasses and IFDM design specifications;
- assist SWRCB to develop policies for the management of drainage water, salt, and selenium; and
- improve enhanced evaporation features of the pilot solar evaporator.

DWR is continuing research on *Prosopis alba*, an Argentine mesquite tree, in cooperation with the Forestry Research Station at Catholic University of Santiago del Estero in

Argentina. *Prosopis alba*, which originated from the plantations of Catholic University of Santiago del Estero, is a highly salt-tolerant tree species that holds promise of ameliorating subsurface drainage problems in the soils of the western San Joaquin Valley. There were a number of trees that were planted at several drainage-impaired locations within the west side of the San Joaquin Valley. DWR has partnered with the Westside Resource Conservation District to monitor the growth and performance of the trees. A group of trees with the best salt and boron tolerance qualities were selected for final testing and were planted in a test site on the west side of the San Joaquin Valley for monitoring.

DWR continues to collect operational data from IFDM projects at RRR and AndrewsAg, Inc. for performance analysis. DWR staff also provided technical information and assistance on an agriforestry planting program on Kern County farms with salinity and shallow groundwater problems.

DWR and the Center for Irrigation Technology at California State University, Fresno, are working together with the New Jerusalem Drainage District in western San Joaquin County in a study to develop an operation and management plan to manage water supplies more efficiently and reduce subsurface drainage water. The main goal is for farmers to use their water supplies efficiently and minimize percolation losses into the local underground shallow water table. A primary goal of the New Jerusalem Drainage District is to eliminate the discharge of subsurface drainage water collected from the underground water table into the San Joaquin River. A secondary goal is to meet its respective objectives without adversely impacting soil and water quality and crop productivity within the district. The combined goals result in a complex mix of irrigation and drainage management activities that need to be integrated into a single plan.

Central Valley Salinity Management Program

In 2006, the Central Valley Regional Water Quality Control Board and SWRCB initiated a comprehensive effort to address salinity problems in California's Central Valley and adopt long-term solutions that would lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-term Sustainability is an effort to develop and implement a comprehensive salinity management program. DWR is involved in the process by providing expertise in salinity management through participation in the committees and activities of the Central Valley Salinity Policy Group. This group provides guidance and technical support on specific issues through various committees (the Technical Advisory Committee, Social and Economic Impact Committee, and Public Education and Outreach Committee) and overall direction and management (the Executive Committee) for the development of a comprehensive Central Valley salinity management plan.

Drainage Reduction and Reuse Program

DWR's Drainage Reduction and Reuse Program offers technical assistance, information, and other resources to growers and irrigators for applying irrigation water efficiently to reduce both excessive deep percolation and drainage water from the immediate on-farm source, while maintaining salt balance in the root zone.

The program objective is achieved through continued on-farm demonstration projects, studies, research, training, and workshops on scheduling irrigation management, advances in irrigation technologies, evaluating irrigation systems, reusing drainage water, and managing salinity.

Development of Alternative Value-Added Products from Cactus (*Opuntia*) Grown as a New Fruit/Forage Crop for Selenium-Laden Waters and Drainage-Impacted Soils in the West Side of Central California.

DWR is working with the U.S. Department of Agriculture and California State University, Fresno, in a research project to provide new and realistic information for growing and producing value-added products from *Opuntia* crops irrigated with poor-quality water and grown under nonirrigated conditions in the west side of Central California, as well as grown in poor-quality sediment soil. An additional research objective is to determine the potential of *Opuntia* for managing naturally occurring selenium, present in drainage waters and impaired soils in the west side of the San Joaquin Valley, via accumulation and volatilization, as well as for producing new marketable food products.

Environmental Services

DWR's South Central Region Office's Environmental Compliance Section investigates and reports on IFDM and other systems used for disposal and management of drainage water. Environmental activities include RRR research projects that involve biological monitoring activities required in accordance with Waste Discharge Requirements permits.

San Joaquin River Water Quality Improvement Program

DWR's Agricultural Drainage Program, in collaboration with other agencies, continues to make significant efforts to improve water quality in the San Joaquin River to benefit the State and SWP water contractors. These efforts are intended to control salinity and selenium discharges upstream of Vernalis. They include promoting on-farm and regional water management activities to reduce subsurface drainage, real-time water quality management to maximize the assimilative capacity of the San

Joaquin River, and efforts to time wetlands discharges when there is assimilative capacity in the San Joaquin River.

Specific efforts include the West Side Regional Plan, Reclamation's San Luis Drainage Feature Reevaluation to provide drainage service to the San Luis Unit of the Central Valley Project, and the IFDM program maintained by DWR and collaborating agencies.

On-farm and Regional Drainage Management Activities. Agricultural Drainage Program staff continued working with the Grassland Area Farmers to help reduce subsurface agricultural drainage water discharges into the San Joaquin River. Drainage management activities involving source control and drainage reuse have proven effective in reducing salt loads in the San Joaquin River. Since the Grassland Area Farmers implemented the Grassland Bypass Project, drainage discharges have decreased from 58,000 af to less than 14,000 af, and salt loads have been reduced from 210,000 tons to about 57,000 tons. The reductions were possible due to the San Joaquin River Improvement Project, an important Grassland Bypass Project component, funded by DWR through Propositions 13 and 50. It consists of 6,000 acres of land dedicated for reuse of subsurface drainage water generated by Grassland Area Farmers to grow salt-tolerant crops. DWR continued to provide technical assistance to improve and develop this part of the Grassland Bypass Project.

Real-time Water Quality Monitoring Program. The Real-time Water Quality Monitoring Program (RTWQMP) collects flow, electrical conductivity, and temperature data from several satellite-linked and web-accessible stations on the mainstem of the San Joaquin River and its tributaries. The information provided can be used by San Joaquin River water managers and stakeholders to improve management and coordination of

east side reservoir releases and agricultural and wetland drainage flows to achieve water quality objectives at the San Joaquin River compliance points. In the early stages, RTWQMP was funded by Reclamation and then by CALFED. Currently, DWR has assumed responsibility for funding most of the RTWQMP.

Forecasting flow and salinity conditions on the San Joaquin River allows decision makers to take advantage of assimilative capacity of the river when available. Data collected from the network of monitoring stations is used with the San Joaquin River Input-Output Day model to generate biweekly forecasts of salinity and flow conditions on the river near Vernalis and other upstream stations. DWR publishes the information weekly on its website.

Water Conservation Bond Laws

To help local agencies obtain financing for their water management programs, California voters approved eight bond laws between 1984 and 2006 authorizing DWR to provide low-interest loans and grants to fund project feasibility studies or construction activities.

- The Clean Water Bond Law of 1984 (Proposition 25) authorized \$10.5 million for water conservation projects.
- The Water Conservation and Water Quality Bond Law of 1986 (Proposition 44) authorized \$75 million for water conservation and groundwater recharge projects.
- The Water Conservation Bond Law of 1988 (Proposition 82) authorized \$60 million for water conservation, groundwater recharge, and new local water supply improvements.
- The Safe, Clean, Reliable Water Supply Act (Proposition 204), approved in 1996, authorized \$55 million for water

conservation, groundwater recharge, and local water supply projects.

- The Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act (Proposition 13), approved in 2000, authorized \$535 million for agricultural and urban water conservation, groundwater recharge, infrastructure rehabilitation, groundwater storage, and interim reliable water supply projects and studies.
- The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50) authorized \$500 million for the Integrated Regional Water Management (IRWM) Grant Program to be implemented jointly by DWR and SWRCB.
- The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) authorized \$1 billion to continue the IRWM Grant Program. Under this program, grants and construction loans are available with repayment periods of up to 20 years at reduced interest rates for most programs.
- The Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E) authorized \$300 million for IRWM Stormwater Flood Management.

Propositions 25, 44, and 204

Funding is fully obligated.

Proposition 82

New local water supply construction and feasibility study loans are still available. Water conservation and groundwater recharge funding has been fully obligated.

Proposition 13

Agricultural water conservation loan funding is still available.

All loan and grant funds for the Groundwater Recharge, Infrastructure Rehabilitation, Urban Water Conservation, Groundwater Storage, and Interim Reliable Water Supply programs have been obligated.

Integrated Regional Water Management Grant Program

The IRWM Grant Program is funded by Propositions 50, 84, and 1E.

Proposition 50

All Proposition 50 funds have been obligated.

Propositions 84 and 1E

In 2011, DWR conducted a second round of the IRWM Regional Acceptance Process (RAP). The RAP is the mechanism by which DWR evaluates newly forming and existing IRWM regions in order to allow them to compete for available IRWM grant funding. In September, the Director approved the final RAP decision, in which 10 IRWM regions were granted full acceptance into the grant program; including 7 regions that had previously been granted conditional acceptance in 2009, and 3 that were new regions. As of 2011, there were 48 IRWM regions in the State. These regions cover 87 percent of the land area and are inclusive of 99 percent of the population.

The IRWM Grant Program concluded three major grant solicitation efforts in 2011, awarding more than \$400 million in funding from Proposition 84 and Proposition 1E.

- In February, DWR awarded approximately \$21 million in Proposition 84 IRWM funding to 30 IRWM regions.
- In August, the Director approved final award of \$205 million in grant funding for 25 applications containing 190 projects for the Proposition 84 IRWM Implementation Grant Program.
- In December, DWR awarded \$178 million in Proposition 1E Stormwater Flood

Management grant funding to 18 entities to support the construction of 23 individual projects.

Local Water Supply. Projects in local water supply are constructed to increase water supplies, and include the following:

- new conveyance and/or storage facilities;
- groundwater extraction facilities and/or well-field development; and
- desalination (ocean or brackish groundwater recovery).



Chapter 6

Legislation and Litigation

The California Aqueduct.

Significant Events in 2011

Significant legislation related to the California Environmental Quality Act (CEQA) process; groundwater management; the Department of Water Resources (DWR) public contracting process; and eminent domain of property subject to a conservation easement passed in 2011.

Information for this chapter was provided by the Legislative Affairs Office and the Office of the Chief Counsel.

The Department of Water Resources (DWR) monitors State and federal legislation that affects management of the State Water Project (SWP). Legislative bill tracking involves reviewing legislation at its introduction, evaluating amendments in State Assembly and Senate committee hearings, and monitoring its enactment into law. The DWR Assistant Director for Legislation monitors proposed legislation. The Office of the Chief Counsel tracks State and federal litigation that impacts management of the SWP. The DWR Chief Counsel also manages legal cases that involve SWP operations.

Legislation

State Legislation

AB 209 (Ammiano; Chapter 171, Statutes of 2011)—California Environmental Quality Act, Lead Agency, Documents

Assembly Bill (AB) 209 requires a lead agency preparing an environmental impact report (EIR) or a negative declaration under the California Environmental Quality Act (CEQA) to ensure that access to the EIR or negative declaration is provided electronically.

AB 320 (Hill; Chapter 570, Statutes of 2011)—Environmental Quality: CEQA Determination, Dispute

CEQA provides a procedure by which a party may challenge the decision of a public agency and requires that party to notify real parties in interest of its challenge of the agency determination. AB 320 requires the public agency, in its notice, to list the recipient(s) of its approval for use by the petitioner in the service of its challenge.

AB 359 (Huffman; Chapter 572, Statutes of 2011)—Groundwater Management Plans

AB 359 requires local water agencies to map the recharge areas that substantially contribute to the replenishment of a groundwater basin and would condition the receipt of a State grant or loan upon

compliance with the law. AB 359 requires DWR to compile and post information on groundwater management plans on its website.

AB 1152 (Chesbro; Chapter 280, Statutes of 2011)—Groundwater

AB 1152 makes changes to SBX7 6 (Steinberg), of the 2009 Special Session on Water, concerning the responsibilities of agencies in reporting and monitoring groundwater basin elevations. It allows existing groundwater monitoring entities that do not meet the precise requirements for monitoring entities set forth in SBX7 6 to be grandfathered into the monitoring program for a 2-year period while they prepare groundwater management plans.

SB 224 (Pavley; Chapter 587, Statutes of 2011)—Public Contracts, DWR

Existing law provides that all contracts entered into by any State agency for goods, services, or other specified activities are void unless and until approved by the Department of General Services. That law provides exemptions for certain transactions and contracts. Senate Bill (SB) 224 also exempts all energy-related contracts from that law and allows DWR and the Department of General Services to develop a process whereby DWR has flexibility with regard to its selection of contractors under certain conditions.

SB 328 (Kehoe; Chapter 589, Statutes of 2011)—Eminent Domain Law, Conservation Easement

SB 328 revises eminent domain law to require public entities seeking to acquire property through eminent domain, where the property is subject to a conservation easement, to allow the holder of the conservation easement to participate in condemnation proceedings and seek compensation for its interest in the property.

Federal Legislation

There was no significant federal legislation in 2011 affecting management of the SWP.

Litigation

As of December 31, 2011, DWR was involved in, or closely monitored, a number of court cases and other actions related to the management of the SWP.

Sacramento-San Joaquin Delta

Delta Smelt

Delta Smelt Consolidated Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-407).

San Luis & Delta-Mendota Water Authority, et al. v. Salazar, et al. (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00407); *State Water Contractors v. Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00480); *Coalition for a Sustainable Delta, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00422); *Metropolitan Water District of Southern California v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00631); *Stewart and Jasper Orchards, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00892); *Family Farm Alliance v. Kenneth Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-01201).

Litigation stemming from a coalition of environmental groups' challenge to the

2004 biological opinion (BO) on delta smelt issued by the U.S. Fish and Wildlife Service continued. (Details of this litigation are described in earlier bulletins.)

In March 2011, the federal district court issued a final judgment after finding that the Bureau of Reclamation unlawfully failed to prepare an adequate National Environmental Policy Act (NEPA) analysis before adopting the 2008 BO, and that the BO was unlawful on several grounds. The court ordered the U.S. Fish and Wildlife Service to prepare a new BO and the Bureau of Reclamation to prepare an environmental impact statement (EIS) pursuant to NEPA. The parties have appealed.

Salmon

The Consolidated Salmon Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053).

San Luis & Delta-Mendota Water Authority, et al. v. Gary F. Lock, as Secretary of the United States Department of Commerce, et al. (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Stockton East Water District, et al. v. National Oceanic and Atmospheric Administration, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1090); *State Water Contractors v. Gary F. Locke, Secretary, etc., et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Kern County Water Agency, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1520); *Oakdale Irrigation District, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1580); *The Metropolitan Water District of Southern California v. National Marine Fisheries Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1625).

Litigation initiated in 2004 challenging the National Marine Fisheries Service's nonjeopardy BO for salmon on the proposed Central Valley Project (CVP)/SWP operations resulted in a new BO which concluded that CVP/SWP operations would likely cause jeopardy to the salmonid species,

sturgeon, and orcas, and would adversely modify designated critical habitat for three salmon species. In response, federal and State water contractors challenged the new BO on the grounds that federal defendants failed to comply with NEPA, the Endangered Species Act, and the reasonable and prudent alternative. DWR joined the litigation as an intervenor in January 2010.

In September 2011, the court ruled the salmon BO was inadequate and ordered that a new BO be prepared by the National Marine Fisheries Service. The parties have appealed.

California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance v. California State Water Resources Control Board and California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000653). The conservation groups allege that permit approvals and enforcement failure by the State Water Resources Control Board (SWRCB) has allowed DWR to cause extensive damage to the Bay-Delta Estuary and the fish and wildlife that live there. The administrative record is being prepared.

Longfin Smelt

State Water Contractors v. California Department of Fish and Game, Donald Koch, Director of the California Department of Fish and Game, California Department of Water Resources, Lester Snow, Director of the California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2009-80000203). This case, which challenges Incidental Take Permit No. 2081-2009-001-03 issued by the Department of Fish and Wildlife, remains stayed pending completion of the federal litigation challenging the BOs for delta smelt and salmon. The permit authorized the SWP to take longfin smelt, which inhabit the Sacramento-San Joaquin Delta and the San Francisco and San Pablo bay areas, under limited conditions that have the potential of substantially reducing the

ability of the SWP to regulate the ongoing and long-term provision of water deliveries.

In 2011, the parties commenced settlement discussions.

Bay Delta Conservation Plan

Central Delta Water Agency, South Delta Water Agency, RC Farms, Inc. and Reclamation District 999 v. California Department of Water Resources (Super. Ct. Sacramento County, No. 2010-80000698). In October 2010, parties with Delta interests filed a lawsuit challenging DWR's approval of the engineering geotechnical studies for the Delta Habitat Conservation and Conveyance Program. The studies are intended to assist DWR in identifying the best options for the construction of an isolated conveyance facility.

At an August 5, 2011, hearing, the court heard testimony as to whether there was substantial evidence to suggest a potential impact in the area of aquatic noise. A decision is expected from the court early in 2012.

In Re: Department of Water Resources Cases (Super. Ct. San Joaquin County, No. JCCP4594) (Court-Ordered Entry cases).

Twenty-four Delta property owners declined to grant DWR's request to gain temporary entry onto their properties in order to perform environmental and geological surveys. DWR sought orders for temporary entry onto the respondents' properties under Code of Civil Procedure Section 1245.010 et seq.

The court granted DWR's request for environmental surveys. However, in April 2011, the court denied DWR's request for geotechnical surveys on the grounds that the proposed surveys were a taking and beyond the scope of studies allowed under Code of Civil Procedure Section 1245.010 et seq. The parties appealed (see case below).

Property Reserve, Inc. v. The Superior Court of San Joaquin County (C067758, writ denied). The Delta landowners appealed the environmental order and DWR filed an appeal from the order denying the geotechnical surveys. After the Third District Court of Appeal denied the landowners' appeal, the landowners took their petitions to the Supreme Court. The Supreme Court granted the petitions and directed the Third District Court of Appeal to reconsider the matter. The Third District Court of Appeal then granted the landowners' request for stay and consolidated the appeals. All briefs in these matters have been filed, and the parties are waiting for the appellate court to set a hearing date.

State Water Resources Control Board Hearing

SWRCB Water Right Decision 1641 contains a water quality objective requiring DWR to annually maintain 0.7 millimhos per centimeter electrical conductivity at three compliance points within the South Delta, from April 1 through August 31, beginning in 2005. In response to allegations that the water quality objective was not being met and would not be met, the SWRCB issued a cease and desist order, which was final on May 16, 2006, requiring DWR and the Bureau of Reclamation to take corrective actions to eliminate the threat of noncompliance.

After a period of negotiations, the SWRCB issued a final order on January 5, 2010, modifying its 2006 order, which extended the schedule to implement measures to meet the water quality objectives pending completion of the SWRCB's review and potential modification of the salinity objectives. The order also required DWR, along with the Bureau of Reclamation, to undertake studies to assess the feasibility of implementing various measures to meet the salinity objectives. In 2011, DWR continued to abide by the cease and desist order and work with the SWRCB and the Delta Watermaster

to facilitate lasting solutions to the issues faced by DWR.

Jones Tract

Armando P. Vanni, et al. v. Rindge Land Reclamation District #2039 (Super. Ct. San Joaquin County, No. CV025820)

Three consolidated lawsuits alleging damages arising out of the levee breach on Upper Jones Tract in 2004 went to trial from August 22 to December 29, 2011. A decision is expected within 90 days.

Hydropower

Hyatt-Thermalito

Alameda County Flood Control & Water Conservation District, Zone 7 et al. v. State of California Department of Water Resources (C065522). Judgment was entered and an appeal was filed by 14 of the 29 State Water Contractors in the 2005 lawsuit alleging that the method used by DWR to allocate costs and revenue of its Hyatt and Thermalito power plants at Lake Oroville violated the terms of long-term water supply contracts.

Briefing has been completed and oral argument will likely take place in late 2012.

Oroville Relicensing—Federal Energy Regulatory Commission Project No. 2100

Butte County v. Department of Water Resources (Super. Ct. Yolo County, No. C071785). DWR is seeking renewal of the Federal Energy Regulatory Commission (FERC) license for its hydroelectric generation facilities at Oroville (Project No. 2100). DWR filed its relicensing application in 2005. The original 50-year FERC license expired on January 31, 2007. In February 2008, FERC authorized continued operation by issuing an annual license—under the same terms and conditions—that renews each year until FERC issues a new 50-year license.

DWR used a collaborative approach (the Alternative Licensing Process) to reach agreement with federal and State resource agencies, Native American tribes, local public agencies, nongovernmental organizations, and others on operational and design changes and environmental issues.

In March 2006, DWR filed a final settlement agreement with FERC executed by more than 50 interested parties. FERC's final EIS on the project was issued in May 2007. The SWRCB issued its water quality certification in December 2010.

DWR certified the EIR under CEQA and filed a notice of determination in July 2008. Butte and Plumas counties brought mandate proceedings in Butte County Superior Court challenging the adequacy of the EIR and seeking to vacate DWR's approval of the project. The petitions were consolidated and transferred to Yolo County. DWR lodged its CEQA administrative record on the project with the court in September 2009. In November 2010, the court heard oral argument on DWR's motion to compel payment of its record preparation costs. Trial in the case is set for January 17, 2012.

Other Cases

The Monterey Amendment

***Central Delta Water Agency et al. v. California Department of Water Resources* (Super. Ct. Sacramento County, No. 34-2010-80000561) (Central Delta I); *Central Delta Water Agency et al. v. Kern County Water Agency et al.*, DWR et al., real parties in interest (Super. Ct. Kern County, No. S-1500-CV-270965) (Central Delta II); *Rosedale-Rio Bravo Water Storage District and Buena Vista Water Storage District v. DWR* (Super. Ct. Kern County, No. S-1500-CV-270635-KCT) (Rosedale-Rio Bravo).** Legal challenges were brought against the 1995 Monterey Amendment and the EIR adopted by DWR in 2010. (The Monterey Amendment, litigation challenging the amendment and

the first EIR, and the settlement of that litigation and development of the second EIR are described in earlier bulletins.)

Central Delta I challenges the EIR adopted by DWR in 2010. Petitioners allege that the EIR fails to comply with CEQA. It is also a reverse validation petition, seeking a declaration that the Monterey Amendment and the transfer of the DWR-owned Kern Water Bank to Kern County Water Agency are invalid.

Central Delta II is also a reverse validation petition, seeking a declaration that the transfer of the Kern Water Bank from the Kern County Water Agency to the Kern Water Bank Authority is invalid.

Rosedale-Rio Bravo, filed by local public entities in Kern County that are adjacent to the Kern Water Bank, challenges the EIR on its description of the past, present, and future use and operation of the Kern Water Bank lands and their impacts.

Central Delta II was stayed pending resolution of the *Central Delta I* case. *Central Delta I* and *Rosedale-Rio Bravo* were coordinated for trial purposes. The parties are still preparing a record that can be certified for the CEQA litigation.

Water Diversions

***Cortopassi Partners, a California limited partnership and Reclamation District 2086 v. The State of California* (Super. Ct. San Joaquin County, No. CV034843).** Plaintiffs allege that DWR has created and maintained a nuisance in the Sacramento-San Joaquin Delta by artificially diverting water through the Delta for the SWP.

The settlement conference for this case is set for January 30, 2012, and the trial is set for February 27, 2012.

Drought Water Bank

Butte Environmental Council, California Sportfishing Protection Alliance and California Water Impact Network v. Department of Water Resources, California Natural Resources Agency, Governor Arnold Schwarzenegger and Does 1-50 (Super. Ct. Alameda County, No. 09446708). On February 27, 2009, the Governor proclaimed a statewide drought emergency. In March 2009, DWR implemented the 2009 Drought Water Bank to transfer water to areas in need, after filing a notice of exemption from CEQA with the concurrence of the California Natural Resources Agency and the California Environmental Protection Agency.

In April 2009, Butte Environmental Council and others brought a mandate proceeding against DWR and the other two agencies challenging DWR's reliance on the Governor's proclamation in claiming the CEQA emergency exemption.

In 2011, all parties entered into a settlement agreement. DWR will recover the money paid under the agreement from the water contractors who received water through the Drought Water Bank. The appeal has been dismissed.

Breach of Contract Arbitration

State of California acting by and through the Department of Water Resources v. Whitaker Contractors, Inc., a California corporation; Whitaker Contractors, Inc., a California corporation v. State of California acting by and through the Department of Water Resources (OAH No. A-0031-07). This breach of contract claim arose out of the Tehachapi East Afterbay completion construction project. The contractor failed to perform work according to contract requirements and was terminated. After lengthy arbitration proceedings, on August 11, 2011, the superior court entered a final judgment upholding the termination of the contractor and awarding DWR \$16.4 million. Whitaker has appealed the court's judgment, and

the parties will be filing appellate briefs in 2012. In the meantime, DWR is commencing efforts to collect on the judgment.

Colorado River

Quantification Settlement Agreement Cases ((2011) Cal.App.4th 758). These nine claims, which have been coordinated into a single proceeding before the Sacramento County Superior Court, challenge the Quantification Settlement Agreement (QSA) and associated actions taken to implement the QSA—a collection of 38 agreements that resolve disputes among water users in Southern California regarding their rights to California's shrinking share of Colorado River water. (The QSA and earlier litigation activities are described in bulletins from 2007 through 2010.)

On December 7, 2011, the Third District Court of Appeal reversed the trial court judgment. The court held that the State's financial obligation to fund all mitigation costs did not violate California Constitution Article 16, Sections 1 or 7—the legislative appropriation and debt limitation provisions. Respondents have sought Supreme Court review.

Area of Origin

Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte v. California Department of Water Resources and Does 1-50 (Super. Ct. Sacramento County, No. 34-2008-00016338). In July 2008, four SWP water supply contractors—Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte—sued DWR claiming priority to delivery of SWP water and protections from water shortages based on area and watershed of origin statutes, and because they signed SWP water supply contracts. Fourteen SWP contractors located south of the Delta and outside the area of origin have intervened.

The case has been stayed pending informal mediation by the parties to settle the matter.

Perris Dam

Metropolitan Water District; Coachella Valley Water District; Desert Water Agency, Real Parties; Albert Thomas Paulek v. California Department of Water Resources (Super. Ct. Riverside County, No. RIC1120142).

On December 21, 2011, Paulek filed a writ petition challenging DWR's approval of the Perris Dam remediation program final EIR. The petition raises numerous challenges, including that the EIR does not adequately address and mitigate for impacts to the endangered Stephen's Kangaroo Rat or to impact to various species covered by a multispecies habitat conservation plan. DWR is not willing to prepare the administrative record until the petitioners agree to pay the estimated costs for doing so. The parties have not yet resolved what should go in the record or what constitutes appropriate costs.

Silverwood Lake

Valerie Hamm and Thomas Hamm v. County of San Bernardino, San Bernardino County Flood Control District, Victor Valley Wastewater Reclamation Authority, Mojave Water Agency, State of California (Super. Ct. San Bernardino County (Victorville District), No. 1105980).

Plaintiffs in this case own property along and in the bed of the Mojave River, in Oro Grande. They are suing for damage to their property caused by diverted waters of the vegetation-choked portions of the Mojave River during storms in December 2010. DWR does not believe the plaintiff's theory of causation states a cause of action against DWR and is seeking to have the complaint against DWR dismissed.

Environmental Review Acts

The National Environmental Policy Act (NEPA) (Title 42 United States Code Sections 4321–4347 [1970]) and the California Environmental Quality Act (CEQA) (California Public Resources Code Sections 21000–21177 [1970]) require government agencies to document and consider environmental consequences of their actions in their decision-making processes. NEPA states that it is the goal of the federal government to use all practicable means consistent with other considerations of national policy to protect and enhance the quality of the environment. All federal agencies must prepare an environmental impact statement (EIS), including a discussion of mitigation measures and alternatives, for federal actions that could significantly affect environmental quality.

CEQA is patterned after NEPA. Under CEQA, agencies are required to (1) disclose, through an environmental impact report (EIR), the significant impacts a proposed project would have on the environment, and (2) identify ways to reduce or avoid environmental damage.

CEQA applies to projects directly undertaken, funded, or approved by State or local agencies. NEPA applies to projects directly undertaken, funded, or approved by federal agencies. The Department of Water Resources (DWR) conducts many projects in cooperation with federal agencies. In these cases, both CEQA and NEPA must be followed.

NEPA requires that mitigation measures and alternatives be disclosed to the public in the EIS, but it does not generally require federal agencies to adopt such mitigation measures or alternatives. CEQA does impose substantive duties on all California government agencies approving projects with significant environmental impacts to adopt alternatives or mitigation measures that they find to be feasible to substantially lessen these impacts, unless there are overriding reasons they cannot. When a project is subject to both CEQA and NEPA, both laws encourage agencies to cooperate in planning the project and preparing joint environmental documents.

The environmental review process allows citizens to learn about a proposed project and its potential significant effects and to participate in the decision-making process by providing feedback on agency information. The review process requires agencies to:

- describe the proposed project and the purpose or need for it;
- identify the lead and cooperating agencies involved in the project;
- invite interested parties to participate in the process;
- determine the scope of study with input from responsible agencies and the public;
- prepare and distribute a draft EIS or EIR;
- respond to comments received on the draft;
- prepare the final EIS or EIR;
- make findings and adopt feasible alternatives or mitigation measures to avoid significant effects, if applicable;

Environmental Review Acts

- adopt a monitoring plan to ensure compliance with mitigation measures; and
- prepare a list of permits required to implement the project if it is approved.

The scoping phase, which occurs early in the review process, is particularly important because it enables government agencies to identify issues and topics to be considered or addressed in the EIS or EIR.

Information gathered in the scoping phase helps agencies identify and evaluate reasonable alternatives, identify potential environmental impacts of the project, determine data and information needed, develop a work schedule, and allocate resources for preparing and distributing the draft environmental document for public review and comment.

NEPA requires a lead agency to involve the public during scoping, while CEQA does not. CEQA, however, does encourage public involvement, and agencies often opt to conduct activities that provide for wide public involvement. Members of the public may raise issues and identify additional alternatives, environmental effects, methods of assessment, and mitigation measures during the scoping phase and continue to participate in the review process for the draft environmental document. Thus, the CEQA process may lead to changes in a project through the development, consideration, and adoption of alternatives or enforceable mitigation measures to avoid or reduce any potential significant adverse effects on the environment.

If the project is approved, the lead agency publishes a document discussing all the factors considered in reaching its decision to proceed with the proposed action. It also discusses whether all practical means to avoid or minimize environmental harm have been adopted, and if not, the reasons they were not.



Chapter 7

Water Supply Development and Reliability

Farming in the Sacramento-San Joaquin Delta.

Significant Events in 2011

Calendar year 2011 was a wet year, and the final State Water Project (SWP) allocation was set at 80 percent on April 20. The year was sufficiently wet that the Sacramento-San Joaquin Delta remained in excess conditions until late in the year, precluding any water transfers during the year.

This wet hydrology prevented accounting of Yuba County Water Agency releases as transfer water under the Lower Yuba River Accord (Yuba Accord) for the entire summer transfer season.

Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Integrated Regional Water Management, the Division of Statewide Integrated Water Management, and the Bay-Delta Office.

The Department of Water Resources (DWR) is working to improve the reliability of State Water Project (SWP) supplies and the long-term water contract annual Table A water allocations delivered to SWP water contractors. Staff is engaged in planning activities to develop additional water supplies and storage capacity.

Developing new water supplies and storage projects that are economically, environmentally, and technically sound, while satisfying institutional requirements and political concerns, presents significant challenges. Many concerns center on possible adverse effects that additional storage and delivery facilities may have locally and on the Sacramento-San Joaquin Delta. In the SWP conveyance system, the Delta is the critical link between water supplies in the Sacramento Valley and deliveries to the rest of the Central Valley and Southern California.

DWR works with the State and federal governments, local agencies, and public interest stakeholder groups to ensure water supply reliability now and in the future. To meet SWP water contractors' needs for sufficient water supplies, DWR is engaged in planning, developing, and providing local assistance with the objective of augmenting future SWP water supplies.

Supply Development and Reliability

Some of the activities DWR is engaged in to augment future SWP supplies include:

- facilitating transfers between SWP long-term contractors and other agencies, including Central Valley Project (CVP) contractors;
- funding studies on the evapotranspiration of rice and the Giant Garter Snake, a protected species known to inhabit rice growing regions of the Sacramento

Valley, to better understand issues related to the transfer of water made available by crop idling;

- assisting with developing and implementing local and regional conjunctive use programs in the Sacramento Valley;
- constructing a groundwater monitoring network and a subsidence monitoring network to detect potential impacts caused by pumping associated with groundwater substitution transfers;
- managing the Feather River watershed above Lake Oroville to reduce sedimentation in the lake and preserve storage capacity; and
- investigating and evaluating storage projects.

Water Conveyance Through the SWP

DWR encourages and facilitates temporary transfers of water using SWP conveyance facilities for long-term SWP water contractors and other agencies to help meet local, State, and environmental water supply needs. As a practical matter, SWP facilities are often needed to convey transfer water from the existing place of use to the place of use of the transferee. State law requires DWR to make unused SWP capacity available for transfers upon payment of fair compensation, provided that (1) no legal user of water will be injured; (2) there will be no unreasonable effect on fish, wildlife, or other instream beneficial uses; and (3) there will be no unreasonable effect on the overall economy or the environment of the county

from which the water is being transferred (California Water Code [CWC] Section 1810). Water transfers can involve transfers and exchanges among SWP long-term water contractors, between SWP water contractors and non-SWP entities, or between two or more non-SWP entities.

Due to the wet hydrologic conditions, DWR did not convey transfer water in 2011.

Transfer and Exchange Evaluations

An important element of any water transfer is determining what quantity of water, if any, is transferable.

The transferability of water depends on many factors including the source of the water being transferred, what is being done to make water available, when the water can be made available, and the type of water right the existing user holds. Several CWC provisions authorize temporary transfers of water rights issued by the State Water Resources Control Board (SWRCB) (appropriative water rights issued after 1914) and put conditions on the transfers to protect those not involved in them.

Short-term transfers, of less than one year, are authorized under Sections 1725–1732. Long-term transfers, for periods greater than one year, are authorized by Sections 1735–1737. Other CWC sections specify conditions under which water can be transferred and legal protections for those transferring water.

Transfers based on water rights obtained before 1914 are not under the jurisdiction of the SWRCB but must comply with the requirements of the California Environmental Quality Act (CEQA) and possibly the National Environmental Policy Act (NEPA).

The CWC sections noted above contain provisions intended to protect other legal users of water and fish and wildlife from the possible adverse effects of a water transfer.

These provisions reflect the concept that changes can be made to the authorized place and purpose of use or point of diversion of a water supply as long as there is no injury to others as a result of the change (the “no injury rule”). The no injury rule in State water law is intended to protect other water right holders from the potential expansion of water use beyond what would have been used by the water rights holder in the absence of the transfer. Hence, under the no injury rule, only “new water” is transferable (i.e., water added to the downstream water supply only as a result of the transfer). To protect other users, a transfer would not be authorized to the extent that it would reduce the amount or timing of water that would have been available to downstream users, regardless of the water right priority of those users.

CWC Section 1810(d) requires DWR to consider potential impacts of a transfer on legal users, instream uses, and the economy of the area from which the water would be transferred. DWR must determine whether to allow use of any surplus water conveyance capacity for a transfer. DWR reviews each request to transfer water through SWP facilities to assure that only new water will be transferred. This requirement applies to transfers based on both pre-1914 and post-1914 water rights.

Transfer water is typically developed through four methods: surplus water released from storage facilities, substitution of groundwater for transferred surface water, idling agricultural land or shifting to lower water use crops, and undertaking conservation activities that develop new water. Transfers may result in direct impacts and third-party impacts (impact to parties not involved in the transfer). Certain CWC provisions were enacted to limit potential impacts. For example, additional groundwater pumping from a groundwater substitution program can potentially affect other groundwater

users in the area. CWC Section 1745.10 generally requires that transfers of surface water in which groundwater will be pumped to make up for the transferred surface water: (1) be consistent with a groundwater management plan adopted pursuant to State law for the affected area, or (2) not create or contribute to conditions of long-term overdraft in the affected groundwater basin.

Injury can also occur due to stream depletion induced by increased pumping from wells for groundwater-based transfers. The amount of water depleted from the stream must be deducted from the total groundwater pumped for the transfer or the net surface water flows will not increase as assumed. Consequently, to evaluate possible impacts from groundwater substitution transfers, DWR assesses a streamflow depletion factor, which represents an estimate of the effects of the additional groundwater pumping on the surface water system. Each type of transfer has its own set of potential impacts that must be evaluated to protect parties not involved in the transfer.

With the exception of short-term transfers under CWC Section 1725, which provides for an expedited process for water rights issued by the SWRCB, water transfers are subject to compliance with CEQA and, possibly, NEPA. The CEQA/NEPA and SWRCB processes provide opportunities for public review and comment on water transfer proposals.

Staff in the State Water Project Analysis Office, Division of Operations and Maintenance, Division of Integrated Regional Water Management, and the Office of the Chief Counsel evaluate proposed water transfers to determine whether the transfers will impact the SWP, other water users, the environment, or the area from which the water will be transferred.

SWP Delivery Reliability Report

To assist local agencies assessing their overall water supplies, DWR provided current data on the SWP's ability to deliver water under 2009 conditions and for projected conditions in a biennial report entitled the *Draft State Water Project Delivery Reliability Report 2009*. The 2009 report was finalized in August 2010, and the next draft update of this report, originally expected in 2011, is now expected early in 2012.

Delivery reliability depends on three factors: (1) the availability of water at the source, (2) the ability to convey water from the source to the desired point of delivery, and (3) the level of demand. Information in the 2009 report for projected conditions accounts for the forecast effects of climate change. In addition, the analysis of the ability to convey water from the source to the point of delivery assumes only SWP facilities and permits existing in 2009. In order to provide a conservative estimate of water delivery reliability, no planned facility improvements to the SWP are assumed. Lastly, the level of demand for SWP water, the amount, and the pattern of demand, were derived from historical data and information received from SWP water contractors.

Figure 7-1 shows the probability that a given amount of SWP annual Table A water will be delivered from the Delta for conditions in 2009 and projected to exist in 2029. The following can be deduced for year 2029 conditions:

- In 75 percent of the years, annual SWP Table A water delivery is estimated to be at or above 2.14 million acre-feet (maf) per year (52 percent of 4.13 maf).
- In 50 percent of the years, delivery is estimated to be at or above 2.60 maf per year (63 percent of 4.13 maf).
- In 25 percent of the years, delivery is estimated to be at or above 2.92 maf per year (71 percent of 4.13 maf).

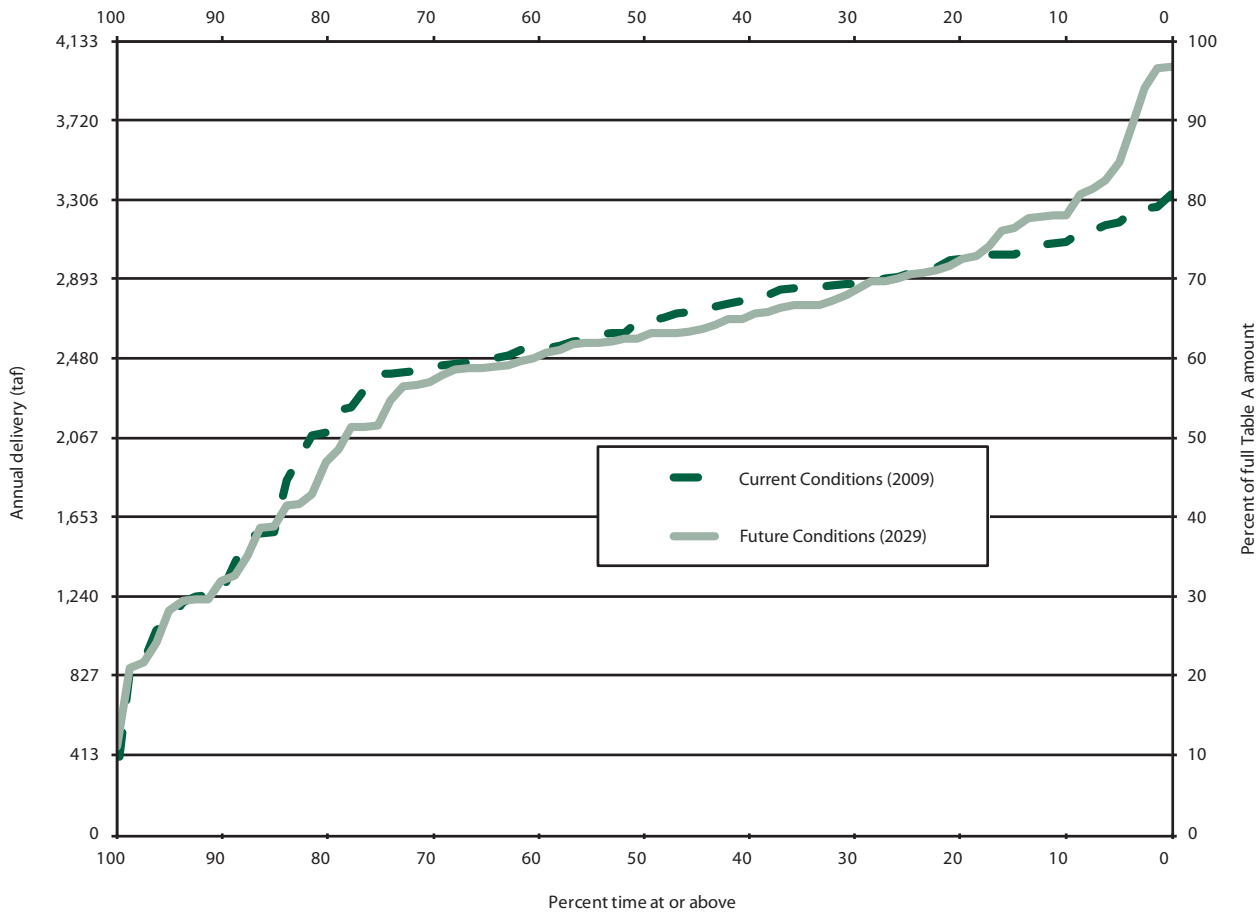


Figure 7-1 SWP Annual Table A Water Delivery Probability for Years 2009 and 2029

Detailed information on the assumptions, data, and results of additional studies, as well as the other scenarios for annual Table A amounts, can be found in the reliability report referenced above, available on DWR’s website.

SWP Future Water Supply Program

The Future Water Supply Program coordinates DWR’s efforts to implement the Sacramento Valley Water Management Program, provides technical support within DWR for the Lower Yuba River Accord (Yuba Accord), and monitors and assesses conditions of the Sacramento Valley groundwater basin that affect

the yield of the SWP. The Future Water Supply Program’s goal is to determine the effects of Sacramento Valley groundwater management activities, including water transfers, on SWP water supply reliability, and recommend actions to improve or maintain that reliability.

The Future Water Supply Program’s Upper Feather River watershed management component evaluates the state of the Feather River watershed above Lake Oroville with respect to water management and restoration actions being planned or implemented within the watershed. These actions are intended to improve the ecological and hydrologic function of watersheds, thus affecting base flow,

improving flood attenuation, and reducing erosion and sedimentation.

In 2011, DWR continued a collaborative effort with local stakeholders to develop and enhance monitoring activities for assessing the immediate and long-term effects of these water management and restoration actions, especially those related to the plug and pond meadow restoration technique. Implementation of the Thompson Creek Meadow Water Budget Study continued in cooperation with the U.S. Forest Service. The study uses detailed monitoring to assess the pre- and post-project hydrologic effects of this plug and pond technique.

Sacramento Valley Water Management Program

The precursor to the current Future Water Supply Program was DWR's work to incorporate conjunctive-use projects in the Sacramento Valley into the SWP to increase SWP dry-year yield. Similar projects were proposed to be implemented by the Sacramento Valley Water Management Agreement, which was signed by stakeholders in early 2003.

For more information on issues surrounding the Sacramento Valley Water Management Agreement, see Bulletins 132-02, 132-03, and 132-04, available on DWR's website.

SWP Water Rights Activities

Water Right Permits

SWP operations are governed by the terms and conditions contained in DWR's water right permits and licenses along with other State and federal regulatory restrictions, including biological opinions (BOs) for the protection of endangered species. DWR holds water right permits authorizing SWP operations at each of the SWP facilities, including the Oroville and Delta facilities (which include the North Bay Aqueduct), for water supply purposes. Each permit

specifies the authorized quantities of direct diversion and diversion to storage, place of use, purpose of use, and time within which the permitted quantities must be put to beneficial use. A change in any of the terms and conditions contained in the water right permits and licenses, including a change in the place or purpose of use or point of diversion, requires SWRCB approval.

Diversion and use of SWP water throughout the SWP service area has increased since initial operations in the 1960s. However, due to a number of factors, including operational and regulatory constraints, the beneficial use of water has not yet reached the maximum quantities anticipated for full development of the SWP.

DWR filed a petition for change on February 10, 2010, to allow the transfer of up to 8,000 acre-feet (af) of SWP water from the Tulare Lake Basin Water Storage District service area and up to 2,000 af of SWP water from the Empire-West Side Irrigation District service area to land within Westlands Water District each year for a period of up to 15 years. Two landowners with acreage in the Tulare Lake Basin Water Storage District, Empire-West Side Irrigation District, and Westlands Water District requested the change to allow the delivery of a portion of their SWP water supply to land in the Westlands Water District. The SWRCB issued Order WR 2011-0010-DWR approving the change on April 1, 2011. No water was transferred in 2011 under the long-term petition.

Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

The Delta and Suisun Marsh are located where California's two major river systems, the Sacramento and the San Joaquin, converge and flow westward to meet incoming seawater tides flowing through the San Francisco Bay. The watershed of

the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) is a critical source of water supply for much of California. The watershed is a source of drinking water for two-thirds of the State's population; it supplies some of the State's most productive agricultural areas; and it provides water for fish, wildlife, and other public trust uses of water within and upstream of the estuary.

Water originating in the Bay-Delta watershed is delivered to areas within the watershed and to areas south and west of the estuary. The largest water distribution systems that release stored water into the Delta and directly divert water from the Delta are the SWP, operated by DWR, and the federal CVP, operated by the Bureau of Reclamation (Reclamation). Numerous other water storage and diversion projects influence Bay-Delta Estuary inflows, outflows, water quality, and other hydrologic characteristics.

The SWRCB regulates both the quality of water in the Bay-Delta Estuary and the diversion and use of water released into and diverted from the estuary for water supply. The SWRCB coordinates its regulatory authorities under State laws governing water quality and water rights, ensuring that water quality is protected for all beneficial uses when water is diverted from the estuary.

Under its authority to protect beneficial uses of water, the SWRCB adopted the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (WQCP) on December 13, 2006 (Resolution No. 2006-0098). The WQCP contains objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for protection of various beneficial uses such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in part or in whole, depending on the circumstances, through conditions on water right permits and licenses.

In 1999, the SWRCB adopted Water Right Decision 1641 (later modified by Order WR 2000-02) modifying the terms and conditions of a number of water right permits and licenses, primarily those for the SWP and CVP, to implement the objectives of the 1995 WQCP.

SWRCB Bay-Delta Proceedings—2011 Activities

In 2011, SWRCB proceedings examined a number of issues in the Bay-Delta Estuary relating to water quality, protection of beneficial use for agriculture and fish and wildlife, and salinity issues, among others, which have the potential to affect Delta water supply and reliability.

Strategic Workplan for the Bay-Delta Estuary

On July 16, 2008, the SWRCB adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*. Although the workplan contains many water quality related elements, some elements are related to water supply reliability:

- reviewing southern Delta salinity and San Joaquin River flow objectives to protect water supply for agricultural beneficial use;
- comprehensively reviewing the 2006 WQCP and its implementation through water rights and other requirements to protect fish and wildlife beneficial uses and the public trust;
- evaluating SWP and CVP methods of diversion in the Delta to ensure that they are reasonable, beneficial, and protect the public trust;
- implementing actions under the SWRCB's statutory responsibilities regarding water right compliance, enforcement, and other activities to ensure adequate flows to meet water quality objectives; and

- implementing actions to promote water use efficiency for urban and agricultural water users.

General timelines in the workplan may change as a result of changes to the Bay Delta Conservation Plan timeline or other issues. SWRCB staff prepare quarterly updates on the implementation of the workplan and, as appropriate, recommend modifying activities in the workplan to ensure that SWRCB actions continue to protect beneficial uses in the Bay-Delta. In May 2011, SWRCB staff issued an update to the strategic workplan's element actions and timelines.

2006 Bay-Delta Plan Review

Water Code Section 13240 requires that the WQCP be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act. A workshop on October 8, 2008, formally began a review of the 2006 WQCP.

The review and amendment process for the 2006 WQCP consisted of:

- identifying elements that may need amendment or new elements that may need to be added;
- preparing any amendments or revisions to the entire WQCP; and
- SWRCB's adoption of some or all of the amendments or revisions.

SWRCB information-gathering activities may affect the scope of the WQCP review and may include evidentiary hearings on critical issues concerning the Delta's ecology. The Bay Delta Conservation Plan environmental review may provide some of the analyses needed for the comprehensive WQCP review.

SWRCB's ongoing review and update of the 2006 Bay-Delta Plan continued in 2011.

Southern Delta Salinity and San Joaquin River Flow Objectives.

A January 2011 workshop was held for the SWRCB to receive comments and technical information and to discuss the *Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives* (October 2010). Following the workshop, the SWRCB initiated an external scientific peer review of the scientific basis and modeling contained in the report. The peer review was completed in November 2011.

In June, the SWRCB held a workshop to consider the scope and content of its environmental document relating to the review and the program of implementation of southern Delta salinity and San Joaquin River flow objectives.

For more information about salinity objectives and compliance monitoring in the South Delta, see Chapter 4, Water Quality Programs.

Storage Program

DWR is the State lead agency for the Storage Program, which consists of surface storage studies and groundwater programs and projects. The Storage Program began under the CALFED Bay-Delta Program. (For background on the CALFED Bay-Delta Program, see Bulletins 132-95 through 132-11 and/or Chapter 2, Delta Resources.)

The Storage Program is a comprehensive program with potential benefit for the SWP consisting of actions related to surface and groundwater storage. DWR's Division of Statewide Integrated Water Management and Division of Integrated Regional Water Management have been working with State and federal agencies to enhance storage and conjunctive-use programs that support local project development via loans and grants. The Storage Program is part of an ongoing evaluation of how storage, both

groundwater conjunctive use and surface storage, can help meet California's urban, agricultural, and environmental water supply reliability, ecosystem restoration, and water quality needs.

Surface Storage Investigations

Surface storage investigations are developing environmental documentation and feasibility studies for four of the five surface storage projects identified for further study in the CALFED record of decision.

In-Delta Storage Program

The In-Delta Storage Program may provide capacity to store approximately 217,000 af of water in the South Delta for a wide array of water supply, water quality, and ecosystem benefits. The project would include two storage islands (Webb Tract and Bacon Island) and two habitat islands (Holland Tract and Bouldin Island).

In 2007, further study of the In-Delta Storage Program was suspended, and no further work has been done on the project since then.

Los Vaqueros Reservoir Expansion Project

Contra Costa Water District (Contra Costa) owns and operates the 100,000 af Los Vaqueros Reservoir just southwest of the Sacramento-San Joaquin Delta. The Los Vaqueros Reservoir Expansion Project involves analysis of increasing reservoir storage by as much as 175,000 af, for a potential storage capacity of up to 275,000 af.

The project objectives are: (1) to develop water supplies for environmental water management; (2) to increase water supply reliability within the San Francisco Bay Area; and (3) to the extent possible, improve the quality of water deliveries to municipal and industrial customers without impairing the project's ability to meet the first two objectives.

In 2009, Contra Costa released a public draft environmental impact statement/ environmental impact report (EIS/EIR) for expansion alternatives of the dam and reservoir to increase storage up to 275,000 af.

The Contra Costa Board certified a final EIR and approved an expansion from 100,000 af to 160,000 af on March 31, 2010.

In 2011, Contra Costa completed the design and moved forward with construction, which is scheduled for completion in 2012. With additional funding, local, State, and federal partners may choose to continue to study the feasibility of a 275,000 af expansion alternative in the context of other Delta initiatives to improve Delta conveyance and better protect Delta fisheries, including long-term programs being explored in the Bay Delta Conservation Plan.

Shasta Lake Water Resources Investigation

Reclamation, in coordination with other agencies, is studying the feasibility of expanding Shasta Dam and Lake, primarily to promote increased survival of anadromous fish populations in the upper Sacramento River and to increase water supply reliability. An enlargement of Shasta Dam would inundate additional lands around the existing reservoir and affect a portion of the McCloud River. California Public Resources Code Section 5093.542(c), the Wild and Scenic Rivers Act, states that, "except for participation by the Department of Water Resources in studies involving the technical and economic feasibility of enlargement of Shasta Dam, no department or agency of the state shall assist or cooperate with, whether by loan, grant, license, or otherwise, any agency of the federal, state, or local government in the planning or construction of any dam, reservoir, diversion, or other water impoundment facility that could have an

adverse effect on the free-flowing condition of the McCloud River, or on its wild trout fishery.”

The State budget does not include funding for DWR to continue participating in this study. However, Reclamation’s planning is ongoing.

North-of-the-Delta Offstream Storage Investigation

DWR and Reclamation are working in partnership with local, State, and federal agencies to further study north-of-the-Delta offstream storage opportunities. The North-of-the-Delta Offstream Storage Investigation focuses on potential projects on the west side of the Sacramento Valley, including Sites Reservoir.

Storing water in offstream reservoirs during excess flow periods could provide opportunities to increase water storage in an environmentally sensitive manner. The stored water can then be made available to enhance water management flexibility in the Sacramento Valley and the Bay-Delta Estuary, reducing water diversions on the Sacramento River during critical fish migration periods, increasing the reliability of supplies for the Sacramento Valley and statewide, and providing storage and operational flexibility to support environmental enhancement actions and adapt to climate change.

North-of-the-Delta Offstream Storage Investigation studies were ongoing in 2011.

Upper San Joaquin River Basin Storage Investigation

DWR and Reclamation, in coordination with other State and federal agencies, are evaluating opportunities for increased storage in the upper San Joaquin River watershed. The objectives of the Upper San Joaquin River Basin Storage Investigation

are to: (1) increase water supply reliability and operational flexibility in the CVP’s Friant Division, other San Joaquin Valley areas, and other regions, and (2) enhance water temperature and flow conditions in the San Joaquin River in support of San Joaquin River restoration efforts. Other opportunities include additional hydropower generation, reduction of flood damages, water quality improvements, and recreation site development.

In May 2009, Reclamation and DWR released a plan formulation report for the Upper San Joaquin River Basin Storage Investigation that described the alternative formulation, evaluation, and comparison activities that led to selection of Temperance Flat RM 274 Reservoir for detailed feasibility-level evaluation. The report described the progress of the study to date and included additional information on the economics, operations, and costs of Upper San Joaquin River Basin Storage Investigation alternatives. It also defined a set of alternative plans to be considered in the study’s feasibility report and EIS/EIR.

The study continued in 2011 with draft and final feasibility studies and environmental documents scheduled for 2014 and 2015.

Conveyance Program

The Conveyance Program consists of projects proposed in the North and South Delta. These projects are discussed briefly below; more detailed information about the Delta can be found in Chapter 2, Delta Resources.

The SWP obtained federal and California Endangered Species Act coverage through the December 2008 U.S. Fish and Wildlife Service BO for Delta Smelt; the February 2009 Department of Fish and Wildlife incidental take permit (ITP) for Longfin Smelt; and the June 2009 National Marine Fisheries Service (NOAA Fisheries) BO for salmon, steelhead, and Green Sturgeon.

Many of the regulatory requirements will require studies and projects, which were under development in 2010.

Development continued in 2011, including improving existing fish release sites and identifying two new fish release sites; planning a fishing facility and associated predation study for Clifton Court Forebay, evaluating the screening efficiency of Skinner Fish Facility; and evaluating fish screens at Barker Slough Pumping Plant and the Roaring River Slough Distribution System and diversions around Sherman Island. A Fish Science Building is also being planned to hold and rear fish for use in the studies and projects needed to comply with the BOs and the ITP.

North Delta Program

The North Delta Program involves studies related to a through-Delta facility, Delta Cross Channel reoperation, a flow-control facility in the Franks Tract region, and a project to improve flood management and the ecosystem along the Mokelumne River.

In 2009, work on several existing projects was suspended due to the State's fiscal crisis. One of these, *The Delta Regional Salmon Outmigration Study*, had been undertaken as part of the Delta Cross Channel evaluation to address fishery and water quality concerns. The last phase of the field study and subsequent data analysis were not completed.

In 2010 and 2011, efforts were made to resume analysis of data collected in the winter of 2008–2009. Unfortunately, U.S. Geological Survey staff contracted to conduct the study were not readily available to do the analysis. However, it is expected that work will resume in 2012.

The Franks Tract Project involves installation of one or more operable barriers in river channels around the Franks Tract region

to reduce sea water intrusion and enhance conditions for sensitive fish species.

Modeling studies associated with the EIS/EIR for the project were originally conducted using conditions prior to the new BOs and ITP. A sensitivity modeling analysis was completed to assess the benefits of the project on SWP and CVP operations under implementation of the new BOs and ITP, and with or without implementation of the Delta Habitat Conservation and Conveyance Program. Preliminary results showed the Franks Tract Project to be beneficial to water quality even with the new BOs and ITP or with the Delta Habitat Conservation and Conveyance Program.

With the North Delta Flood Control and Ecosystem Restoration Project, solutions to improve flood management and the ecosystem are being considered, including setback levees, detention basins, dredging, and levee degradation for floodplain expansion. For more information about this project, see Chapter 2, Delta Resources.

Scientific and engineering studies continued in 2011.

South Delta

Actions in the South Delta include the South Delta Improvements Program (SDIP), implementing flood control and ecosystem improvements in the lower San Joaquin River, an intertie between the SWP California Aqueduct and CVP's Delta-Mendota Canal, and continuation of DWR's Temporary Barriers Program.

SDIP is a two-stage project. Stage 1 proposes to reduce the movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River and to maintain adequate water levels and water quality for agricultural diversions in the South Delta. Stage 2 would increase water deliveries and delivery reliability to SWP and CVP

contractors south of the Delta and increase the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay.

The SDIP final EIR/EIS (2006) evaluated alternatives and proposed proceeding with SDIP Stage 1. This component involves constructing permanent operable gates and channel dredging in the South Delta. DWR is proposing installation of these permanent gates to replace temporary structures currently installed and removed each year under DWR's Temporary Barriers Program.

Reclamation and DWR's 2008 biological assessment for the SWP and CVP Operations Criteria and Plan included operation of the SDIP permanent operable gates.

The U.S. Fish and Wildlife Service BO, issued in December 2008, concluded that coordinated operations of the CVP and SWP would jeopardize Delta Smelt. The U.S. Fish and Wildlife Service provided a reasonable and prudent alternative under which SDIP could move forward.

The NOAA Fisheries BO, issued in June 2009, concluded that CVP and SWP operations would jeopardize a number of anadromous species, in particular Chinook Salmon. NOAA Fisheries provided no reasonable and prudent alternative for SDIP. DWR initiated discussion with NOAA Fisheries in late 2009 to establish what actions could lead to a reasonable and prudent alternative under which SDIP could move forward; however, NOAA Fisheries stated an interest in holding off on further discussion until completion of an on-going multiyear South Delta Temporary Barriers Program predation study. The study field data collection was completed in 2011. Data from the study will be useful in considering permanent barrier design options and operation strategies to minimize predation.

Any action regarding SDIP Stage 2 will require further study and public input.

Stage 2 planning continued to be suspended in 2011.

Lower Yuba River Accord

The Yuba Accord's purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Yuba Accord provides revenues for local flood control and water supply projects; water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries; and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

The Yuba Accord is based on three agreements, as follows:

- a water purchase agreement with DWR;
- conjunctive use agreements with Yuba County Water Agency member units; and
- a fisheries agreement.

The three Yuba Accord agreements were executed in late 2007 and early 2008, and the SWRCB approved the Yuba Accord in March 2008, setting flow schedules for the Yuba River and authorizing accord-based water transfers through 2015.

The water purchase agreement transfers water to help offset Delta export reductions annually and provides dry year transfer water for SWP and CVP contractors from surface and groundwater substitution sources.

Due to the wet hydrology in 2011, excess conditions in the Sacramento-San Joaquin Delta prevented accounting of Yuba County Water Agency releases as transfer water for the entire summer transfer season.

For additional details about the Yuba Accord, see Chapter 9, Water Contracts and Deliveries.



Chapter 8

Water Supply

In southern Kern County, the California Aqueduct emerges from the Porter Tunnel and splits into the West and East branches.

Significant Events in 2011

Water year 2010–2011 proved to be significantly wet, with above-average precipitation and mountain snowpack. The State received precipitation at 135 percent of average in 2010–2011, compared to 108 percent of average in 2009–2010. The Northern Sierra 8-Station Precipitation Index recorded the wettest June precipitation totals on record. The statewide snowpack peaked at the end of March and then gradually declined as April was unusually cool and dry.

Statewide river runoff totaled 146 percent of average in the 2010–2011 water year. Runoff in the Sacramento River and San Joaquin River regions was 135 and 184 percent of average, respectively. Feather River unimpaired inflow to Lake Oroville was 6.6 million acre-feet (maf) (145 percent of average) for the water year, compared to 3.6 maf (79 percent of average) the previous year.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were both considered “wet,” based on all observed data for water year 2010–2011.

Information in this chapter was contributed by the Division of Flood Management and the Division of Operations and Maintenance.

The Department of Water Resources (DWR) monitors precipitation, calculates runoff, and operates storage facilities during each water year. The official California water year runs from October 1 through September 30. DWR works during the water year to fulfill its key contractual obligations to the State Water Project (SWP) long-term water supply contractors.

Water Year 2010–2011

Precipitation and Snowpack

California experienced above-average rainfall and mountain snowpack during water year 2010–2011. The state received precipitation at 135 percent of average in 2010–2011, compared to 108 percent of average in 2009–2010. Figure 8-1 presents water year precipitation for the various regions of the state. The Northern Sierra 8-Station Precipitation Index (for more about this, see the sidebar, Precipitation and Water Supply Indices) finished the water year with 72.7 inches of precipitation, which was 145 percent of average. The statewide average snow water equivalent, based on snow sensors, reported for April 1 was 47.7 inches, or 165 percent of average. Historically, April 1 is the average annual date of peak snow accumulation.

Table 8-1 presents monthly precipitation totals for water year 2010–2011 at various gauges located throughout the state, listed north to south. For much of the state, the two wettest months were December and March, where precipitation totals exceeded 150 percent of average.

Mount Shasta City in far Northern California received 51.1 inches of precipitation for a water year total that was 141 percent of average. Precipitation for Mount Shasta City was above normal for 7 months of the 2010–2011 water year. March accumulated the largest precipitation and percent of normal for the water year, with 16.1 inches and 367 percent, respectively. December's and March's large precipitation averages

were due to several major storms that occurred throughout the state, which brought significant amounts of rain and snowfall accumulation in the Sierra with windy conditions.

Blue Canyon experienced precipitation above normal for 8 months of water year 2010–2011. The month of March accumulated the largest precipitation and percent of normal for the water year, 25.8 inches, which was 304 percent of average. The month of June was the greatest percent of normal for the water year with 541 percent, which was 4.8 inches of precipitation.

The monthly totals for the Northern Sierra 8-Station Precipitation Index for the water year are presented in Table 8-2. Precipitation totaled 72.7 inches, which was 145 percent of average. Monthly precipitation totals for October and March, May, and June were well above average at 250, 271, 219, and 318 percent of average, respectively. March and June registered as the second and first, respectively, wettest months on record for the index. Following the wet June, the rest of the water year was quite dry and warm.

Taking the entire water year into consideration, 48 percent of the water year total precipitation fell during December and March, essentially during two storm periods. The first period of storms occurred during December, producing 16.4 inches of precipitation for the Northern Sierra 8-Station index. The month started cool and dry with high-pressure offshore, and by the end of the first week a low-pressure system brought widespread precipitation



Figure 8-1 Statewide Precipitation by Hydrologic Region, 2010–2011 Water Year, as Percent of Average

Table 8-1 Monthly Precipitation Totals at Various Locations in California during Water Year 2010–2011

Station ^a	Monthly Precipitation (inches)													Water Year 2011–2012		
	Water Year 2010–2011															
	2010			2011												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY Total	Oct	Nov	Dec
Mount Shasta City	4.77	2.97	12.84	0.83	6.80	16.14	1.37	3.23	1.54	0.26	0.00	0.31	51.06	2.27	3.46	0.46
percent of average	204	65	218	13	121	367	49	190	145	104	0	39	141	97	75	8
Eureka Woodley Island	4.26	4.69	10.08	2.23	3.62	11.88	4.07	1.43	1.29	0.17	0.04	0.37	44.13	4.21	3.86	2.22
percent of average	142	85	157	34	70	228	142	79	211	155	17	49	115	141	70	35
Blue Canyon (DWR-2)	10.98	12.22	21.88	3.92	10.92	25.83	5.10	5.86	4.76	0.00	0.00	0.09	101.56	5.33	3.67	0.33
percent of average	293	155	209	32	112	304	102	215	541	0	0	12	162	142	47	3
Sacramento WB City	1.43	2.39	5.55	1.36	3.39	7.00	0.08	1.40	1.14	0.00	0.00	0.00	23.74	1.72	0.87	0.07
percent of average	155	118	174	36	104	293	5	304	877	0	0	0	132	187	43	2
San Francisco WB AP	1.81	3.10	5.69	0.94	4.79	5.70	0.33	0.47	1.49	0.00	0.00	0.01	24.33	1.38	1.55	0.14
percent of average	171	131	153	21	146	207	23	107	993	0	0	5	122	130	65	4
Yosemite Headquarters	6.16	6.57	16.14	2.95	6.68	13.24	1.63	2.76	1.93	0.00	0.11	2.31	60.48	2.80	1.07	0.00
percent of average	358	156	245	44	107	268	50	196	339	0	55	373	165	163	25	0
Fresno WB AP	0.44	1.80	5.92	1.72	1.60	3.46	0.32	0.35	1.91	0.00	0.00	0.00	17.52	0.90	0.67	0.00
percent of average	92	162	336	86	77	187	30	125	2,729	0	0	0	161	188	60	0
Grant Grove	4.59	5.90	21.17	3.56	7.54	12.99	1.40	3.47	0.84	0.00	0.19	0.77	62.42	4.10	2.68	0.00
percent of average	234	114	271	48	104	172	32	297	300	0	271	143	143	209	52	0
Los Angeles-WSO AP	1.56	0.59	8.83	0.81	1.47	4.04	0.00	0.53	0.02	0.00	0.00	0.01	17.86	0.63	1.69	0.67
percent of average	411	42	420	30	50	215	0	379	40	0	0	6	140	166	120	32
San Diego NWS-Lindbergh	2.18	0.88	5.00	0.30	2.10	1.46	0.26	0.36	0.03	0.00	0.00	0.13	12.70	0.46	3.12	0.86
percent of average	519	78	262	15	109	91	34	171	43	0	0	72	122	110	276	45

^a AP = Airport; NWS = National Weather Service; WB = Weather Bureau; WSO = Weather Service Office; WY = Water Year (October 1–September 30)

Table 8-2 Northern Sierra 8-Station Precipitation Index for Water Year 2010–2011

	Month	Precipitation (inches)	Percent of Monthly Average
2010	October	7.50	250
	November	8.00	127
	December	16.44	196
	January	2.08	23
	February	8.49	106
	March	18.71	271
2011	April	3.15	81
	May	4.60	219
	June	3.18	318
	July	0.08	40
	August	0.00	0
	September	0.47	52
	Total	72.70	145

and mountain snow. By the end of the second week, a series of strong storms occurred throughout the state. The wet conditions were unusual for what is typical for La Niña conditions in the tropical Pacific. The second series of storms hit California in March, producing 18.7 inches of precipitation for the index. March started with dry conditions throughout most of the state, but by the middle of the first week, a storm system traveled throughout California. High precipitation led to localized flooding, while snow fell at low elevations. The storm systems in the fourth week included thunderstorms, hail, and a few small tornadoes.

Areas of the Central Valley received above-normal precipitation for the months of March, May, and June. Precipitation totals for

those months were 7.0, 1.4, and 1.1 inches, respectively, for Sacramento (293, 304, and 877 percent of average) and 3.5, 0.4, and 1.9 inches, respectively, for Fresno (187, 125, and 2,729 percent of average).

In the San Joaquin and Tulare Lake watersheds, precipitation in March comparable to the precipitation in the north. The March storms brought 268 percent of average precipitation at Yosemite Headquarters and 172 percent of average at Grant Grove. Water year precipitation totals at those two sites were above average with 165 and 143 percent for their respective annual averages. Further south, the cities of Los Angeles and San Diego were above average, totaling 140 and 122 percent of their annual averages for the water year, respectively.

The precipitation that fell during water year 2010–2011 resulted in a snowpack above average throughout the state’s mountainous regions. Monthly statewide snowpack for the water year is shown in Table 8-3. Snow water equivalents shown in the table were obtained from daily snow sensor reports corresponding to the first day of each month. The statewide average snow water equivalent reported for April 1 was 47.7 inches or 165 percent of average. Snowpack peaked at the end of March at approximately 48 inches of snow water content. The snowpack peaked slightly earlier than normal at 166 percent of average. April 1 is typically the average annual date of peak snow accumulation. June 1 had the greatest percent of average snow levels for the year, with 313.

Runoff and Storage

Statewide unimpaired runoff totaled 146 percent of average in the 2010–2011 water year. The monthly runoff totals for the Sacramento 4 Rivers, San Joaquin 4 Rivers, Tulare Lake 4 Rivers, and the Feather River are shown in Table 8-4. The

Table 8-3 Statewide Snowpack for Water Year 2010–2011

	Date	Snow Water Equivalent (inches)	Percent of Average	Percent of April 1 Average ^a
2010	October 1	0	0	0
	November 1	0	0	0
	December 1	6.4	133	22
	January 1	21.6	209	75
	February 1	23.1	129	80
2011	March 1	31.7	124	109
	April 1	47.7	165	165
	May 1	42.0	190	147
	June 1	26.8	313	96
	July 1	3.6	232	13
	August 1	0	0	0
	September 1	0	0	0

^a April 1 is the average date of peak statewide snowpack. This table is based on snow pillow (a device for measuring snowpack at automated reporting stations) data.

water year runoff totals for these regions were 135, 184, 192, and 142 percent of average, respectively.

From a water supply perspective, the most closely monitored period is April through July. April concluded with 163, 164, 190, and 179 percent of normal runoff for the Sacramento River, San Joaquin River, Tulare Lake regions, and the Feather River, respectively. By the end of July, the April–July runoff volumes had increased to 177, 181, 192, and 191 percent of average, respectively.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were both considered “wet,” based on all observed data for water year 2010–2011. (For more information about the hydrologic classifications, see the sidebar, Precipitation and Water Supply Indices.)

Table 8-4 Unimpaired Runoff for Water Year 2010–2011 (million acre-feet)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
SRR runoff	0.62	0.71	3.36	1.55	1.50	4.94	3.87	3.21	3.12	1.33	0.57	0.44	25.21
percent of average	120	80	191	60	57	172	163	141	247	221	136	107	135
SJR runoff	0.25	0.21	0.96	0.55	0.46	1.26	1.36	1.74	2.46	1.34	0.30	0.11	10.99
percent of average	420	160	366	123	99	205	164	122	223	297	242	175	184
TLR runoff	0.07	0.08	0.49	0.32	0.21	0.47	0.76	1.00	1.38	0.78	0.24	0.11	5.91
percent of average	147	115	403	176	107	176	190	138	221	265	235	185	192
Feather River runoff	0.14	0.15	0.79	0.36	0.37	1.11	1.17	0.98	0.91	0.35	0.15	0.10	6.58
percent of average	117	74	195	61	62	154	179	154	270	225	143	114	142
Statewide													
percent of average	170	90	198	68	65	187	158	130	234	265	175	129	146

SRR: Sacramento River Region
Sacramento River above Bend Bridge, Feather River at Oroville, Yuba River near Smartville, American River below Folsom Lake

SJR: San Joaquin River Region
Stanislaus River below Goodwin Dam, Tuolumne River below La Grange, Merced River below Merced Falls, San Joaquin River below Millerton Lake

TLR: Tulare Lake Region
Kings River below Pine Flat, Kaweah River below Terminus, Tule River below Lake Success, Kern River at Isabella

WY: Water Year (October 1–September 30)

During water year 2010–2011, statewide reservoir storage peaked near 130 percent of average in August following the near average 2009–2010 water year. Monthly storage totals for the major Sierra reservoirs are shown in Table 8-5. End-of-water-year storage in the major Sierra reservoirs ranged from 182 percent of average in the Pine Flat Reservoir on the Kings River to 84 percent of average in Kaweah Reservoir on the Kaweah River.

Water Year 2011–2012 October through December Water Conditions

The last three months of calendar year 2011 mark the beginning of a new water year, 2011–2012, as shown in Table 8-1. October proved to be above average for precipitation throughout the state. Grant Grove received 209 percent of average precipitation during October. By comparison, November and December were drier statewide and well below average for precipitation. December had extremely low precipitation, ranging

from 2.2 inches in Eureka to no precipitation in the central and southern regions.

At the end of October, water year runoff totals were 111, 238, and 253 percent of average for the Sacramento River, San Joaquin River, and Tulare Lake regions, respectively. By the end of December, runoff totals for the new water year were 49, 60, and 114 percent of average, respectively, for the same three regions.

State Water Project Storage

SWP operates a complex system of dams, canals, and reservoirs to collect and store water for future deliveries. Lake Oroville is the first of two primary SWP conservation facilities. Lake Oroville inflow comes from tributaries of the Feather River.

The San Luis Reservoir is the second primary SWP conservation facility. This Central California joint-use facility derives its inflow from pumping at the Gianelli Pumping-Generating Plant. San Luis is an off-stream storage reservoir. Most of the water is

Precipitation and Water Supply Indices

Northern Sierra 8-Station Precipitation Index

In the northern Sierra Nevada, precipitation is indexed by averaging rain gauge totals at eight representative stations, creating what is known as the Northern Sierra 8-Station Precipitation Index. The eight stations are: Mount Shasta City, Shasta Dam, Mineral, Quincy, Brush Creek, Sierraville Ranger Station, Blue Canyon, and Pacific House. The index provides a representative sample of the major watersheds (upper Sacramento, Feather, Yuba, and American rivers) and serves as a wetness index for the Sacramento River hydrologic region.

Sacramento River Runoff

Sacramento River runoff (Sacramento 4 Rivers) is the sum of unimpaired flow in million acre-feet (maf) at the Sacramento River above Bend Bridge, Feather River at Oroville (inflow to Lake Oroville), Yuba River near Smartville, and American River below Folsom Lake. The Sacramento Valley unimpaired runoff represents the natural water production of the Sacramento River basin, unaltered by upstream diversions, storage, or export of water to or import of water from other basins.

Also known as the “Sacramento River Index,” this index was previously used to determine year type classifications under State Water Resources Control Board (SWRCB) Water Right Decision 1485.

Eight River Index

This index is the sum of the unimpaired runoff from eight rivers—four in the Sacramento Valley (Sacramento River Runoff) and four in the San Joaquin Valley: the Stanislaus River below Goodwin Dam, Tuolumne River below La Grange, Merced River below Merced Falls, and San Joaquin River below Millerton Lake.

This index determines the duration of the fish and wildlife salinity and flow standards at Chipps Island or Port Chicago from February through June.

Sacramento Valley 40-30-30 Index

SWRCB Water Right Decision 1641 (D-1641) applies the Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index), a water supply forecasting tool, to derive the water year type for the Sacramento Valley. Previously, the Sacramento River Index was used to classify water years. SWRCB first introduced the Sacramento Valley 40-30-30 Index in the 1991 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), and continued using it with the 1995 Bay-Delta Plan. D-1641 implements portions of the 1995 Bay-Delta Plan with respect to the operation of the State Water Project and the Central Valley Project. The Sacramento Valley 40-30-30 Index is used to determine the Sacramento Valley water year type for the purpose of implementing water quality objectives defined in D-1641. It also provides an estimate of the potential water supply originating in the basin from rainfall and snowmelt runoff, groundwater accretion, and reservoir carryover storage. The Sacramento Valley 40-30-30 Index incorporates seasonal differences in water contribution for the year

and includes the prior year’s conditions in order to establish a more reliable index of water availability. The 40-30-30 factors represent the percentage weight given to the following:

- (1) 40%—the current year’s April through July Sacramento Valley unimpaired runoff;
- (2) 30%—the current year’s October through March Sacramento Valley unimpaired runoff; and
- (3) 30%—the previous year’s index with a cap of 10 maf (to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the Sacramento Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 9.2
Above Normal	Greater than 7.8 and less than 9.2
Below Normal	Equal to or less than 7.8 and greater than 6.5
Dry	Equal to or less than 6.5 and greater than 5.4
Critical	Equal to or less than 5.4

Water year types are set by the first-of-the-month forecasts beginning in February, and the Sacramento Valley 40-30-30 Index May 1 forecast determines the final water year type for implementing water quality and flow requirements contained in D-1641. The D-1641 objectives are conditioned by water year type and generally become less stringent during dryer years.

San Joaquin Valley 60-20-20 Index

D-1641 uses a similar method to determine the water year type for the San Joaquin Valley. The San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) uses (1) the current year’s April through July San Joaquin Valley unimpaired runoff (60 percent); (2) the current year’s October through March San Joaquin Valley unimpaired runoff (20 percent); and (3) the previous year’s San Joaquin Valley 60-20-20 Index (20 percent, with a cap of 4 maf to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the San Joaquin Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 3.8
Above Normal	Greater than 3.1 and less than 3.8
Below Normal	Equal to or less than 3.1 and greater than 2.5
Dry	Equal to or less than 2.5 and greater than 2.1
Critical	Equal to or less than 2.1

The San Joaquin Valley 60-20-20 Index May 1 forecast determines the water year type for D-1641 San Joaquin River Vernalis flow standards.

Table 8-5 Reservoir Storage for Water Year 2010–2011 (thousand acre-feet)

Reservoir	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta	3,272	3,224	3,489	3,490	3,784	4,032	4,266	4,487	4,402	4,035	3,619	3,341
percent of average	122	119	123	114	114	109	109	115	121	125	126	123
Oroville	1,702	1,638	2,180	2,439	2,684	2,840	3,305	3,400	3,515	3,499	3,309	3,045
percent of average	80	77	100	105	109	105	115	114	122	136	143	139
Folsom	602	550	442	479	613	635	751	880	928	932	839	740
percent of average	121	118	93	94	113	101	103	107	115	135	137	134
San Luis	911	1,143	1,533	1,905	2,006	2,035	2,026	1,831	1,825	1,686	1,493	1,516
percent of average	84	93	110	119	115	110	111	113	141	169	174	159
Pardee	170	165	193	195	192	199	199	199	200	194	190	183
percent of average	98	94	109	109	107	110	109	105	103	102	104	101
New Melones	1,281	1,317	1,480	1,601	1,694	1,941	1,986	2,092	2,300	2,276	2,142	2,052
percent of average	96	97	107	113	115	129	132	138	150	155	154	153
Don Pedro	1,643	1,666	1,716	1,625	1,639	1,727	1,584	1,722	1,917	2,016	1,781	1,632
percent of average	126	126	128	117	114	116	106	111	119	130	124	119
Millerton	210	292	438	397	407	431	229	277	484	492	423	356
percent of average	108	133	161	119	119	118	62	69	116	150	179	169
Pine Flat	351	409	634	646	687	779	663	706	963	910	714	614
percent of average	102	110	155	138	129	138	108	98	139	179	189	182
Kaweah	15	22	64	37	19	94	88	128	181	137	51	10
percent of average	136	171	406	177	78	231	116	106	170	266	265	84
Success	6	9	43	17	17	42	38	39	40	40	28	12
percent of average	69	94	339	99	71	129	86	72	80	117	145	99
Isabella	157	158	235	220	203	245	319	332	360	337	282	223
percent of average	96	101	148	127	110	122	138	111	115	123	131	119
Statewide												
percent of average	105	105	115	110	110	110	110	110	120	130	130	130

pumped into the reservoir from late fall to early spring. This water is temporarily stored, then released into the California Aqueduct to meet water contractor peaking demands in the summer months. The remaining SWP dams and reservoirs regulate the stored water supply in delivery patterns that are designed to fit local water demands.

Water Year 2010–2011 Storage Totals

At the end of the 2010–2011 water year, water storage in major SWP reservoirs and the State's share of joint-use reservoirs was 4.64 million acre-feet (maf) or 85 percent of maximum storage, compared to 2.81 maf

or 52 percent of maximum storage at the end of water year 2009–2010. The average end-of-month total storage for the 2010–2011 water year in major SWP reservoirs was 4.27 maf. End-of-water-year storage on September 30, 2011, at Lake Oroville was 3.05 maf, which was about 1.29 maf more than the previous water year. The State's share of San Luis Reservoir storage at the end of the 2010–2011 water year was 874,062 acre-feet (af), compared with 414,277 af in the previous water year. The combined storage in southern reservoirs was 584,945 af on September 30, 2011, compared with 555,202 af at the end of the 2009–2010 water year.

Calendar Year 2011 Storage Totals

The total storage in major SWP reservoirs was about 4.10 maf at the end of 2011, compared with 3.58 maf in 2010. The State's share of San Luis Reservoir storage was 964,240 af on December 31, 2011, compared with 802,515 af at the same time in 2010. The combined storage in the southern reservoirs was 586,234 af on December 31, 2011, compared with 601,004 af at the same time in 2010.

Lake Oroville

Lake Oroville has a maximum water storage capacity of 3,537,580 af. Runoff from the upper Feather River drainage, collected and stored in this reservoir, is released to the Sacramento-San Joaquin Delta through Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

Water Year 2010–2011 Inflow

Lake Oroville inflow for the 2010–2011 water year totaled about 6.23 maf, which was 147 percent of the average (4.24 maf) over the last 30 water years. Maximum daily inflow occurred on March 16, 2011, at 80,483 af. Minimum daily inflow occurred on September 22, 2011, at 64 af. Peak monthly total inflow occurred in April at 1,069,402 af, 17.2 percent of the water year total. The maximum total in the last 30 water years (1982–2011) was in water year 1982–1983 at 8,853,572 af. The minimum total in the same period was in water year 1991–1992 at 1,555,774 af.

Calendar Year 2011 Inflow

Figure 8-2 shows monthly Lake Oroville inflow for calendar years 2009, 2010, and 2011. Total Lake Oroville inflow during the calendar year was 5,661,437 af.

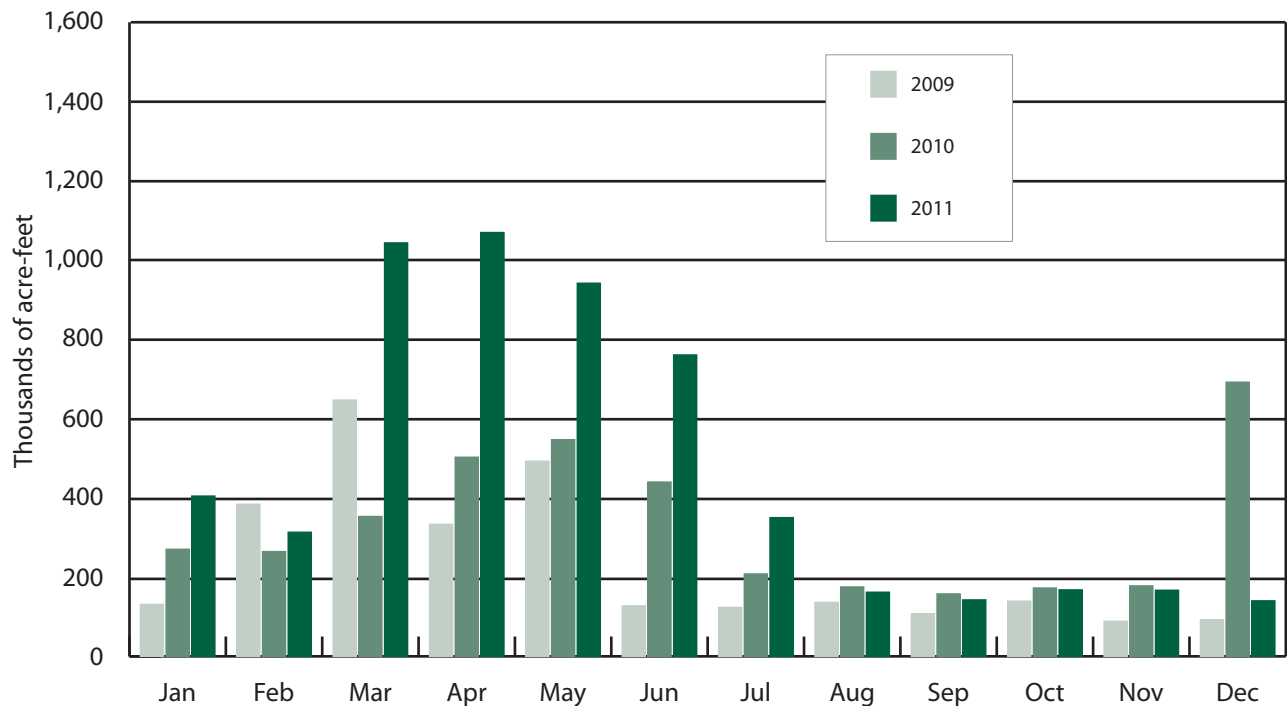


Figure 8-2 Monthly Inflow into Lake Oroville from the Feather River, 2009–2011 Calendar Years

Figure 8-3 shows historical (over the last 30 years) maximum and minimum cumulative Lake Oroville inflow for calendar years 1983 and 1994, and current cumulative inflow for 2011.

Calendar Year 2011 Storage

Minimum storage occurred on January 1, 2011, at 2,195,015 af, 62 percent of lake capacity. Maximum storage occurred on June 25, 2011, at 3,538,841 af, 100 percent of lake capacity. End-of-year Lake Oroville storage was 2,544,964 af.

Figure 8-4 compares end-of-month storage in Lake Oroville for the 2010 and 2011 calendar years.

2010–2011 Water Year San Luis Reservoir Operations

San Luis Reservoir is operated jointly by DWR and the Bureau of Reclamation pursuant to operating procedures adopted in

June 1981. San Luis Reservoir has a normal operating capacity of 2,027,840 af. The SWP share of this capacity is 1,062,183 af.

San Luis Reservoir reached its maximum water year total storage on March 26, 2011, at 2,035,210 af, 100 percent of its normal maximum operating capacity. At the beginning of the water year, San Luis Reservoir contained 788,588 af, 39 percent of its capacity. SWP storage share at the beginning of the water year was 414,277 af. The highest end-of-month SWP share of water storage for the 2010–2011 water year occurred on March 31, 2011, at 1,067,644 af. (See Figure 8-5.)

2010–2011 Water Year Lake del Valle Operations

Lake del Valle, located off the South Bay Aqueduct, functions primarily as a storage facility for water delivery to Santa Clara and Alameda counties. At the beginning of the water year, Lake del Valle held 36,194 af,

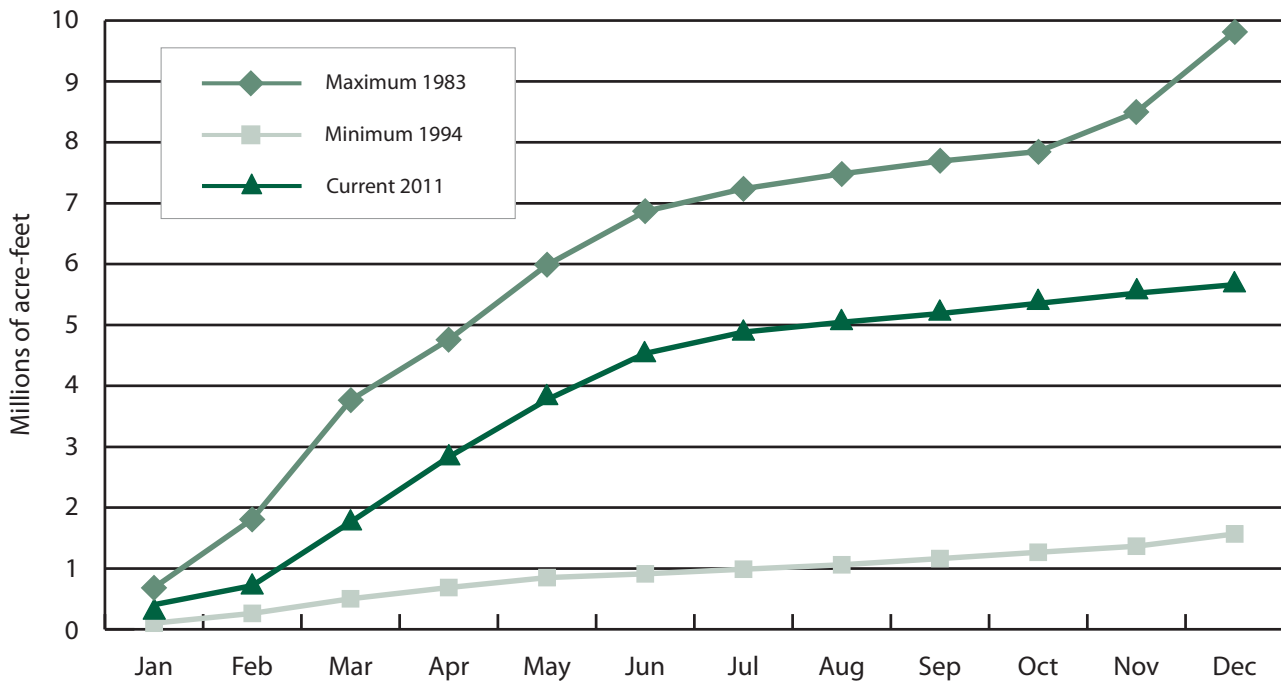


Figure 8-3 Lake Oroville Cumulative Inflow—Current and Historical (1982–2011) Maximum and Minimum

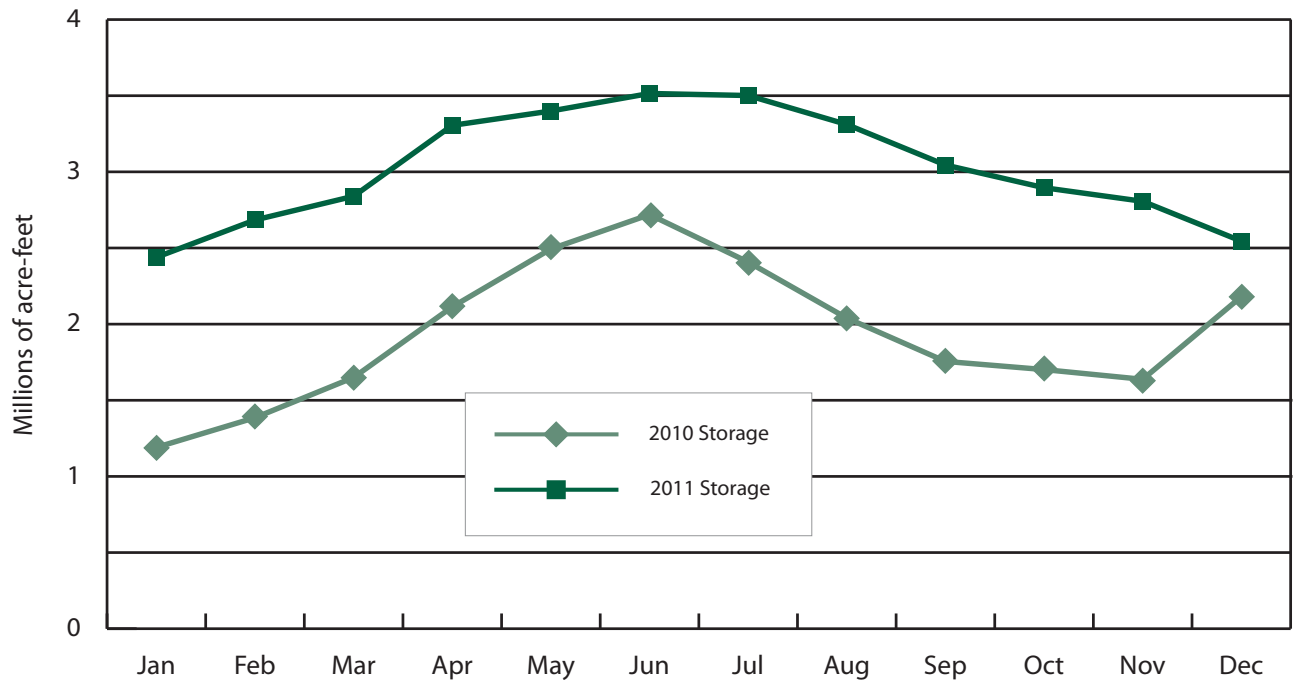


Figure 8-4 End-of-Month Storage in Lake Oroville, 2010 and 2011 Calendar Years

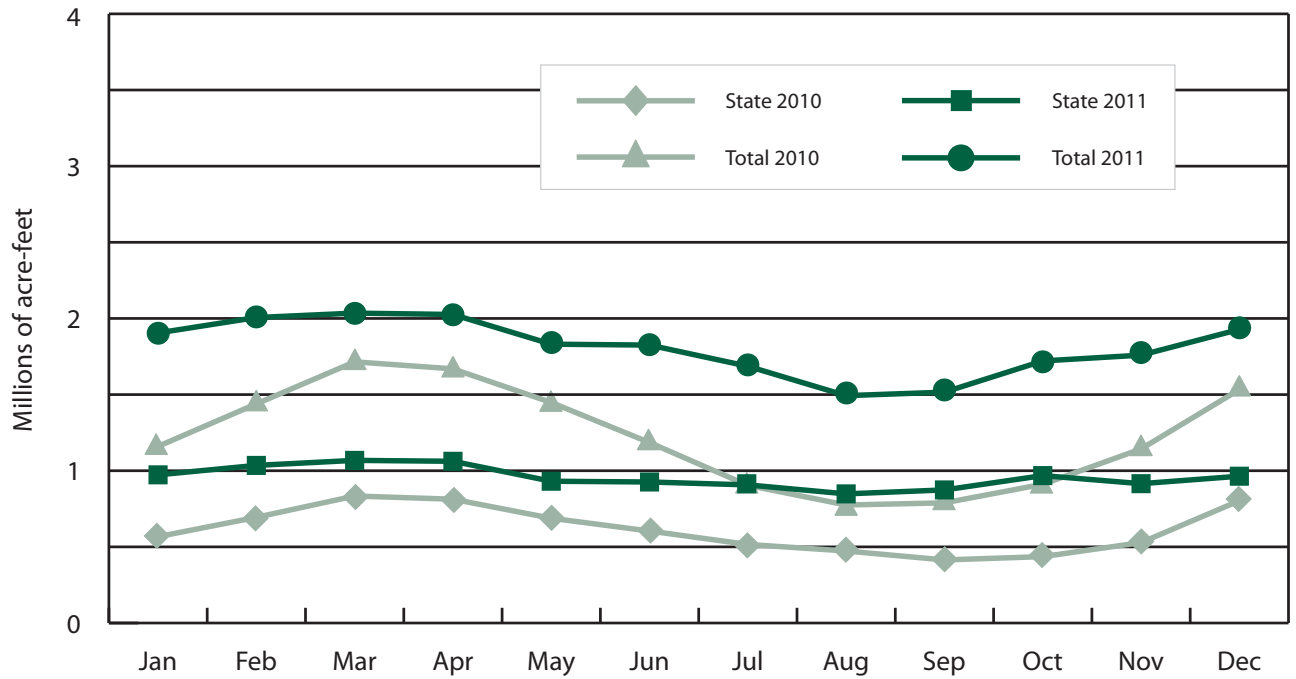


Figure 8-5 End-of-Month Storage in San Luis Reservoir, 2010 and 2011 Calendar Years

which was about 47 percent of its maximum capacity of 77,111 af. Its highest storage during the 2010–2011 water year occurred on June 10, 2011, at 41,244 af. Its lowest storage occurred on December 30, 2010, at 30,627 af.

By the end of the water year, on September 30, 2011, storage in Lake del Valle was 38,862 af, 50 percent of its maximum capacity. There was 33,044 af of natural inflow into Lake del Valle, and 2,862 af of inflow from the South Bay Aqueduct. There were 12,601 af of releases to Arroyo Valle, and releases for the water year to the South Bay Aqueduct from Lake del Valle totaled 17,751 af.

2010–2011 Water Year Southern Reservoir Operations

During normal operating conditions, DWR maintains its four southern reservoirs—Pyramid, Castaic, Silverwood, and Perris—at or near full operating capacity to ensure uninterrupted delivery of water to Southern California SWP contractors.

At the beginning of the water year, these reservoirs held 555,202 af, which is 81 percent of their combined normal maximum operating capacity of 689,021 af. At the end of the water year, the reservoirs held 584,945 af, 85 percent of combined normal maximum operating capacity.

Diversions from the Delta

The SWP diverts water from the Sacramento-San Joaquin Delta, through the Banks and Barker Slough pumping plants, for delivery to SWP water contractors' storage facilities. The Central Valley Project (CVP) diverts water to similar areas from the Delta through Jones Pumping Plant and Contra Costa Pumping Plant.

In 2011, the SWP diverted 3,879,762 af at Banks Pumping Plant. There was no Cross Valley Canal water or CVP water wheeled

at Banks Pumping Plant by DWR during calendar year 2011. The CVP diverted 2,475,437 af at Jones Pumping Plant and 100,140 af at Contra Costa Pumping Plant. The combined Delta exports include all of these plants. Figure 8-6 shows the amounts of water pumped each month in 2011 at Banks Pumping Plant. Figure 8-7 shows the monthly amounts of water diverted from the Delta in 2011 by the SWP and CVP.

Water is delivered from Banks Pumping Plant to the South Bay Area through the South Bay Aqueduct, and to the San Joaquin Valley, Central Coastal, and Southern California areas through the California Aqueduct. The SWP diverts water from Barker Slough Pumping Plant to the North Bay Aqueduct. In calendar year 2011, the North Bay Aqueduct received 40,112 af of water from the Barker Slough Pumping Plant.

Dos Amigos Pumping Plant diverts water from O'Neill Forebay to the California Aqueduct. Figure 8-8 shows monthly total amounts pumped at Dos Amigos Pumping Plant for calendar year 2011. The monthly total amount pumped at Dos Amigos Pumping Plant peaked in July 2011 at 648,115 af for the calendar year.

Maximum daily Delta exports occurred on January 8, 2011, at 25,129 af. Combined SWP and CVP monthly Delta exports in 2011 varied from a low of 210,509 af in May, to a high of 708,463 af in August. In 2011, Delta exports totaled approximately 6.5 maf.

In 2011, water pumped through the Edmonston Pumping Plant for delivery to Southern California totaled 1,682,759 af. Figure 8-9 shows the amount of water pumped each month in calendar year 2011.

Additional water supply information can be found on DWR's website.

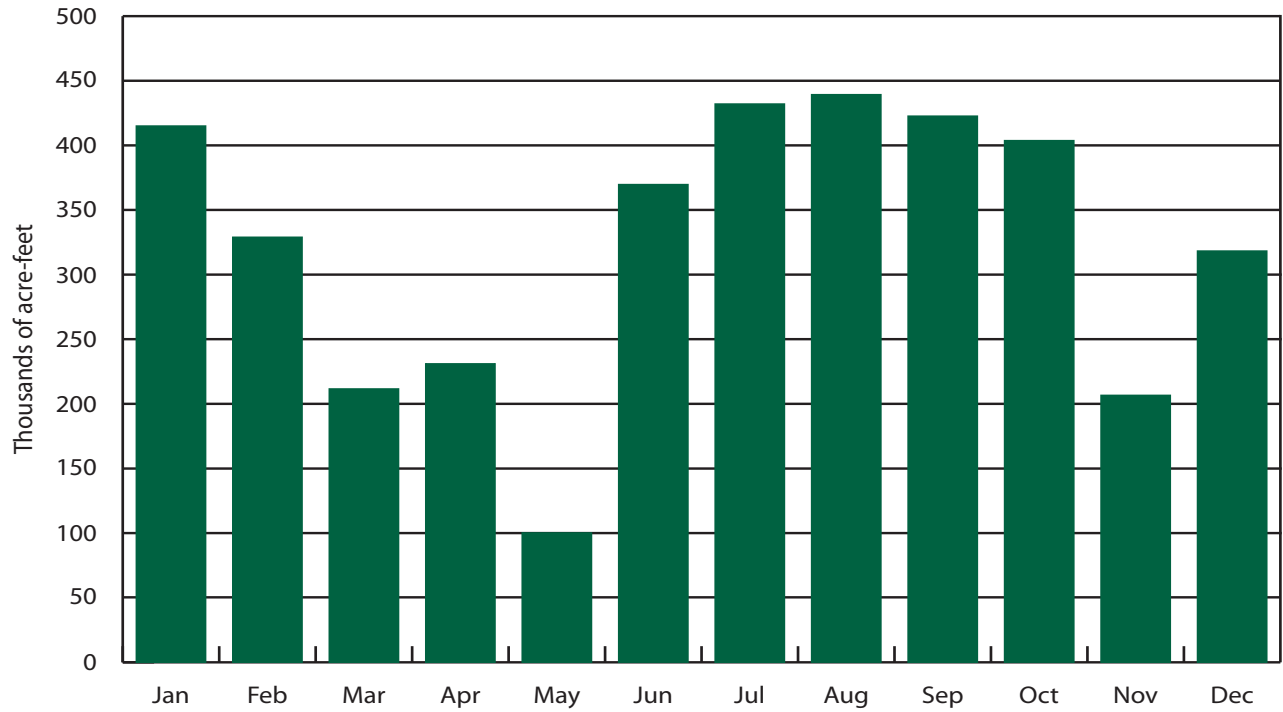


Figure 8-6 Water Pumped at Banks Pumping Plant, 2011 Calendar Year

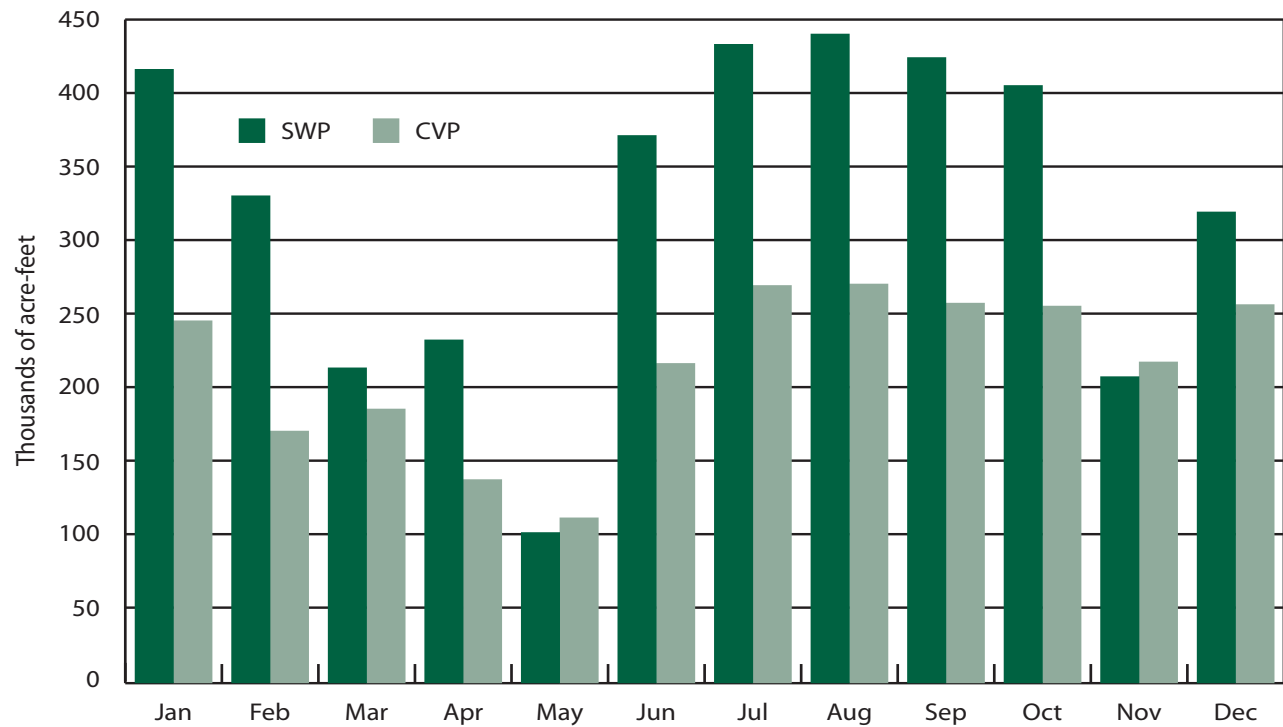


Figure 8-7 Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2011 Calendar Year

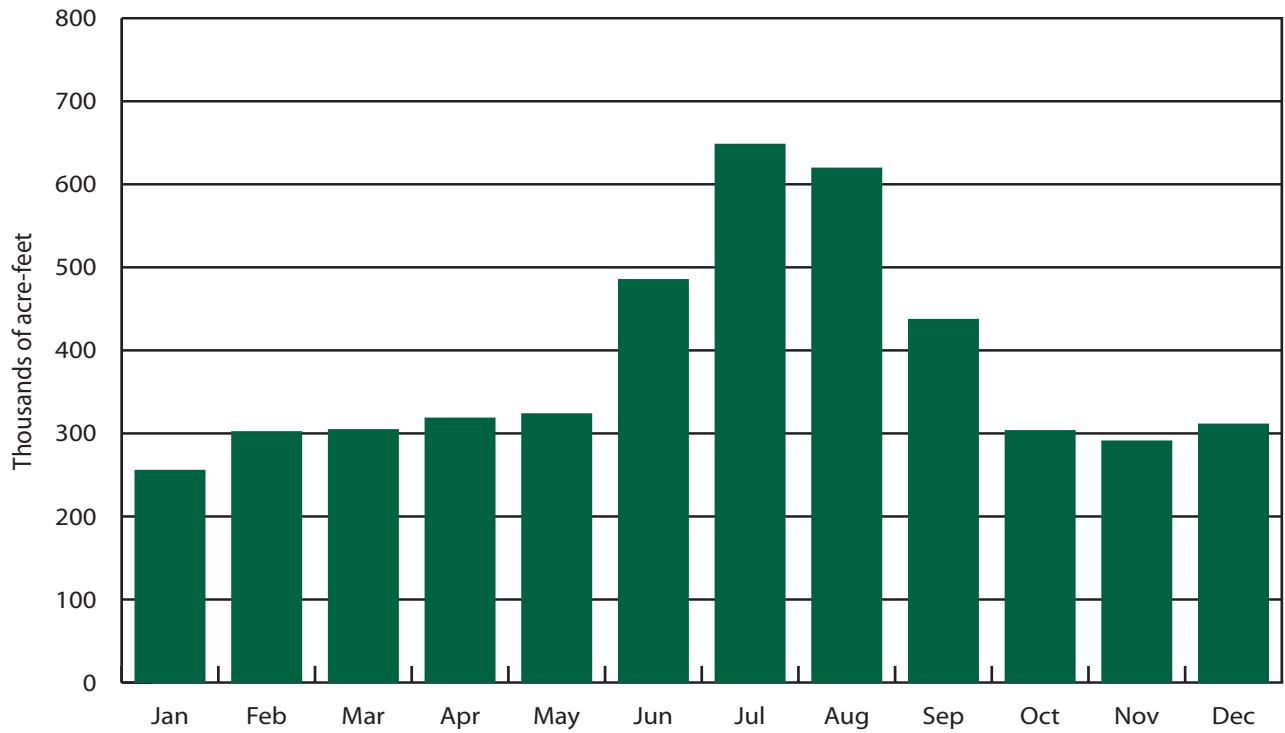


Figure 8-8 Water Pumped at Dos Amigos Pumping Plant, 2011 Calendar Year

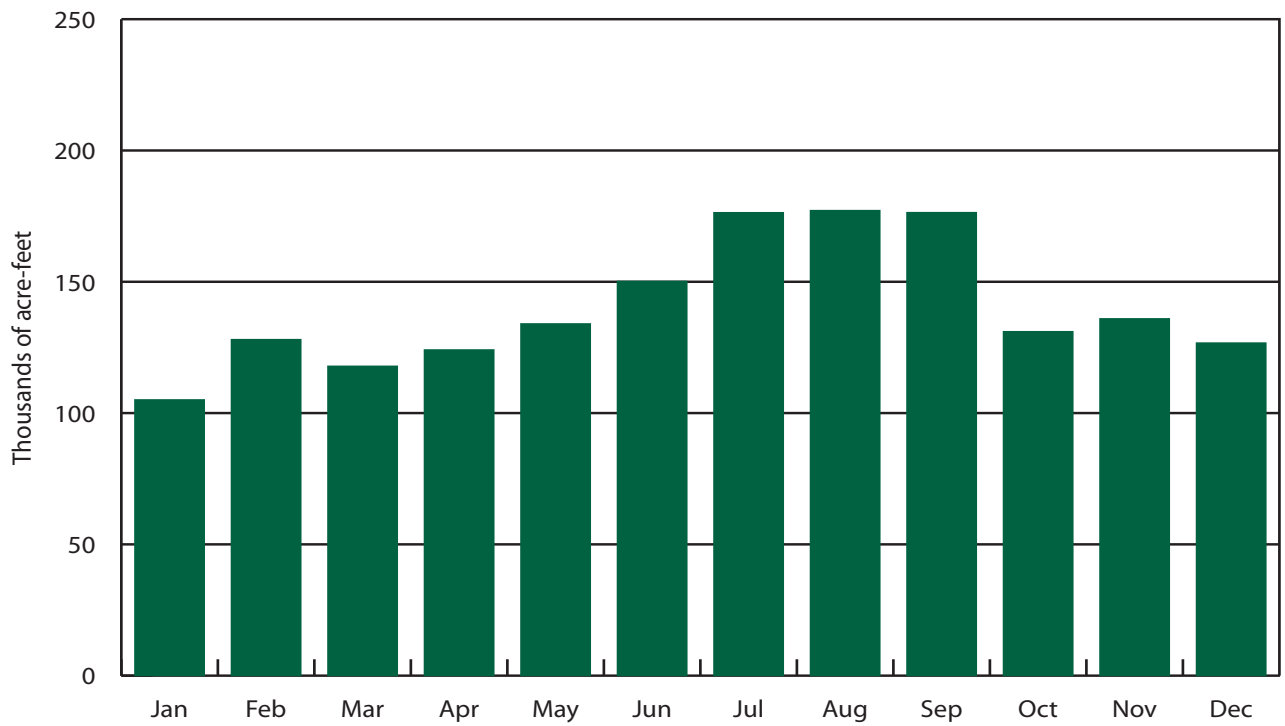


Figure 8-9 Water Pumped at Edmonston Pumping Plant, 2011 Calendar Year



Chapter 9

Water Contracts and Deliveries

Quail Lake and Canal.

Significant Events in 2011

The hydrologic conditions were classified as “wet” in both the Sacramento River watershed and in the San Joaquin River watershed in 2011. As a result, the Department of Water Resources (DWR) approved 80 percent of the State Water Project (SWP) water contractors’ Table A allocation requests, totaling 3,338,000 acre-feet (af).

The Article 21 Water Program allows SWP water contractors to take delivery of water exceeding the approved and scheduled Table A amounts. In 2011, a total of 420,814 af of Article 21 water was delivered to 10 SWP water contractors.

In 2011, a total of 4,630,798 af of State Water Project (SWP) and non-SWP water was delivered to 29 long-term SWP water contractors and 24 other agencies. The portion delivered to SWP water contractors was 3,348,931 af; the portion to non-SWP agencies was 1,281,867 af.

Information for this chapter was provided by the State Water Project Analysis Office.

The long-term water supply contracts between the Department of Water Resources (DWR) and 29 public agencies and local water districts provide for water service from the State Water Project (SWP) and are the basis for the SWP's construction and on-going operations. The State provides SWP financing, capital construction, improvements, and all operations and maintenance of SWP facilities, and the agencies and local districts have contractually agreed to repay all associated costs.

The water supply contracts also set forth the maximum amount of water a contractor may request each year from the SWP, and these water amounts are written within the contracts in a list format known as Table A. "Table A" or "Table A water" represents a portion or all of the annual Table A requested by SWP water contractors and approved for delivery by DWR based on hydrologic conditions, current reservoir storage, and combined requests from the SWP water contractors. Under certain conditions, DWR is not able to deliver the quantity of water requested by contractors. In these years, a proportional amount is allocated and delivered according to the long-term water supply contracts by prorating the amount in proportion to each SWP water contractor's maximum Table A amount. Table A amounts may also be used as a factor to allocate other available water supplies to each contractor. Approved Table A amounts may also be referred to in this chapter as "approved amounts," "approved water," or "allocated water."

The long-term water supply contracts are amended as needed.

DWR also enters into agreements with SWP water contractors and other agencies, which may be amended periodically, to convey SWP and non-SWP water through the California Aqueduct and to approve the construction, operation, and maintenance of SWP facilities and turnouts/turn-ins. These agreements are also listed in this chapter.

The State Water Project Analysis Office (SWPAO) developed a numbering system for contracts, amendments, and agreements executed by DWR. These numbers, referred to as SWPAO numbers, are designated in Chapter 9 text as "SWPAO #XXXXX" and are located in parentheses after each contract, amendment, or agreement description. These numbers can be used as an identifier for anyone who contacts DWR staff for more detailed information on a particular document.

Amendments to Long-term SWP Water Supply Contracts

All the original long-term water supply contracts signed by DWR, public agencies, and local water districts have been previously amended to incorporate mutually desired changes. Most amendments fall under the following general categories:

- (1) permanent transfers of Table A amounts from one SWP water contractor to another;
- (2) allocation of costs and benefits for the addition or enlargement of SWP facilities;
- (3) purchase of excess capacity in the California Aqueduct; and
- (4) provisions to implement Monterey Agreement principles.

State Water Project Long-term Water Supply Contracts

The first water supply contract was signed with The Metropolitan Water District of Southern California (Metropolitan) on November 4, 1960. The contract was negotiated by the Department of Water Resources (DWR) and Metropolitan according to terms of the contracting principles for water service contracts announced by the Governor on January 20, 1960.

The Metropolitan contract became the prototype for all water contracts; by the end of 1967, 31 agencies had contracted for water. In addition, a water supply contract was executed with the City of West Covina in December 1963, but was terminated in August 1965; the city's Table A amount was transferred to Metropolitan through an amendment to the district's long-term contract with DWR. Long-term contracts with Hacienda Water District and Devil's Den Water District were also terminated when those districts transferred their Table A amounts, through contract amendments, to Tulare Lake Basin Water Storage District (1981) and Castaic Lake Water Agency (1992), respectively. Today the State Water Project (SWP) has long-term water supply contracts with 29 agencies. Those contracts have been amended periodically to incorporate mutually agreed upon modifications.

All water contracts signed in the 1960s included an estimate of the date water would first be delivered and a schedule of the amount of water the agency could expect to be delivered annually (annual Table A amounts). That amount was designed to increase gradually until the maximum amount of annual Table A was reached. The total combined maximum annual Table A amount for all water contracting agencies was initially 4,230,000 acre-feet (af), assuming full development of the SWP.

The contracts were initially designed to be valid for 75 years or until all bonds sold as part of the California Water Resources Development Bond Act were repaid, whichever period was longer. As a result of amendments to contracts in the 1990s, the current combined maximum annual Table A amount totals 4,172,786 af, and the contracts are in effect for the longest of the following periods: (1) the project repayment period, which extends to 2035; (2) 75 years from the date of the contract; or (3) the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

2011 Amendments to Long-term Water Supply Contracts

There were no amendments to the long-term water supply contracts in 2011.

Monterey Amendments

The Monterey Amendments increase the reliability of existing water supplies, and increase water management flexibility,

providing more tools for local water agencies to maximize use of existing facilities.

The Monterey Amendments include changes in allocation of Table A water, the transfer of Table A amounts and land, financial restructuring, and increased operational flexibility. The Monterey Amendments are discussed in detail in Chapter 1, Summary of Significant Events, Bulletin 132-95, found on the DWR website.

Plumas County Flood Control and Water Conservation District (Plumas) and Empire-West Side Irrigation District (Empire) remain the only long-term SWP water contractors who have not signed the Monterey Amendments.

In accordance with the terms of the May 5, 2003, Monterey Settlement Agreement, the SWP continues to operate pursuant to the Monterey Amendments while the new environmental impact report (EIR) is being prepared. The draft EIR was released in October 2007 and is available on DWR's website. The final EIR was released in February 2010, and a notice of determination to proceed with the project was filed in June 2010. DWR's decision was to continue to operate the SWP under the existing Monterey Amendments pursuant to the SWP long-term water supply contracts, including the Kern Water Bank transfer, and under the settlement agreement entered in the Planning and Conservation League (PCL) v. DWR lawsuit. DWR's decision was challenged by two groups of plaintiffs on issues relating to the adequacy of the EIR and the validity of the Monterey Amendments. The cases are currently being heard by the trial court. Final resolution of the issues is likely to take a number of years.

The settlement agreement is discussed in detail in Chapter 9, Water Contracts and Deliveries, Bulletin 132-04 (available on DWR's website).

See Chapter 6, Legislation and Litigation, for the current status of the Monterey Amendment litigation.

Miscellaneous Agreements with Long-term SWP Water Contractors

2011 Water Conveyance and Exchange Agreements

Water conveyance and exchange agreements that were executed or pending execution with long-term SWP water contractors during 2011 are described below.

Alameda County Flood Control and Water Conservation District, Zone 7

An amendment executed April 21, 2011, to the 2000 point of delivery agreement among DWR, Kern County Water Agency (Kern), and Alameda County Flood Control and Water Conservation District, Zone 7 (Alameda-Zone 7), extends the term for the recovery of Alameda-Zone 7's stored water to December 31, 2035. The 2000 point of delivery agreement (SWPAO #00037) approved the delivery of a portion of Alameda-Zone 7's 2000 approved SWP water supplies for storage under the Semitropic Water Banking and Exchange Program, and the delivery for the return of the stored water to Alameda-Zone 7 by December 31, 2010. No water was moved under this agreement in 2011. (SWPAO #00037-A)

Alameda County Water District

A long-term point of delivery agreement executed March 16, 2011, among DWR, Alameda County Water District (Alameda County), and Kern, provides for the delivery of a portion of Alameda County's approved SWP water supplies to Kern for storage under the Semitropic Groundwater Banking and Exchange Program. The agreement allows delivery to storage in the groundwater basin underlying Semitropic Water Storage District (Semitropic) through December 31, 2020, and return of the stored water to Alameda County by December 31, 2035. During 2011, a total of 21,400 acre-feet (af)

of Alameda County's SWP water was delivered to storage, of which 13,000 af was Table A water, 5,380 af was Article 56(c) water, 1,061 af was Article 14(b) water, and 1,959 af was Article 21 water. (SWPAO #10009)

Castaic Lake Water Agency

An amendment executed November 3, 2011, to the 2002 point of delivery agreement among DWR, Castaic Lake Water Agency (Castaic Lake), and Kern, extends the term for the recovery of Castaic Lake's stored water in Semitropic to December 31, 2022. The 2002 point of delivery agreement (SWPAO #02015) allowed Castaic Lake to store up to 24,000 af of its 2002 Table A water under the Semitropic Water Banking and Exchange Program, and to recover the stored water by December 31, 2012. No water was moved under this agreement in 2011. (SWPAO #02015-A)

An amendment executed November 3, 2011, to the 2003 point of delivery agreement among DWR, Castaic Lake, and Kern, extends the term for the recovery of Castaic Lake's stored water in Semitropic to March 31, 2024. The 2003 point of delivery agreement (SWPAO #03060) allowed Castaic Lake to store up to 35,000 af of its 2003 Table A water under the Semitropic Water Banking and Exchange Program, and to recover the stored water by March 31, 2014. No water was moved under this agreement in 2011. (SWPAO #03060-A)

A letter agreement dated March 17, 2011, and executed August 22, 2011, among DWR, Castaic Lake and Kern, provides for the delivery of up to 19,000 af of Castaic Lake's approved SWP water supplies to Kern before December 31, 2011. In exchange, Kern will return 50 percent of the total amount of water delivered to Kern, up to 9,500 af of its future approved SWP water supplies, to Castaic Lake by December 31, 2021. During 2011, a total of 5,608 af of Castaic Lake's

Article 56(c) water was delivered to Kern. (SWPAO #11010)

A letter agreement pending execution among DWR, Castaic Lake, and Kern, will provide for the delivery of up to 5,000 af of Castaic Lake's approved SWP water supplies to Kern through December 31, 2012. In exchange, Kern will return 50 percent of the total amount delivered to Kern, up to 2,500 af of its future SWP water supplies, to Castaic Lake by December 31, 2022. During 2011, a total of 5,000 af of Castaic Lake's Table A water was delivered to Kern. (SWPAO #11016)

Dudley Ridge Water District

A multiyear exchange agreement executed March 14, 2011, among DWR, Dudley Ridge Water District (Dudley Ridge) and Kern, approves multiyear water exchanges and same landowner transfers between Dudley Ridge and Kern through December 31, 2020. This agreement allows for the delivery of a portion of either: (1) Dudley Ridge's or Kern's approved Table A water to the other party in exchange for the return of future Table A water, or (2) Dudley Ridge's and/or Kern's approved Table A water for same landowner transfer to the other party without any expected return. Dudley Ridge and Kern will establish an Exchange Account to track the water deliveries to Dudley Ridge and/or Kern under this agreement on a yearly basis. No water was moved under this agreement in 2011. (SWPAO #10007)

A multiyear same landowner transfer agreement executed June 13, 2011, among DWR, Dudley Ridge and Kern, provides for the delivery of a portion of Dudley Ridge's approved Table A water for same landowner transfers to Kern without any expected return through December 31, 2020. During 2011, a total of 3,400 af of Dudley Ridge's Table A water was delivered to Kern. (SWPAO #10030)

Empire-West Side Irrigation District

A long-term change in place of use agreement executed March 3, 2011, among DWR, Empire-West Side Irrigation District (Empire) and Westlands Water District (Westlands), approves annual delivery of up to 2,000 af of Empire's Table A water to Westlands through April 1, 2027. This transfer was made on behalf of two landowners, Brooks Farms and Newton Brothers, who farm in both Empire and Westlands' service areas. DWR petitioned the State Water Resources Control Board (SWRCB) for a temporary change in place of use. The SWRCB issued an order approving the petition on November 21, 2011. No water was delivered to Westlands under this agreement in 2011. (SWPAO #10008)

A contract executed February 25, 2011, between DWR and Empire, provided for the delivery of unscheduled water to Empire in 2011 at times when SWP water is not needed for fulfilling Table A deliveries or for meeting project operational commitments. During 2011, a total of 138 af of unscheduled water was delivered to Empire. (SWPAO #11001)

A letter agreement dated April 7, 2011, and executed April 13, 2011, between DWR and Empire, approved the transfer of up to 2,000 af of Empire's 2011 Table A water to Westlands. The transfer was made on behalf of landowners, Brooks Farms and Newton Brothers, who farm in both Empire's and Westlands' service areas. DWR petitioned SWRCB for a temporary change in place of use. The SWRCB issued Order WR 2011-0010-DWR approving the petition on April 1, 2011, for the transfer in 2011 only. For subsequent years, a long-term agreement providing for the same landowner transfer is described above (SWPAO #10008). During 2011, a total of 400 af of Empire's Table A was delivered to Westlands under this agreement. (SWPAO #11009)

Kern County Water Agency

A multiyear conveyance agreement executed December 14, 2011, among DWR, Kern and City of Tracy (Tracy), provides for the conveyance of up to 10,500 af per year of Tracy's Central Valley Project (CVP) water to Kern for storage under the Semitropic Water Banking and Exchange Program through December 31, 2029. In exchange, Kern will return up to 3,500 af annually of its Table A water to Tracy through December 31, 2030. No water was delivered to Kern under this agreement in 2011. (SWPAO #10031)

A letter agreement dated July 15, 2011, and executed August 19, 2011, between DWR and Kern, approves the conveyance of up to 53,300 af of Kern-Tulare Water District's (Kern-Tulare) 2011 (CVP water to Kern under Article 55 of Kern's long-term water supply contract, effective March 1, 2011, through February 29, 2012. No water was delivered to Kern under this agreement in 2011. (SWPAO #11002)

A letter agreement dated December 15, 2010, and executed February 11, 2011, between DWR and Kern, provided for the conveyance of up to 7,000 af of Kern's 2010 Table A water for use at the Kern National Wildlife Refuge on behalf of the Bureau of Reclamation (Reclamation). This agreement completed the exchange that began with Reclamation acquiring Kern-Tulare's Friant-Kern water previously stored in Rosedale-Rio Bravo Water Storage District (Rosedale-Rio), a member unit of Kern. The conveyance was completed in December 2010. (SWPAO #10026)

A letter agreement dated November 4, 2011, and executed December 6, 2011, between DWR and Kern, provided for the conveyance of up to 25,000 af of Friant Recirculation Water associated with the San Joaquin River Restoration Program to Kern. Four member units of Kern purchased this nonproject water from the Friant Division

CVP contractors to firm up their future in-district supplies. Reclamation made this nonproject water available at O'Neill Forebay for DWR to convey to Kern under Article 55 of Kern's long-term water supply contract. During 2011, a total of 18,018 af of water was delivered to Kern under this agreement. (SWPAO #11017)

Littlerock Creek Irrigation District

A letter agreement dated January 12, 2011, and executed January 24, 2011, among DWR, Littlerock Creek Irrigation District (Littlerock), and Antelope Valley-East Kern Water Agency (AVEK), approves an exchange of up to 1,150 af of Littlerock's 2010 Table A water with AVEK's future allocated Table A water. AVEK will return an equal amount of its future Table A water to Littlerock by December 31, 2020. No water was moved under this agreement in 2011. (SWPAO #10035)

The Metropolitan Water District of Southern California

A letter agreement dated March 9, 2011, and executed April 5, 2011, among DWR, The Metropolitan Water District of Southern California (Metropolitan), and Santa Clara Valley Water District (Santa Clara), approves the delivery of up 9,000 af of Santa Clara's 2010 Table A, Article 56(c) water stored in San Luis Reservoir to Metropolitan. In exchange, Metropolitan will return an equal amount of its future Table A water to Santa Clara by December 31, 2014. During 2011, a total of 8,341 af of Santa Clara's Article 56(c) water was delivered to Metropolitan. (SWPAO #11007)

A change in point of delivery agreement executed September 8, 2011, among DWR, Metropolitan, and Mojave Water Agency (Mojave), provides for the delivery of up to 390,000 af of Metropolitan's approved SWP water supplies to Mojave for temporary storage in the Mojave River Basin, and for the equivalent return of such water by in-lieu

exchange of Mojave's approved SWP water supplies. The agreement allows deliveries of Metropolitan's water to Mojave through December 31, 2034, and return of stored water to Metropolitan by December 31, 2035. During 2011, a total of 45,048 af of Metropolitan's Table A water was delivered to Mojave. (SWPAO #11011)

Palmdale Water District

A letter agreement pending execution among DWR, Palmdale Water District (Palmdale), and AVEK, provides for the delivery of up to 10,000 af of Palmdale's 2011 SWP water supplies to AVEK. In exchange, AVEK will return 50 percent of the total amount delivered to AVEK, up to 5,000 af, of its future SWP water supplies to Palmdale by December 31, 2021. During 2011, a total of 2,980 af of Palmdale's Table A water was delivered to AVEK. (SWPAO #11020)

San Bernardino Valley Municipal Water District

A change in point of delivery agreement pending execution among DWR, Kern, and San Bernardino Valley Municipal Water District (San Bernardino), will provide for the delivery of up to 30,000 af of San Bernardino's 2011 Table A water to Kern for storage in the groundwater basin underlying Kern Delta Water District, a member unit of Kern, and for the return of up to 5,000 af per year of stored water to San Bernardino by December 31, 2035. During 2011, a total of 8,066 af of San Bernardino's Table A water was delivered to Kern under this agreement. (SWPAO #11015)

Santa Barbara County Flood Control and Water Conservation District

A letter agreement dated February 28, 2011, and executed May 16, 2011, among DWR, Santa Barbara County Flood Control and Water Conservation District (Santa Barbara), and Palmdale, approved the exchange of up to 7,000 af of Santa Barbara's 2010 carryover

water with Palmdale's future Table A water. To prevent the potential loss in the event that San Luis Reservoir would spill, Santa Barbara's 2010 carryover water was provided to Palmdale at O'Neill Forebay and subsequently delivered to Kern to facilitate a partial return of a previous water exchange between Palmdale and West Kern Water District (West Kern), a member unit of Kern. (SWPAO #07029, Bulletin 132-09) Palmdale will return all water to Santa Barbara by December 31, 2021. During 2011, a total of 2,548 af of Santa Barbara's Article 56(c) water was made available to Palmdale for subsequent delivery to Kern. (SWPAO #11006)

A letter agreement pending execution among DWR, Santa Barbara, and Kern, will provide for the delivery of up to 17,000 af of Santa Barbara's 2011 SWP water supplies to Kern, in exchange for the return of Kern's future approved SWP water supplies equal to two-thirds, less losses, of the total amount delivered to Kern. The return of Kern's water to Santa Barbara will be completed by December 31, 2021. During 2011, a total of 11,895 af of Santa Barbara's water was delivered to Kern. (SWPAO #11018)

A letter agreement dated November 10, 2011, and executed November 28, 2011, among DWR, Santa Barbara, and Dudley Ridge, approved the delivery of up to 3,000 af of Santa Barbara's 2011 SWP water supplies to Dudley Ridge. In exchange, Dudley Ridge will return two-thirds, less losses, of its future approved SWP water supplies to Santa Barbara. The water under this agreement will be delivered to Kern's turnouts on behalf of Dudley Ridge pursuant to a previous 2008 agreement among DWR, Dudley Ridge, and Kern, which allows delivery of Dudley Ridge's SWP supplies to the Kern Water Bank for storage (SWPAO #08050). The return of Dudley Ridge's water to Santa Barbara will be completed by December 31, 2021. During 2011, a total of 2,957 af of Santa Barbara's water was provided to Dudley Ridge, of which 2,900 af was delivered to Kern's turnouts. (SWPAO #11019)

Santa Clara Valley Water District

A letter agreement dated February 16, 2011, and executed June 13, 2011, among DWR, Santa Clara, and Kern, provides for the delivery of up to 40,000 af of Santa Clara's 2010-2011 CVP water to Kern's service area for storage in Semitropic by February 28, 2011, and the future return of a like amount of water. Reclamation will make Santa Clara's CVP water available at O'Neill Forebay for conveyance to Semitropic by DWR pursuant to Article 55 of Santa Clara's long-term water supply contract. Semitropic will return a like amount of water, less losses, to Santa Clara by December 31, 2035. No water was moved under this agreement in 2011. (SWPAO #10029)

A letter agreement dated February 17, 2011, and executed May 5, 2011, between DWR and Santa Clara, approved the delivery of up to 30,000 af of SWP water supplies to Santa Clara. In exchange, Reclamation will make an equal amount of Santa Clara's 2010 or 2011 CVP water supplies available to DWR at O'Neill Forebay. DWR will deliver the CVP water to SWP service areas south of O'Neill Forebay. DWR petitioned SWRCB for the consolidation of SWP and CVP places of use. The SWRCB issued Order WR-2010-0032-DWR approving the petition on November 5, 2010. During 2011, a total of 5,000 af of SWP water was delivered to Santa Clara. (SWPAO #10034)

A multiyear agreement executed November 22, 2011, among DWR, Santa Clara, and Kern, approves the conveyance of up to 100,000 af per year of Santa Clara's approved CVP water supplies to Kern for storage under the Semitropic Water Banking and Exchange Program through December 31, 2022. Semitropic will return a like amount of water, less losses, to Santa Clara by December 31, 2035. Reclamation will make Santa Clara's CVP water available at O'Neill Forebay for conveyance to Semitropic by DWR under Article 55 of

Santa Clara's long-term water supply contract. During 2011, a total of 36,411 af of Santa Clara's CVP water was delivered to Semitropic under this agreement. (SWPAO #11012)

Tulare Lake Basin Water Storage District

A long-term change in place of use agreement executed January 7, 2011, among DWR, Tulare Lake Basin Water Storage District (Tulare) and Westlands, approves the delivery of up to 8,000 af per year of Tulare's Table A water to Westlands' turnouts through April 1, 2027. The transfer was made on behalf of two landowners, Hansen Ranches and Newton Farms, who farm in both Tulare's and Westlands' service areas. DWR petitioned SWRCB for a temporary change in place of use. The SWRCB issued an order approving the petition on November 21, 2011. No water was delivered to Westlands in 2011. (SWPAO #10006)

A letter agreement dated March 21, 2011, and executed May 6, 2011, among DWR, Tulare, and Kern, approved the transfer of up to 10,000 af of Tulare's 2011 Table A water to Kern on behalf of JG Boswell Company, a landowner with farms in both Tulare's and Kern's service areas. This transfer allowed Boswell to augment its Kern water supply to meet crop requirements. No water was delivered to Kern under this agreement in 2011. (SWPAO #11003)

A letter agreement dated March 21, 2011, and executed May 24, 2011, among DWR, Kern, and Tulare, approved the transfer of up to 5,000 af of Tulare's 2011 Table A water to Kern. The transfer was made on behalf of Sandridge Partners Incorporated, a landowner with farms in both Tulare's and Kern's service areas. An amendment dated August 22, 2011, and executed September 27, 2011, increased the amount of Tulare's 2011 Table A water delivered to Kern to 6,000 af. During 2011, a total of 6,000 af of Tulare's Table A water was delivered to Kern. (SWPAO #11004 and SWPAO #11004-A)

A letter agreement dated March 21, 2011, and executed April 22, 2011, among DWR, Tulare, and Westlands, approved the transfer of up to 2,000 af of Tulare's 2011 Table A water to Westlands on behalf of Westlake Farms Incorporated, with farms in both Tulare's and Westlands' service areas. During 2011, a total of 500 af was delivered under this agreement. (SWPAO #11005)

A letter agreement dated April 7, 2011, and executed April 13, 2011, between DWR and Tulare, approved the transfer of up to 8,000 af of Tulare's 2011 Table A water to Westlands. The transfer was made on behalf of two landowners, Hansen Ranches and Newton Farms, with farms in both Tulare's and Westlands' service areas. The SWRCB issued Order WR 2011-0010-DWR approving the petition on April 1, 2011, for the transfer in 2011 only. For subsequent years, a long-term agreement providing for the same landowner transfer is described above (SWPAO #10006). During 2011, a total of 2,000 af of Tulare's Table A water was delivered to Westlands. (SWPAO #11008)

A letter agreement dated August 24, 2011, and executed August 25, 2011, between DWR and Tulare, approved the conveyance of up to 30,000 af of Friant Recirculation Water in association with the San Joaquin River Restoration Program to Tulare. This nonproject water was made available by Lower Tule River Irrigation District, Tulare Irrigation District, and Fresno Irrigation District to Tulare in exchange for a comparable amount of Tulare's local river supplies. Reclamation made this nonproject water available at O'Neill Forebay for DWR to convey to Tulare under Article 55 of Tulare's long-term water supply contract. In 2011, a total of 8,557 af was delivered to Tulare under this agreement. (SWPAO #11014)

Water Conveyance and Exchange Agreements Prior to 2011

Castaic Lake Water Agency

By a letter dated June 2, 1994, DWR recognized the long-term agreement, *Wheeling of SWP Water and other Allocated Water to Castaic Lake Water Agency*, between Castaic Lake and Metropolitan for the conveyance of Castaic Lake's SWP water through Metropolitan's Foothill Feeder. Metropolitan will convey Castaic Lake's water to the Rio Vista Water Treatment Plant in Castaic's service area. During 2011, DWR delivered to Metropolitan's turnout facility a total of 18,898 af of Castaic Lake's approved SWP water supplies, of which 597 af was Article 56(c) water and 18,301 af was Table A water. (SWPAO #94001)

County of Kings

A long-term change in point of delivery agreement, executed March 10, 2006, among DWR, County of Kings (Kings), and Tulare, provides for the delivery of up to 200 af of Kings' annual Table A water to Westlands' turnouts. The water was conveyed to GWF Energy, LLC, for use within Kings County's service area. During 2011, 2 af was delivered to Westlands' turnouts. (SWPAO #02031)

A long-term change in point of delivery agreement, executed March 24, 2004, among DWR, Kings, and Westlands, provides for the delivery of up to 5,000 af of Kings' annual Table A water through Westlands turnouts for use at Lemoore Naval Air Station. The agreement is effective from January 1, 2004, through December 31, 2035. During 2011, DWR delivered a total of 2,244 af to Westlands' turnouts, which included 236 af of Article 56(c) water and 2,008 af of Table A water. (SWPAO #04005)

A long-term change in point of delivery agreement executed May 6, 2008, among DWR, Kings, and Westlands, provides for Kings' approved SWP water to be conveyed

to specified Westlands' turnouts in the California Aqueduct. This agreement defines the Westlands' turnouts to be used during the term of the agreement, January 1, 2007, through December 31, 2035. Kings requested the water for use on Westlands' agricultural lands within Kings' service area. During 2011, DWR conveyed a total of 718 af to Westlands' turnouts, of which 21 af was Turn-Back Pool A water, 61 af was Turn-Back Pool B water, 314 af was Article 21 water, and 322 af was Article 56(c) water. (SWPAO #07010)

Crestline-Lake Arrowhead Water Agency

A point of delivery agreement executed April 17, 2008, among DWR, Crestline-Lake Arrowhead Water Agency (Crestline), and San Bernardino, provides for an emergency water supply totaling 7,600 af to Lake Arrowhead Community Services District effective from January 1, 2007, through December 31, 2020, or until all water has been delivered pursuant to this agreement. During 2011, Crestline received 31 af from San Bernardino under this agreement. (SWPAO #07025)

Kern County Water Agency

A long-term point of delivery agreement executed June 8, 2000, between DWR and Kern, provided approval for the delivery to Western Hills Water District (Western Hills) of a portion of Kern's annual Table A water. In exchange, Kern will take a like amount of banked local water from the Pioneer Groundwater Bank. The SWRCB approved Western Hills' service area to be included within the authorized SWP place of use on April 21, 2000. During 2011, a total of 1,112 af of Kern's Table A water was delivered to Western Hills. (SWPAO #01001)

A letter agreement dated November 15, 2010, and executed November 19, 2010, between DWR and Kern, provides approval for the conveyance of up to 50,000 af of Westlands 2010-2011 CVP water to Semitropic, a

member unit of Kern, for storage and future return of a like amount of water to Westlands by December 31, 2021. Reclamation will make Westlands' CVP water available at O'Neill Forebay for conveyance by DWR to Semitropic under Article 55 of Kern's long-term water supply contract. During 2011, a total of 3,220 af was delivered to Kern under this agreement. (SWPAO #10022)

The Metropolitan Water District of Southern California

A letter agreement dated July 20, 2010, and executed July 23, 2010, among DWR, Metropolitan, and Santa Clara, provides for the delivery of up to 37,700 af of Metropolitan's nonproject water to Santa Clara in exchange for the delivery of an equal amount of Santa Clara's approved SWP water supply to Metropolitan. This exchange facilitated the return of Metropolitan's nonproject water under the 2003 Reclamation/Metropolitan Water Exchange Agreement. Metropolitan's nonproject water was conveyed to Santa Clara by DWR under Article 55 of Santa Clara's long-term water supply contract. During 2011, a total of 9,993 af of Metropolitan's nonproject water was delivered to Santa Clara, of which 8,168 af was delivered to Santa Clara's turnout in Reach 9 of the South Bay Aqueduct, and 1,825 af was delivered to San Luis Reservoir, thereby completing this agreement. (SWPAO #10016)

A letter agreement dated November 17, 2010, and executed on November 19, 2010, among DWR, Metropolitan, Westlands, and San Luis Water District (San Luis), provided for the conveyance of up to 150,000 af of Westlands' and San Luis' water to Metropolitan under Article 55 of Metropolitan's long-term water supply contract. The water was previously stored in San Luis Reservoir. Metropolitan will return two-thirds of the total amount delivered to its service area, up to 100,000 af of its future SWP water supplies. The exchange required a change

in place of use for the SWP and CVP water rights permits. DWR and Reclamation filed a joint petition for change to consolidate the SWP and CVP places of use south of the Delta in order to facilitate several 2010 water transfers, including this exchange. The SWRCB issued Order WR-2010-0032-DWR on November 5, 2010, and amended it on June 14, 2011, approving the joint petition for change. In 2011, a total of 73,795 af of CVP water was provided by Westlands and San Luis to Metropolitan, thereby completing this agreement. (SWPAO #10027)

Mojave Water Agency

A long-term change in point of delivery agreement executed November 13, 1997, among DWR, Mojave, and AVEK, effective through December 31, 2019, allows for delivery of up to 2,250 af of Mojave's annual Table A water to AVEK. Mojave does not have conveyance facilities to provide service to a solar energy generating station located within its service area. AVEK does have conveyance capability and has agreed to provide water service on Mojave's behalf. During 2011, DWR delivered 2,184 af of Mojave's Table A water to AVEK's Fairmont Turnout in Reach 19 of the California Aqueduct. (SWPAO #97003)

Napa County Flood Control and Water Conservation District

A change in point of delivery agreement executed December 26, 2001, among DWR, Napa County Flood Control and Water Conservation District (Napa), and Solano County Water Agency (Solano), approved the delivery of up to 628 af of Napa's annual Table A water to the City of Vallejo's Water Treatment Plant in Solano's service area. This water is further conveyed to the City of American Canyon, a member agency of Napa. The agreement is effective until December 31, 2035. A total of 39 af of Napa's 2011 Table A water was delivered to Solano's turnouts. (SWPAO #00029)

A change in point of delivery agreement executed October 11, 2010, among DWR, Napa, and Solano, approves the conveyance of up to 500 af per year of the City of Vallejo's Permit Water from Solano's service area to Napa's service area under Article 55 of Napa's long-term water supply contract. The City of Vallejo, a member agency of Solano, has water rights to nonproject water originating from Cache Slough and Lindsay Slough, tributaries of the Sacramento River. This agreement provides water to the City of Vallejo through Reach 3B of the North Bay Aqueduct, located within Napa's service area. This agreement is effective through December 31, 2035. During 2011, a total of 500 af of water was conveyed under this agreement. (SWPAO #10005)

Palmdale Water District

An agreement dated April 8, 2008, and executed July 23, 2008, among DWR, Kern, West Kern (a member unit of Kern) and Palmdale, provided for the delivery of 5,000 af of Kern's 2007 Table A water to Palmdale on behalf of West Kern, effective September 1, 2007. Palmdale will return 10,000 af of its future Table A water to Kern by December 31, 2017. This exchange was necessary in order for Palmdale to acquire an additional water supply for 2007. Kern provided 4,926 af for DWR delivery during 2007. During 2011, Palmdale returned 4,452 af to Kern under this agreement. In addition, an exchange agreement among DWR, Palmdale, and Santa Barbara, described above (SWPAO #11006), provided 2,548 af to Kern as partial return under this agreement. (SWPAO #07029)

Solano County Water Agency

A settlement agreement, which includes conveyance service by Solano, was executed May 19, 2003, among DWR, Solano, and the cities of Fairfield, Vacaville, and Benicia. The agreement provides for delivery through December 31, 2035, of up to 31,620 af per year of settlement water to Solano for

delivery to the three cities to help meet their current and future municipal and industrial water needs through the North Bay Aqueduct. During 2011, a total of 2,734 af of settlement water was delivered to Solano for conveyance to the three cities. (SWPAO #03017)

Tulare Lake Basin Water Storage District

A long-term change in point of delivery agreement executed April 5, 2009, among DWR, Tulare, and Dudley Ridge, provided for the delivery of a portion of Dudley Ridge's SWP water through Tulare's turnouts, and conversely, a portion of Tulare's SWP water through Dudley Ridge's turnouts. This agreement allows SWP water supplies to be delivered to lands within Dudley Ridge's and Tulare's service areas not otherwise serviceable using their respective conveyance facilities. This agreement is effective through December 31, 2035. During 2011, a total of 3,462 af was delivered under this agreement. (SWPAO #08062)

A letter agreement dated August 5, 2010, and executed August 10, 2010, between DWR and Tulare, approved the conveyance of up to 28,225 af of Friant Recirculation Water associated with the San Joaquin River Restoration Program to Tulare under Article 55 of its long-term water supply contract. This non-SWP water was made available at O'Neill Forebay by Reclamation. In 2011, a total of 2,539 af was delivered to Tulare under this agreement. (SWPAO #10021)

Turnout Agreements

Antelope Valley-East Kern Water Agency

On March 28, 2011, DWR executed an agreement with AVEK for modification, operation, and maintenance of the 294th Street West Turnout, located at Milepost 308.05 of the California Aqueduct. The maximum design capacity of the turnout is 18 cubic feet per second (cfs).

On June 30, 2011, DWR executed an agreement with AVEK for modification, operation, and maintenance of the 305th Street West Turnout, located at Milepost 306.7 of the California Aqueduct. The maximum design capacity of the turnout is 27 cfs.

Kern County Water Agency

On December 7, 2011, DWR executed an agreement between Kern and Buena Vista Water Storage District (Buena Vista) for construction, operation, and maintenance of Buena Vista's Turnout No. 8, located at Milepost 233.8 of the California Aqueduct. The turnout will connect and deliver water to Buena Vista's West Side Canal, and has a design capacity of 300 cfs.

Activities Related to the Monterey Amendments

Storage of Water Outside SWP Contractor Service Areas

Pursuant to Article 56(c) of the Monterey Amendments, six SWP water contractors have separate agreements with DWR to convey approved water supplies outside their service areas for storage in existing and operational groundwater storage programs and for future recovery of water to use within their service areas. These types of agreements, effective or pending execution during 2010, are listed in Table 9-1. The change in point of delivery agreements include provisions for conveyance to and from storage, and recovery methods by exchange and/or pump-in to the California Aqueduct. During 2011, a total of 462,521 af was conveyed to storage, including losses, and 39,549 af was recovered from storage.

Turn-Back Water Pool Program

Pursuant to Article 56(d) of the Monterey Amendments, the Turn-Back Water Pool Program was initiated through "Notice to State Water Project Contractors, No. 11-01," dated January 21, 2011. All SWP water

contractors who have signed the Monterey Amendments were permitted to participate in the program. The program allowed SWP water contractors to offer a portion of their approved 2010 Table A water for sale in a turn-back pool for use by interested SWP water contractors. Based on Table A supply and demand, the turn-back water pool water was allocated among the purchasing contractors.

Initial offers for sales of Pool A and Pool B of the Turn-Back Water Pool Program occurred in February and March 2011, respectively, with 14,296 af purchased under Pool A, and 16,765 af purchased under Pool B. Pool A Turn-Back water sold for \$20.96 per af (50 percent of the 2011 Delta Water Rate). Pool B Turn-Back water sold for \$10.48 per af (25 percent of the 2011 Delta Water Rate). The 2011 Turn-Back Water Pool Program closed on June 1, 2011. Notices to State Water Project Contractors describing the Turn-Back Water Pool Program are available on DWR's website.

Table 9-2 lists SWP water contractors who participated in Pool A and Pool B of the 2011 Turn-Back Water Pool Program.

Article 21 Water Program

Pursuant to the Monterey Amendments, Article 21 water replaces surplus, wet weather, and Article 12(d) water. The Article 21 Water Program allows an SWP water contractor to take delivery of water over the approved and scheduled Table A amounts for the current year. Article 21 water is only available for delivery on a short-term basis as determined by DWR when water is still available after operational requirements for SWP water deliveries, water quality, and Delta requirements are met.

Guidelines for the Article 21 Water Program for 2011 are described in the December 27, 2010, "Notice to State Water Project Contractors, No. 10-13," available on

Table 9-1 Storage of Water Outside SWP Contractor Service Areas in 2011 (acre-feet)

Contractor	Contract Status	Storage Provider	Stored (include losses, if any)	From Storage	Return By
Alameda-Zone 7					
SWPAO #99018	Continuing	Semitropic	0	0	2035
SWPAO #00037	Continuing	Semitropic	0	0	2035
SWPAO #01035	Continuing	Semitropic	0	0	2035
SWPAO #02010	Continuing	Semitropic	0	0	2035
SWPAO #03008	Continuing	Semitropic	0	0	2035
SWPAO #04017	Continuing	Semitropic	5,171	0	2035
SWPAO #06010	Continuing	Cawelo	9,000	0	2035
Alameda County					
SWPAO #99017	Continuing	Semitropic	0	0	2035
SWPAO #00030	Continuing	Semitropic	0	0	2035
SWPAO #07005	Continuing	Semitropic	0	0	2035
SWPAO #10009	Executed 03/16/11	Semitropic	65	0	2035
Castaic Lake					
SWPAO #02015	Continuing	Semitropic	0	0	2022
SWPAO #03060	Continuing	Semitropic	0	0	2024
SWPAO #05016	Continuing	Rosedale-Rio	0	0	2035
Dudley Ridge					
<i>SWP Water</i>					
SWPAO #08050	Continuing	Kern Water Bank	31,260	0	2035
SWPAO #09002	Continuing	Semitropic	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #09040	Continuing	Kern Water Bank	0	65	2013
Metropolitan					
SWPAO #95010	Continuing	Semitropic	134,111	0	2035
SWPAO #01013	Continuing	Arvin-Edison	92,201	39,484	2035
SWPAO #03019	Continuing	Kern-Delta	54,462	0	2035
SWPAO #03057	Continuing	Mojave	0	0	2015
SWPAO #11011	Executed 9/8/2011	Mojave	45,048	0	2035
San Bernardino					
SWPAO #11015	Pending	Kern-Delta	7,179	0	2035
Santa Clara					
<i>SWP Water</i>					
SWPAO #99016	Continuing	Semitropic	0	0	2035
SWPAO #06031	Continuing	Semitropic	0	0	2035
SWPAO #06032	Continuing	Semitropic	0	0	2035
SWPAO #06011	Continuing	Semitropic	0	0	2035
SWPAO #10012	Continuing	Semitropic	27,059	0	2035
<i>Non-SWP Water</i>					
SWPAO #06012	Continuing	Semitropic	0	0	2035
SWPAO #10029	Executed 6/13/2011	Semitropic	0	0	2035
SWPAO #11012	Executed 11/22/2011	Semitropic	37,770	0	2035
Total^a			462,521	39,549	

^a Total acre-feet indicates all water recovered from various water banks. Some of the recovered water may be temporarily stored in SWP facilities. Amounts include losses, if any.

Table 9-2 2011 Turn-Back Water Pool Program (acre-feet)

Contractor	Sold	Purchased
Pool A		
Butte ^a	14,296	
Alameda-Zone 7		348
Coachella ^b		596
Kings		40
Desert ^c		240
Dudley Ridge		217
Kern (Agricultural)		4,235
Metropolitan		8,237
Tulare		383
Total	14,296	14,296
Pool B		
Butte	4,765	
Ventura	12,000	
Alameda-Zone 7		971
Alameda County		506
Coachella		1,666
Kings		112
Dudley Ridge		606
Kern (Agricultural)		11,833
Tulare		1,071
Total	16,765	16,765

^a County of Butte

^b Coachella Valley Water District

^c Desert Water Agency

Table 9-3 Article 21 Water Deliveries (acre-feet)

Contractor	Amount
Alameda County	1,959
AVEK	7,629
Castaic Lake	400
Kings	552
Dudley Ridge	11,666
Kern (Agricultural)	194,119
Santa Clara	970
Solano	15,000
Metropolitan	181,610
Tulare	6,909
Total	420,814

DWR’s website. During 2011, due to water conditions and storage amounts in San Luis Reservoir, Article 21 water became available to all SWP water contractors who had signed the Monterey Amendment. A total of 420,814 af of Article 21 water was delivered to 10 contractors listed in Table 9-3.

Flexible Storage Program

Pursuant to Article 54 of the Monterey Amendments, the Flexible Storage Program provides SWP water contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris the option to withdraw water in excess of approved deliveries. The program objective is to provide additional flexibility to benefit local water management activities. Participating SWP water contractors are given 5 years to replace stored water withdrawn with approved SWP or non-SWP water.

Flexible storage allows for withdrawal of up to 160,000 af at Castaic Lake and 65,000 af at Lake Perris. SWP water contractors participating in the Castaic Lake Flexible Storage Program include Metropolitan, Ventura County Watershed Protection District (Ventura), and Castaic Lake. These contractors are allowed to withdraw up to a maximum of 153,940 af, 1,377 af, and 4,683 af, respectively. Metropolitan is the only SWP water contractor allowed to withdraw water from Lake Perris, up to a maximum of 65,000 af.

Metropolitan was the only participant in the Flexible Storage Program in 2011 at Castaic Lake. At the beginning of 2011, Metropolitan owed 13 af to Castaic Lake storage and had a balance of 4,710 af in Lake Perris. During 2011, Metropolitan withdrew 27,294 af from storage in Castaic Lake, and provided 27,307 af to storage in Castaic Lake, ending 2011 with a balance of 0 af. Metropolitan withdrew 9,237 af from storage in Lake Perris, and provided 9,237 af to storage in Lake Perris, ending 2011 with a balance of 4,710 af.

Extended Carryover Program

Pursuant to Article 56 of the Monterey Amendments, SWP water contractors can elect to store SWP water outside of their service areas and carry it over to the following year for use within their service areas. Qualified contractors can request the carryover of Table A water for delivery in the following year to the extent that such deliveries do not adversely affect current or future project operations. Factors that influence how much extended carryover water can be delivered include operational constraints of project facilities, filling of SWP conservation storage facilities, flood control releases, and water quality restrictions. If storage requests exceed the available storage capacity, the amount available is allocated among the SWP water contractors requesting storage in proportion to their annual Table A water for that year. Twenty SWP water contractors took delivery of Article 56(c) in the amount of 267,683 af of approved 2010 Table A water carried over into 2011, as extended carryover.

Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) was announced in 2005 to settle long-standing litigation over instream flows in the Yuba River in relation to fisheries. The purpose of the Yuba Accord is to resolve instream flow issues associated with the operation of the Yuba River Development Project in a way that protects and enhances lower Yuba River fisheries and local water supply reliability. The Yuba River Development Project provides revenues for local flood control and water supply projects, water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for the protection and restoration of Sacramento-San Joaquin Delta fisheries, and improvements in statewide water supply management, including dry year water supplies for participating SWP and CVP water contractors.

The Yuba Accord is based on three sets of agreements: a water purchase agreement with DWR, including water to help offset Delta export reductions and dry year water for participating SWP and CVP water contractors; conjunctive use agreements with Yuba County Water Agency (Yuba) member units; and a fisheries agreement resolving minimum flows. The Yuba Accord provides for higher releases into the Yuba River to benefit Chinook Salmon and steelhead, transfer water to help offset Delta export reductions annually, and dry year transfer water for SWP and CVP water contractors from both surface and groundwater substitution sources.

The required agreements were executed in late 2007 and early 2008, and the SWRCB approved the Yuba Accord on March 25, 2008, setting the flow schedules for the river and authorizing accord-based water transfers through 2025. During that same period, DWR completed the execution of 22 agreements for dry year supplies for participating SWP and CVP water contractors under the accord. A total of 166,086 af was transferred to DWR and participating SWP and CVP water contractors under the accord in 2008, 180,000 af was transferred in 2009, and 141,856 af was transferred in 2010.

In 2011, excess conditions in the Delta prevented accounting of Yuba releases as transfer water for the entire summer transfer season. Yuba must repay Component 1 water in a future year that is not a dry or critical year, will not reduce Component 2 or 3 deliveries, and is agreeable in schedule to the parties. The effects of the biological opinions on allocations and transfer timing make that repayment more difficult than was envisioned when the Water Purchase Agreement was negotiated.

In April 2009, two amendments to the Yuba Accord's water purchase agreement were executed. Amendment Number 1 resolved a technical issue related to refill accounting, and Amendment Number 2 addressed pricing issues for groundwater substitution water.

Amendment Number 3 was executed on April 22, 2010, and addressed market pricing issues for groundwater substitution water. In 2011, Amendment Number 4 to the Yuba Accord's water purchase agreement was negotiated with an expected execution date in January 2012. Amendment Number 4 provides for annual negotiations of groundwater substitution water pricing, prioritizing SWP water contractors' Delta export transfer supplies, and possibly suspending certain accounting rules to permit all groundwater substitution water to be classified as Component 4 water.

Under Amendment Number 4, all accrued groundwater substitution water is payable although it may not be exported. The single exception is that DWR and Yuba Accord water contractors will not be required to pay for the portion (if any) of groundwater substitution component water that is released in accordance with the provisions of Section 5.1.8, Supplemental Flows for Groundwater Substitution Programs, of the Yuba Accord Fisheries Agreement. When New Bullards Bar Reservoir is releasing extra water due to a wet winter, Yuba may not reduce releases or accrue groundwater substitution water during the following irrigation season.

Agreements with Non-SWP Agencies

In addition to negotiating agreements with long-term SWP water contractors to provide for specified water deliveries, DWR also enters into agreements with other agencies to provide water conveyance service.

Reclamation—Joint Point of Diversion

DWR conveys CVP water, made available by Reclamation at the Delta, from Banks Pumping Plant to O'Neill Forebay under the Joint Point of Diversion authorized in SWP and CVP water rights. The Joint Point of

Diversion allows Reclamation to make up for curtailed water exports from C.W. "Bill" Jones (Jones) Pumping Plant associated with improving conditions for fish in the Delta, or, may allow replacing water exports foregone during maintenance and repair of the Jones Pumping Plant and/or CVP conveyance facilities between the Delta and O'Neill Forebay. In 2011, DWR did not deliver CVP water to Reclamation under this agreement, effective March 1, 2010, through February 29, 2012. (SWPAO #10312)

Reclamation and Byron-Bethany Irrigation District—Musco Family Olive Company

A pending agreement among DWR, Byron-Bethany Irrigation District (Byron-Bethany), and Reclamation, provides for the conveyance of up to 800 af of Byron-Bethany's CVP water to repayment Reach 2A of the California Aqueduct for use by Musco Family Olive Company. DWR delivered a total of 467 af in 2011 under this pending agreement. (SWPAO #04300)

Reclamation and Cross Valley Canal Contractors

Through eight, 3-party contracts with Reclamation and Cross Valley Canal (CVC) water contractors, DWR conveys CVP water for CVC water contractors via the California Aqueduct through the CVC turnout at Reach 12E. The following eight CVP water contractors are defined as CVC water contractors: County of Fresno (Fresno), County of Tulare (Tulare), Hills Valley Irrigation District (Hills Valley), Kern-Tulare, Lower Tule River Irrigation District (Lower Tule), Pixley Irrigation District (Pixley), Rag Gulch Water District (Rag Gulch), and the Tri-Valley Water District (Tri-Valley). Effective January 1, 2009, Rag Gulch consolidated under Kern-Tulare. DWR approved assignment of Rag Gulch's Interim Renewal Contract to Kern-Tulare on April 7, 2009.

Fresno, Tulare, Lower Tule, and Pixley executed contracts in 1975. Hills Valley, Kern-Tulare, Rag Gulch, and Tri-Valley executed contracts in 1976. All eight original contracts terminated on December 31, 1995. In 1995, amendments were executed that extended the termination dates to February 29, 1996, for all contracts. Interim Renewal (IR) contracts have been executed during the ensuing years to extend the termination dates as follows:

- March 1, 1996, through February 28, 1998 (IR 1);
- March 1, 1998, through February 29, 2000 (IR 2);
- March 1, 2000, through November 30, 2000 (IR 3);
- December 1, 2000, through February 28, 2001 (IR 4);
- March 1, 2001, through February 28, 2002 (IR 5);
- March 1, 2002, through February 28, 2003 (IR 6);
- March 1, 2003, through February 29, 2004 (IR 7);
- March 1, 2004, through February 28, 2005 (IR 8);
- March 1, 2005, through February 28, 2006 (IR 9);
- March 1, 2006, through February 28, 2007 (IR 10);
- March 1, 2007, through February 29, 2008 (IR 11);
- March 1, 2008, through February 28, 2010 (IR 12); and
- March 1, 2010, through February 29, 2012 (IR 13).

In accordance with the terms of IR 13, DWR delivered 1,000 af to Kern-Tulare during 2011.

Reclamation and Kern National Wildlife Refuge—U.S. Fish and Wildlife Service

A letter agreement sent by DWR on September 28, 2004, and accepted by Reclamation on January 24, 2005, provided for DWR to deliver up to 30,500 af of CVP water to the Kern National Wildlife Refuge during the term May 1, 2002, through May 31, 2009. By Amendment Number 2, sent by DWR on June 17, 2008, and accepted by Reclamation on August 1, 2008, the term was extended to May 31, 2012. Under the agreement, DWR would convey CVP water from the end of Reach 7 to Buena Vista's turnouts in Reaches 10A and 12E of the California Aqueduct. DWR conveyed 23,556 af of CVP water to Reach 10A and 2,305 af of CVP water to Reach 12E for Kern National Wildlife Refuge during 2011. (SWPAO #03317)

Reclamation and San Joaquin Valley National Cemetery—U.S. Department of Veterans Affairs

A letter agreement sent by DWR on November 16, 2009, accepted by the U.S. Department of Veterans Affairs on November 19, 2009, and accepted by Reclamation on March 19, 2010, provided for the conveyance of up to 850 af of CVP water to Reach 2B of the California Aqueduct for the U.S. Department of Veterans Affairs' San Joaquin Valley National Cemetery. DWR delivered a total of 259 af to the national cemetery through Reach 2B of the California Aqueduct in 2011. (SWPAO #03312)

Water Deliveries

Table A Deliveries

Each year, by October 1, the SWP water contractors submit initial requests for Table A deliveries allocated to them for use in the subsequent calendar year. Initial Table A allocation amounts for the coming year are made by DWR in December.

They are based on operations studies that assume 90 percent exceedence of historical water supply (where exceedence refers to the possibility that water supply in the coming year will be exceeded by the historical water supply), current reservoir storage, and total requests by the SWP water contractors. Forecasts for the year are updated as hydrologic conditions change. Table A amounts are increased or decreased depending on both actual and projected hydrologic conditions, though decreases are rare as the 90 percent exceedence criterion is fairly conservative.

On October 1, 2010, SWP water contractors submitted initial requests for 2011 totaling 4.17 million acre-feet (maf).

DWR approved 1.04 maf on November 22, 2010, resulting in initial Table A amounts of 25 percent of most SWP water contractor requests. DWR increased the 2011 Table A amounts to 3.34 maf, or 80 percent, on April 20, 2011. Table 9-4 lists the changes in Table A amounts that were approved by DWR based on updated hydrologic conditions.

Table 9-4 2011 Allocated Table A Amounts

Notice to SWP Contractors No.	Allocation Amount (maf)	Percentage of Requested Water
10-12	1.04	25
10-14	2.09	50
11-03	2.50	60
11-05	2.92	70
11-06	3.34	80

2011 SWP Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering Table A water to SWP water contractors, the SWP:

- provides water for wildlife and recreational uses;

- conveys water to other public and local agencies through special contracts and agreements; and
- stores, releases, and delivers local runoff water from SWP facilities to agencies that hold local water rights.

In 2011, 4,630,798 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 24 other agencies.

The portion delivered to the SWP water contractors was 3,348,931 af, categorized as follows:

- 2,512,484 af of Table A water;
- 12,331 af of transferred Table A water;
- 23,383 af of exchanged Table A water;
- 31,061 af of Pool A and Pool B water;
- 420,814 af of Article 21 water;
- 268,313 af of 2010 carryover water (Article 12(e) and Article 56(c));
- 39,549 af recovered from water banks;
- 36,531 af of flexible storage withdrawal;
- 2,872 af of settlement water; and
- 1,593 af of SWP water for recreation and fish and wildlife.

The remaining portion was delivered to 24 non-SWP agencies and totaled 1,281,867 af, which was categorized accordingly:

- 1,064,507 af of local water;
- 1,141 af of permit water; and
- 216,219 af delivered to satisfy agreements between the SWP and CVP.

Figure 9-1 shows amounts of water delivered to various locations during 2011.

Specific information about water deliveries made to SWP water contractors and other agencies during 2011, and historical



Figure 9-1 Water Delivered in 2011 and Delivery Locations of Long-term Water Supply Contractors and Feather River Area Districts with Water Rights Agreements with DWR

deliveries from 1962 through 2011, are presented in the following three sections, each with a corresponding table located at the end of the chapter:

- Water Delivered to Long-term Water Supply Contractors in 2011, by Service Area (Table 9-5);
- Total Amounts of Water Delivered in 2011, by Month (Table 9-6); and
- Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2011 (Table 9-7).

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

2011 Water Deliveries to Long-term SWP Water Contractors

Table 9-5 shows amounts delivered in 2011. The following information is arranged by column number.

Table A Water Delivered

Columns 1 through 5 show a detailed breakdown of Table A water delivered for SWP water contractors in 2011.

Turn-Back Pool Water

Column 4 shows 31,061 af of Turn-Back Pool Water delivered to SWP water contractors in 2011.

2010 Carryover Table A Water Delivered in 2011

Column 6 shows a total of 268,313 af was carried over from 2010 for delivery in 2011.

The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose water by December 31 of each year. The SWP water contractors' long-term contracts and amendments state the criteria for carrying over Table A water from one year to the next under Articles 12(e), 14(b), and 56(c).

Total Table A Water Delivered

Column 7 shows all Table A water delivered in 2011—a total of 2,847,572 af.

Article 21

Column 8 shows 420,814 af of 2011 Article 21 water was delivered to SWP water contractors.

Other SWP Water

Column 9 shows 39,403 af of other SWP water. Other SWP water includes flexible withdrawal water from Castaic Lake and Lake Perris, and settlement water.

Total SWP Water Delivered

Column 10 shows 3,307,789 af of total SWP water was delivered in 2011. This includes total Table A water, 2010 Table A carryover water, Article 21 water, and other SWP water consisting of settlement and flexible withdrawal water.

Non-SWP Water Deliveries

Columns 11 and 12 include deliveries of non-SWP water to long-term water contractors. Column 11 shows 39,549 af of water bank recovery water. Column 12 shows 205,438 af of other non-SWP water. Other non-SWP water is local and permit water that an SWP water contractor has a water right to, water purchased from, exchanged with, or transferred from non-SWP agencies. In 2011, non-SWP water deliveries totaled 1,281,867 af.

Total Deliveries

Column 13 shows total amounts of water delivered to SWP water contractors. In 2011, the SWP delivered 3,552,776 af of water to 29 long-term contractors.

Water Delivered in 2011 by Month

During 2011, the SWP provided water service to 53 agencies, including 29 long-term SWP water contractors. Those agencies and the amounts of water delivered to them by month are listed in Table 9-6 and are summarized below as SWP water and non-SWP water.

SWP Water

SWP water, as defined in the long-term water supply contracts, includes Article 21 water, carryover Table A water, current year Table A amounts, transfer and exchange of Table A water, and Turn-Back Pools A and B. Detailed information concerning those conveyances is found under the "Miscellaneous Agreements with Long-term SWP Water Contractors" section in this chapter.

Non-SWP Water

In 2011, DWR used SWP facilities to convey non-SWP water for various agencies according to the terms of water rights and water transfer and exchange agreements. Detailed information concerning those conveyances is in this chapter.

Water Rights Water. Water in this category is transported through SWP facilities to long-term SWP water contractors and other agencies according to terms of various settlement agreements. Some water passes through SWP transportation facilities; some is stored in SWP reservoirs for release later. In 2011, 1,065,648 af of water in this category was delivered to the Feather River, Delta, North Bay, South Bay, and Southern California areas, and is summarized below.

Feather River Area. Ten non-SWP agencies received 1,028,542 af; as follows:

- Last Chance Creek Water District, 7,499 af;
- Thermalito Irrigation District, 1,804 af;
- South Feather Water and Power Agency (formerly Oroville-Wyandotte Irrigation District), 3,816 af;
- Western Canal Water District, 304,564 af;
- Joint Water Districts Board, 687,449 af;
- Oswald Water District, 881 af;
- Tudor Mutual Water Company, 589 af;
- Garden Highway Mutual Water Company, 14,955 af;
- Plumas Mutual Water Company, 6,729 af; and
- Valberde and Ramelli, 256 af.

Delta. In the Delta, 20,926 af of Byron-Bethany water was delivered pursuant to the May 28, 2003, *Agreement Between the Department of Water Resources of the State of California and the Byron-Bethany Irrigation District Regarding the Diversion of Water from the Delta*.

North Bay Area. In the North Bay area, 1,141 af of Vallejo permit water and 2,734 af of water pursuant to the May 19, 2003, *Settlement Agreement among DWR, Solano County Water Agency, and the Cities of Fairfield, Vacaville, and Benicia* were delivered.

South Bay Area. In the South Bay area, a total of 9,602 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct (SBA) SWP water contractors hold water rights to runoff from the Lake del Valle watershed.

Southern California Area. In the Southern California area, 299 af of local runoff from the Houston Creek watershed was stored and delivered to Crestline under water rights held by DWR on Houston Creek. The authorized place of use is limited to Crestline.

Annual Table A Water and Water Delivered Since 1962

Information about 2011 annual Table A water and water conveyed for the previous 49 years is contained in Table 9-7. The following discussion of conveyed Table A water is arranged according to column numbers.

Annual Table A Water

Columns 1 through 7 of Table 9-7 show the amount of SWP water contractors' annual Table A water by area for years 1962 through 2011 as specified in the Table A schedules of the long-term water supply contracts.

In some instances, Table A schedules—projections of each contractor's need for water to 2035—have been amended to meet the needs of individual contractors. The amounts of annual Table A water each SWP water contractor may request for years 1962 through 2035 can be found in Table B-4 in Appendix B in the back of this bulletin.

Water Delivered

Columns 8 through 16 show water delivered or conveyed, including initial fill water and operational losses and storage changes.

Table A Water. Column 8 shows amounts of Table A water delivered each year from 1962 through 2011. In 2011, a total of 2,847,572 af of Table A water was delivered.

Article 21 and Unscheduled Water.

Column 9 shows amounts of Article 21 water, as defined under SWP deliveries, and unscheduled water delivered from 1962 through 2011. Article 21 and unscheduled water is water in excess of that required to meet all demands for the year's Table A water and water to be stored in SWP reservoirs. In 2011, a total of 420,814 af of Article 21 water was delivered. No unscheduled water was delivered.

Other Water. Column 10 includes amounts of water classified as other water delivered in 2011, including non-SWP water conveyed through SWP facilities and regulated delivery of local supply. In 2011, a total of 332,277 af of other water was delivered.

Feather River Diversions. Column 11 includes amounts of water from the Feather River delivered according to agreements for water rights water. Column 11 also includes Delta diversions. In 2011, a total of 1,028,542 af in this category was delivered to agencies in the Feather River area.

Recreation Water. Column 12 shows water conveyed for recreational use or to provide water to improve water quality for fish and wildlife. In 2011, a total of 1,593 af of SWP water was conveyed for this purpose.

Initial Fill Water. The quantities listed in Column 14 represent the amounts used to initially fill the aqueducts and reservoirs south of the Delta to maximum operating capacities. Initial filling began in 1962, with the filling of the SBA, and was completed in 1979, when Lake Perris reached its maximum operating capacity of 127,000 af. In 1996 and 1997, the Coastal Aqueduct was initially filled.

Operational Losses. Column 15 includes the total amounts of water lost through evaporation and seepage, net storage changes in reservoirs south of the Delta, and amounts of inflow from local drainage areas, including inflows into San Luis Canal and from the Kern River Intertie. Negative values are indicated for years when withdrawals and evaporation from reservoirs south of the Delta exceed the amounts of water added to the reservoirs.

Table 9-5 Water Delivered to Long-term Contractors through 2011, by Service Area (acre-feet)^a

SWP Contractor	Table A Water Deliveries					SWP Water					Non-SWP Water			Total Water Delivered (13)
	2011 Table A Not Transferred, or Exchanged, or Stored (1)	2011 Table A Transferred or Exchanged (2)	2011 Table A Stored (3)	2011 Turn-Back Pools (4)	Total 2011 Table A (5)	2010 Carryover (6)	Total Table A (7)	2011 Article 21 (8)	Other SWP Water (9)	Total SWP Water (10)	Water Bank Recovery (11)	Other Non-SWP Water (12)		
Feather River														
Butte	1,092				1,092		1,092			1,092				1,092
Plumas	98				98		98			98		256		354
Yuba City	2,297				2,297		2,297			2,297				2,297
North Bay														
Napa	9,426				9,426	1,388	10,814			10,814		500		11,314
Solano	9,620				9,620		9,620	15,000	2,734	27,354		641		27,995
South Bay														
Alameda-Zone 7	39,066			1,319	40,385	11,675	52,060			52,060		10,268		62,328
Alameda County	24,813			506	25,319	9,332	34,651	1,959		36,610	65	4,860		41,470
Santa Clara	64,538				64,538	12,150	76,688	970		77,658		49,857		127,515
San Joaquin Valley														
Kings	5,294			152	5,446	558	6,004	552		6,556				6,556
Dudley Ridge	36,190			823	43,370	5,524	48,894	11,666		60,560				60,625
Empire	1,226				1,626	151	1,777		138	1,915				1,915
Kern	747,244			16,068	780,207	119,773	899,980	194,119		1,094,099		21,238		1,115,337
Oak Flat	2,644				2,644	71	2,715			2,715				2,715
Tulare	30,556			1,454	40,510	4,626	45,136	6,909		52,045		11,096		63,141
Central Coastal														
San Luis Obispo	3,340				3,340	479	3,819			3,819				3,819
Santa Barbara	14,280				14,280	9,318	23,598			23,598				23,598
Southern California														
AVEK	77,549				80,529	5,888	86,417	7,629		94,046				94,046
Castaic Lake	29,067				29,067	9,332	38,399	400		38,799				38,799
Coachella	88,017				90,279		90,279			90,279				90,279
Crestline	423				423	51	474			474		299		773
Desert	36,139				36,379		36,379			36,379				36,379
Littlerock					0		0			0				0
Metropolitan	1,208,611			8,237	1,216,848	63,881	1,280,729	181,610	36,531	1,498,870	39,484	106,423		1,644,777
Mojave	4,831				4,831	268	5,099			5,099				5,099
Palmdale	9,314				9,314	5,019	14,333			14,333				14,333
San Bernardino	30,885				30,916	7,210	38,126			38,126				38,126
San Gabriel	23,040				23,591		23,591			23,591				23,591
San Geronimo	8,884				8,884	1,619	10,503			10,503				10,503
Ventura	4,000				4,000		4,000			4,000				4,000
Totals	2,512,484	35,714	--	31,061	2,579,259	268,313	2,847,572	420,814	39,403	3,307,789	39,549	205,438	3,552,776	

^a Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent publication of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2011 Total Deliveries
FEATHER RIVER AREA													
<i>SWP Agencies</i>													
City of Yuba City													
Table A	0	0	0	0	0	0	1,074	1,155	68	0	0	0	2,297
Agency Total	0	0	0	0	0	0	1,074	1,155	68	0	0	0	2,297
County of Butte													
Table A	30	16	2	86	199	67	88	181	303	114	2	4	1,092
Recreation/Fish and Wildlife (SWP)													
Recreation/Fish and Wildlife	1	0	0	1	0	0	1	0	1	0	0	1	5
Agency Total	31	16	2	87	199	67	89	181	304	114	2	5	1,097
Plumas County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	61	0	37	0	0	98
Agency Total	0	0	0	0	0	0	0	61	0	37	0	0	98
<i>Non-SWP Agencies</i>													
Garden Highway Mutual Water Company													
Regulated Delivery of Local Supply	0	0	0	815	2,555	3,295	2,497	3,696	922	1,175	0	0	14,955
Joint Water Districts Board													
Regulated Delivery of Local Supply	38,160	0	0	5,970	106,740	97,639	118,179	114,221	52,470	0	82,260	71,810	687,449
Last Chance Creek Water District													
Regulated Delivery of Local Supply	0	0	0	0	1,222	1,755	0	3,969	0	369	0	184	7,499
Oswald Water District													
Regulated Delivery of Local Supply	0	0	0	0	73	166	253	175	214	0	0	0	881
Plumas Mutual Water Company													
Regulated Delivery of Local Supply	0	0	0	0	1,111	1,431	1,699	1,104	1,384	0	0	0	6,729
South Feather Water and Power Agency													
Regulated Delivery of Local Supply	0	0	0	30	478	556	760	786	703	236	152	115	3,816
Thermalito Irrigation District													
Regulated Delivery of Local Supply	61	80	88	91	143	167	275	301	262	139	98	99	1,804
Tudor Mutual Water Company													
Regulated Delivery of Local Supply	0	4	0	23	138	0	254	93	77	0	0	0	589
Western Canal Water District													
Regulated Delivery of Local Supply	5,684	0	0	2,770	44,640	41,189	61,707	54,019	12,971	17,340	40,249	23,995	304,564
Valverde and Ramelli													
Regulated Delivery of Local Supply	0	0	0	0	12	74	12	131	0	27	0	0	256
SWP	31	16	2	87	199	67	1,163	1,397	372	151	2	5	3,492
Non-SWP	43,905	84	88	9,699	157,112	146,272	185,636	178,495	69,003	19,286	122,759	96,203	1,028,542
Feather River Area Total	43,936	100	90	9,786	157,311	146,339	186,799	179,892	69,375	19,437	122,761	96,208	1,032,034

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
NORTH BAY AREA													
<i>SWP Agencies</i>													
Napa County Flood Control and Water Conservation District													
Table A	0	0	0	232	1,212	1,116	1,331	1,393	1,027	897	1,091	1,088	9,387
Table A Point of Delivery through Solano*	0	0	0	1	3	4	3	20	7	1	0	0	39
Article 56(c) Carryover	318	654	217	0	199	0	0	0	0	0	0	0	1,388
Vallejo Permit to Napa	0	0	0	0	0	0	200	200	100	0	0	0	500
Agency Total (*excluded from total)	318	654	217	232	1,411	1,116	1,531	1,593	1,127	897	1,091	1,088	11,275
Solano County Water Agency													
Table A	0	20	0	135	490	1,746	1,812	1,614	1,593	571	785	854	9,620
Table A Point of Delivery from Napa	0	0	0	1	3	4	3	20	7	1	0	0	39
Article 21	0	28	0	168	1,450	1,691	2,475	2,670	3,344	1,808	1,366	0	15,000
Settlement	0	0	0	0	0	0	0	0	0	1,123	930	681	2,734
Vallejo Permit	0	36	35	19	36	17	21	34	34	0	0	409	641
Vallejo Permit to Napa*	0	0	0	0	0	0	200	200	100	0	0	0	500
Agency Total (*excluded from total)	0	84	35	323	1,979	3,458	4,311	4,338	4,978	3,503	3,081	1,944	28,034
SWP	318	702	217	536	3,354	4,557	5,621	5,697	5,971	4,400	4,172	2,623	38,168
Non-SWP	0	36	35	19	36	17	221	234	134	0	0	409	1,141
North Bay Area Total	318	738	252	555	3,390	4,574	5,842	5,931	6,105	4,400	4,172	3,032	39,309
SOUTH BAY AREA													
<i>SWP Agencies</i>													
Alameda County Flood Control and Water Conservation District, Zone 7													
Table A	30	32	48	306	1,668	2,255	3,637	6,169	6,056	4,222	2,496	2,147	29,066
Table A Transfer to Kern-Delta Water Bank*	0	0	0	0	0	2,021	4,994	2,985	0	0	0	0	10,000
Pool A	0	0	0	0	0	0	0	348	0	0	0	0	348
Pool B	0	0	0	0	0	0	971	0	0	0	0	0	971
Article 56(c) Carryover	595	1,668	67	1,890	1,710	0	0	0	0	0	0	0	5,930
Article 56(c) Carryover Transfer to Kern*	0	2,331	3,414	0	0	0	0	0	0	0	0	0	5,745
Local	286	188	1,732	784	1,406	2,948	1,311	138	251	198	172	188	9,602
Transfer from Byron-Bethany	0	0	0	0	0	0	666	0	0	0	0	0	666
Agency Total (*excluded from total)	911	1,888	1,847	2,980	4,784	5,203	6,585	6,655	6,307	4,420	2,668	2,335	46,583
Alameda County Water District													
Table A	0	0	0	172	1,602	992	804	1,921	2,316	1,191	1,612	1,203	11,813
Table A Transfer to Kern-Delta Water Bank*	0	0	0	0	5,437	2,563	0	0	0	0	0	5,000	13,000

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Pool A	0	0	0	0	0	0	506	0	0	0	0	0	0	506
Article 56(c) Carryover	250	978	0	784	0	0	0	0	0	879	0	0	0	2,891
Article 56(c) Carryover Transfer to Kern*	0	5,380	1,061	0	0	0	0	0	0	0	0	0	0	6,441
Article 21 Transfer to Kern*	0	0	446	1,513	0	0	0	0	0	0	0	0	0	1,959
Local	0	0	1,348	552	500	1,000	1,000	460	0	0	0	0	0	4,860
Agency Total (*excluded from total)	250	978	1,348	1,508	2,102	1,992	2,310	2,381	2,316	2,070	1,612	1,203	20,070	
Santa Clara Valley Water District														
Table A	0	0	0	0	3,852	5,627	7,088	7,364	7,212	1,733	2,350	2,283	37,509	
Table A to Kern*	0	0	1,768	2,976	14,017	3,960	4,308	0	0	0	0	0	27,029	
Article 14(b) Carryover	0	0	4,363	3,684	1,871	0	0	0	0	0	0	0	9,918	
Article 14(b) Transfer to Kern*	0	2,232	0	0	0	0	0	0	0	0	0	0	2,232	
Article 56(c) Transfer to Metropolitan*	0	0	8,341	0	0	0	0	0	0	0	0	0	8,341	
Article 21	0	0	0	166	0	0	0	0	0	0	0	0	166	
Article 21 Transfer to Kern*	0	0	250	554	0	0	0	0	0	0	0	0	804	
General Conveyance from San Benito Water District	0	5,000	0	0	0	0	0	0	0	0	0	0	5,000	
General Conveyance from Metropolitan	1,835	1,556	248	0	0	0	0	0	0	4,529	0	0	8,168	
General Conveyance to Kern-Delta Water Bank*	0	0	0	0	0	0	0	5,636	28,079	0	0	2,696	36,411	
Local	0	0	278	0	0	0	0	0	0	0	0	0	278	
Agency Total (*excluded from total)	1,835	6,556	4,889	3,850	5,723	5,627	7,088	7,364	7,212	6,262	2,350	2,283	61,039	
Non-SWP Agencies														
Byron-Bethany Irrigation District														
Regulated Delivery of Local Supply	105	292	50	1,969	3,417	3,767	4,459	3,315	2,819	529	204	0	20,926	
Recreation/Fish And Wildlife (SWP)														
Lake del Valle	1	1	1	12	15	15	19	23	19	11	3	2	122	
SWP	876	2,679	4,479	7,014	10,718	8,889	12,054	15,477	15,603	8,036	6,461	5,635	97,921	
Non-SWP	2,226	7,036	3,656	3,305	5,323	7,715	8,407	4,261	3,070	5,256	376	188	50,819	
South Bay Area Total	3,102	9,715	8,135	10,319	16,041	16,604	20,461	19,738	18,673	13,292	6,837	5,823	148,740	
SAN JOAQUIN VALLEY AREA														
SWP Agencies														
County of Kings														
Table A	0	0	0	0	0	0	307	2,733	244	0	0	0	3,284	
Table A Point of Delivery through Westlands*	0	0	0	0	192	317	349	407	320	211	136	78	2,010	
Pool A	0	0	0	0	0	16	0	0	3	0	0	0	19	
Pool A through Westlands*	0	0	0	0	21	0	0	0	0	0	0	0	21	

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Pool B	0	0	0	0	0	46	0	0	0	0	0	0	0	0	51
Pool B through Westlands*	0	0	0	0	60	0	0	0	0	0	0	0	0	0	61
Article 56(c) Carryover through Westlands*	73	386	99	0	0	0	0	0	0	0	0	0	0	0	558
Article 21	0	0	0	238	0	0	0	0	0	0	0	0	0	0	238
Article 21 through Westlands*	0	158	16	140	0	0	0	0	0	0	0	0	0	0	314
Agency Total (*excluded from total)	0	0	0	238	0	62	307	2,733	252	0	0	0	0	0	3,592
Dudley Ridge Water District															
Table A	0	278	0	30	2,425	3,004	5,305	4,160	1,219	912	139	24	17,496		
Table A Point of Delivery from Tulare	0	0	0	0	0	500	500	203	250	0	0	0	1,453		
Table A Point of Delivery through Kern*	0	0	0	0	0	4,837	5,532	0	1,767	3,000	3,558	0	18,694		
Table A Transfer to Kern*	0	0	0	0	0	0	0	0	0	0	3,400	0	3,400		
Table A Exchange from Santa Barbara	0	0	0	0	0	0	0	0	0	2,900	0	57	2,957		
Table A Exchange with San Gabriel*	0	0	0	0	0	0	0	0	0	0	242	309	551		
Pool A	0	0	0	0	0	217	0	0	0	0	0	0	217		
Pool B	0	0	0	0	0	606	0	0	0	0	0	0	606		
Article 56(c) Carryover	387	127	0	0	0	0	0	0	0	0	0	0	514		
Article 56(c) sent to Kern*	5,010	0	0	0	0	0	0	0	0	0	0	0	5,010		
Article 21	0	0	1,565	1,972	0	0	0	0	0	0	0	0	3,537		
Article 21 Transfer to Kern*	0	826	4,533	2,770	0	0	0	0	0	0	0	0	8,129		
Article 21 Transfer to Tulare*	0	48	1,272	689	0	0	0	0	0	0	0	0	2,009		
Kern Water Bank to Dudley Ridge	0	0	0	0	0	0	65	0	0	0	0	0	65		
Agency Total (*excluded from total)	387	405	1,565	2,002	2,425	4,327	5,870	4,363	1,469	3,812	139	81	26,845		
Empire West Side Irrigation District															
Table A	0	0	0	0	0	0	0	0	0	0	393	833	1,226		
Table A Transfer to Westlands	0	0	0	0	0	0	400	0	0	0	0	0	400		
Carryover from Previous Years	0	40	111	0	0	0	0	0	0	0	0	0	151		
Unscheduled Water	0	0	138	0	0	0	0	0	0	0	0	0	138		
Agency Total	0	40	249	0	0	0	0	0	0	0	393	833	1,515		
Kern County Water Agency															
Table A	160	681	4,364	6,747	23,244	98,988	146,641	144,182	113,486	90,918	63,735	52,986	746,132		
Table A to Western Hills*	25	33	37	80	138	159	188	163	133	76	49	31	1,112		
Table A from Alameda-Zone 7	0	0	0	0	0	2,021	4,994	2,985	0	0	0	0	10,000		
Table A from Alameda County	0	0	0	0	5,437	2,563	0	0	0	0	0	5,000	13,000		
Table A from Dudley Ridge	0	0	0	0	0	4,837	5,532	0	1,767	3,000	3,558	0	18,694		
Table A Transfer from San Bernardino	0	0	0	0	0	0	0	0	0	0	0	8,066	8,066		

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Table A from Santa Clara	0	0	1,768	2,976	14,017	3,960	4,308	0	0	0	0	0	0	0	27,029
Table A from Metropolitan	0	0	0	2,348	14,544	31,638	67,984	84,450	25,063	17,523	36,253	25,966	0	0	305,769
Table A Transfer from Dudley Ridge	0	0	0	0	0	0	0	0	0	0	3,400	0	0	0	3,400
Table A Transfer from Tulare	0	0	0	0	0	0	5,000	0	1,000	0	0	0	0	0	6,000
Table A Exchange from Santa Barbara	0	0	0	0	0	0	0	0	0	247	901	10,747	0	0	11,895
Table A Exchange from Castaic Lake	0	0	0	0	0	0	0	0	0	0	5,000	0	0	0	5,000
Pool A	0	0	0	0	0	0	0	4,235	0	0	0	0	0	0	4,235
Pool B	0	0	0	0	0	0	0	11,833	0	0	0	0	0	0	11,833
Article 56(c) Carryover	95,941	23,832	0	0	0	0	0	0	0	0	0	0	0	0	119,773
Article 56(c) Carryover from Alameda-Zone 7	0	2,331	3,414	0	0	0	0	0	0	0	0	0	0	0	5,745
Article 56(c) Carryover from Alameda County	0	5,380	1,061	0	0	0	0	0	0	0	0	0	0	0	6,441
Article 56(c) from Dudley Ridge	5,010	0	0	0	0	0	0	0	0	0	0	0	0	0	5,010
Article 56 Exchanged from Santa Barbara	0	141	2,407	0	0	0	0	0	0	0	0	0	0	0	2,548
Article 56(c) Exchanged from Castaic	5,608	0	0	0	0	0	0	0	0	0	0	0	0	0	5,608
Article 56(c) Exchanged from Palmdale	0	4,452	0	0	0	0	0	0	0	0	0	0	0	0	4,452
Article 14(b) Transfer from Santa Clara	0	2,232	0	0	0	0	0	0	0	0	0	0	0	0	2,232
Article 21	0	16,479	86,883	83,272	0	0	0	0	0	0	0	0	0	0	186,634
Article 21 sent from Metropolitan to Arvin-Edison Banking	0	0	0	7,485	0	0	0	0	0	0	0	0	0	0	7,485
Article 21 from Metropolitan	0	0	2,671	3,530	0	0	0	0	0	0	0	0	0	0	6,201
Article 21 Transfer from Alameda	0	0	446	1,513	0	0	0	0	0	0	0	0	0	0	1,959
Article 21 Transfer from Santa Clara	0	0	250	554	0	0	0	0	0	0	0	0	0	0	804
Article 21 Transfer from Dudley Ridge	0	826	4,533	2,770	0	0	0	0	0	0	0	0	0	0	8,129
Kern Water Bank Recovery to Dudley Ridge*	0	0	0	0	0	0	65	0	0	0	0	0	0	0	65
Transfer from Reclamation	0	0	0	0	0	0	0	0	0	0	633	17,385	0	0	18,018
General Conveyance from Santa Clara	0	0	0	0	0	0	0	5,636	28,079	0	0	2,696	0	0	36,411
General Conveyance from Westlands	2,220	1,000	0	0	0	0	0	0	0	0	0	0	0	0	3,220
Agency Total (*excluded from total)	108,939	57,354	107,797	111,195	57,242	144,007	234,459	253,321	169,395	111,688	113,480	122,846	0	0	1,591,723
Oak Flat Water District															
Table A	0	0	0	198	381	388	716	571	164	139	15	72	0	0	2,644
Article 56(c) Carryover	0	27	44	0	0	0	0	0	0	0	0	0	0	0	71
Agency Total	0	27	44	198	381	388	716	571	164	139	15	72	0	0	2,715
Tulare Lake Basin Water Storage District															
Table A	0	0	0	0	0	216	576	2,811	985	1,864	4,293	18,358	0	0	29,103
Table A Point of Delivery through Dudley Ridge*	0	0	0	0	0	500	500	203	250	0	0	0	0	0	1,453
Table A Transfer to Kern*	0	0	0	0	0	0	5,000	0	1,000	0	0	0	0	0	6,000

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries			
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
Table A Transfer to Westlands*	0	0	0	0	500	0	2,000	0	0	0	0	0	0	0	0	2,500
Pool A	0	0	0	0	305	78	0	0	0	0	0	0	0	0	0	383
Pool B	0	0	0	0	0	116	0	955	0	0	0	0	0	0	0	1,071
Article 56(c) Carryover	272	3,496	858	0	0	0	0	0	0	0	0	0	0	0	0	4,626
Article 21	0	915	2,962	1,023	0	0	0	0	0	0	0	0	0	0	0	4,900
Article 21 Transfer from Dudley Ridge	0	48	1,272	689	0	0	0	0	0	0	0	0	0	0	0	2,009
Transfer from Reclamation	0	2,539	0	0	0	0	0	3,642	4,915	0	0	0	0	0	0	11,096
Agency Total (*excluded from total)	272	6,998	5,092	1,712	305	410	576	7,408	5,900	1,864	4,293	18,358	0	0	0	53,188
Recreation/Fish and Wildlife (SWP)																
Department of Parks and Recreation, Cattle	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	4
Department of Fish and Wildlife, O'Neill	64	0	6	6	62	60	89	58	54	47	59	76	0	0	0	581
Department of Fish and Wildlife, Lateral 4	0	1	12	50	0	1	0	0	0	0	64	0	0	0	0	128
Department of Parks and Recreation, O'Neill	0	1	0	1	0	1	1	0	1	3	0	1	0	0	0	9
Department of Parks and Recreation, San Luis	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Agency Total	65	2	19	57	63	62	90	58	55	52	123	78	0	0	0	724
<i>Non-SWP Agencies</i>																
CVP Water Annual Contractors																
Plain View/Musco Family Olive Company	4	22	29	41	60	62	53	51	36	52	33	24	0	0	0	467
U.S. Department of Veterans Affairs, San Joaquin Valley National Cemetery	1	4	1	14	34	41	52	45	36	19	7	5	0	0	0	259
Agency Total	5	26	30	55	94	103	105	96	72	71	40	29	0	0	0	726
Bureau of Reclamation																
Western Hills Water District																
Table A Point of Delivery from Kern	25	33	37	80	138	159	188	163	133	76	49	31	0	0	0	1,112
Westlands Water District																
Table A Point of Delivery from Kings	0	0	0	0	192	317	349	407	320	211	136	78	0	0	0	2,010
Table A Transfer from Empire	0	0	0	0	0	0	400	0	0	0	0	0	0	0	0	400
Table A Transfer from Tulare	0	0	0	0	500	0	2,000	0	0	0	0	0	0	0	0	2,500
Pool A from County of Kings	0	0	0	0	21	0	0	0	0	0	0	0	0	0	0	21
Pool B from County of Kings	0	0	0	0	60	0	0	0	1	0	0	0	0	0	0	61
Article 56(c) from County of Kings	73	386	99	0	0	0	0	0	0	0	0	0	0	0	0	558
Article 21 from County of Kings	0	158	16	140	0	0	0	0	0	0	0	0	0	0	0	314
General Conveyance to Kern*	2,220	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	3,220
Agency Total (*excluded from total)	73	544	115	140	773	317	2,749	407	321	211	136	78	0	0	0	5,864
Reclamation Transfer to Kern*	0	0	0	0	0	0	0	0	0	0	633	17,385	0	0	0	18,018
Reclamation Transfer to Tulare*	0	2,539	0	0	0	0	0	3,642	4,915	0	0	0	0	0	0	11,096

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Kern National Wildlife Refuge	957	549	534	734	1,485	637	460	4,336	4,887	4,948	4,046	2,288	25,861
Recreation	0	1	1	1	1	0	0	0	0	4	0	1	9
Fish and Wildlife	52	0	5	4	49	50	72	47	44	38	100	160	621
Agency Total (*excluded from total)	1,082	1,094	655	879	2,308	1,004	3,281	4,790	5,252	5,201	4,282	2,527	32,355
SWP	107,541	61,864	114,918	115,622	61,327	149,732	244,955	259,746	144,695	117,842	117,995	122,296	1,618,533
Non-SWP	1,014	3,115	570	794	1,629	790	637	8,121	9,918	5,061	4,819	19,863	56,331
San Joaquin Valley Area Total	110,775	65,979	115,488	116,416	62,956	150,522	245,592	273,503	182,692	122,903	122,814	144,855	1,714,495
CENTRAL COASTAL AREA													
<i>SWP Agencies</i>													
San Luis Obispo County Flood Control and Water Conservation District													
Table A	0	170	291	322	375	367	388	421	318	320	118	250	3,340
Article 12(e) Carryover	294	185	0	0	0	0	0	0	0	0	0	0	479
Agency Total	294	355	291	322	375	367	388	421	318	320	118	250	3,819
Santa Barbara County Flood Control and Water Conservation District													
Table A	0	0	0	1,647	2,226	2,285	2,558	0	2,096	1,865	541	1,062	14,280
Table A Exchange to Dudley Ridge*	0	0	0	0	0	0	0	0	0	2,900	0	57	2,957
Table A Exchange to Kern*	0	0	0	0	0	0	0	0	0	247	901	10,747	11,895
Article 56	1,534	1,320	1,185	0	0	0	0	2,510	221	0	0	0	6,770
Article 56 Exchanged with Kern*	0	141	2,407	0	0	0	0	0	0	0	0	0	2,548
Agency Total (*excluded from total)	1,534	1,320	1,185	1,647	2,226	2,285	2,558	2,510	2,317	1,865	541	1,062	21,050
SWP	1,828	1,675	1,476	1,969	2,601	2,652	2,946	2,931	2,635	2,185	659	1,312	24,869
Non-SWP	0	0	0	0	0	0	0	0	0	0	0	0	0
Central Coastal Area Total	1,828	1,675	1,476	1,969	2,601	2,652	2,946	2,931	2,635	2,185	659	1,312	24,869
SOUTHERN CALIFORNIA AREA													
<i>SWP Agencies</i>													
Antelope Valley-East Kern Water Agency													
Table A	0	0	0	1,705	10,665	11,080	12,345	12,097	11,843	10,169	4,865	2,780	77,549
Table A Point of Delivery through Mojave	10	52	57	126	129	143	204	170	144	127	58	964	2,184
Table A Exchange from Palmdale	0	0	0	0	0	0	0	0	0	0	480	2,500	2,980
Article 56(c) Carryover	2,379	2,138	1,371	0	0	0	0	0	0	0	0	0	5,888
Article 21	0	0	1,944	5,685	0	0	0	0	0	0	0	0	7,629
Agency Total	2,389	2,190	3,372	7,516	10,794	11,223	12,549	12,267	11,987	10,296	5,403	6,244	96,230
Castaic Lake Water Agency													
Table A	0	0	1,100	2,123	2,681	3,398	4,598	4,456	3,008	3,350	2,024	2,329	29,067

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Table A Exchange to Kern*	0	0	0	0	0	0	0	0	0	0	5,000	0	5,000
Article 56(c) Carryover	1,371	1,461	892	0	0	0	0	0	0	0	0	0	3,724
Article 56(c) to Kern*	5,608	0	0	0	0	0	0	0	0	0	0	0	5,608
Article 21	0	0	0	400	0	0	0	0	0	0	0	0	400
Agency Total (*excluded from total)	1,371	1,461	1,992	2,523	2,681	3,398	4,598	4,456	3,008	3,350	2,024	2,329	33,191
Coachella Valley Water District													
Table A	0	0	0	0	4,147	15,219	15,219	13,553	0	9,441	15,219	15,219	88,017
Pool A	0	0	0	0	0	0	0	0	596	0	0	0	596
Pool B	0	0	0	0	0	0	0	0	1,666	0	0	0	1,666
Agency Total	0	0	0	0	4,147	15,219	15,219	13,553	2,262	9,441	15,219	15,219	90,279
Crestline-Lake Arrowhead Water Agency													
Table A	0	0	0	0	0	0	56	124	109	85	13	36	423
Table A Transfer from San Bernardino	0	0	0	0	0	0	0	0	0	21	8	2	31
Article 56(c) Carryover	51	0	0	0	0	0	0	0	0	0	0	0	51
Local	0	32	39	44	57	46	64	0	0	0	17	0	299
Agency Total	51	32	39	44	57	46	120	124	109	106	38	38	804
Desert Water Agency													
Table A	0	0	0	0	1,669	6,133	6,133	6,133	0	3,805	6,133	6,133	36,139
Pool A	0	0	0	0	0	0	0	0	240	0	0	0	240
Agency Total	0	0	0	0	1,669	6,133	6,133	6,133	240	3,805	6,133	6,133	36,379
The Metropolitan Water District of Southern California													
Table A	2,990	8,903	6,813	25,080	62,760	89,444	133,940	125,339	149,794	91,583	76,179	84,969	857,794
Table A to Kern*	0	0	0	2,348	14,544	31,638	67,984	84,450	25,063	17,523	36,253	25,966	305,769
Table A to Mojave Water Bank*	185	1,043	472	479	1,749	2,016	4,953	4,421	8,339	9,427	6,795	5,169	45,048
Article 56(c) Transfer from Santa Clara	0	0	8,341	0	0	0	0	0	0	0	0	0	8,341
Pool A	0	0	0	0	8,237	0	0	0	0	0	0	0	8,237
Article 56(c) Carryover	0	21,637	0	15,758	18,145	0	0	0	0	0	0	0	55,540
Article 21	0	24,659	114,165	36,585	0	0	0	0	0	0	0	0	175,409
Article 21 Transfer to Kern*	0	0	2,671	3,530	0	0	0	0	0	0	0	0	6,201
Article 21 Transfer to Arvin-Edison*	0	0	0	7,485	0	0	0	0	0	0	0	0	7,485
Recovery from Arvin-Edison Water Bank	0	8,038	0	15,525	11,858	4,063	0	0	0	0	0	0	39,484
Flexible Withdrawal from Lake Perris	0	9,237	0	0	0	0	0	0	0	0	0	0	9,237
Flexible Withdrawal from Castaic Lake	0	27,294	0	0	0	0	0	0	0	0	0	0	27,294
General Conveyance from Storage	106,423	0	0	0	0	0	0	0	0	0	0	0	106,423
General Conveyance from Santa Clara*	1,835	1,556	248	0	0	0	0	0	0	4,529	0	0	8,168
Agency Total (*excluded from total)	109,413	99,768	129,319	92,948	101,000	93,507	133,940	125,339	149,794	91,583	76,179	84,969	1,287,759

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	2011												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Mojave Water Agency													
Table A	0	0	0	0	0	0	0	0	0	0	0	2,647	2,647
Table A from Metropolitan	185	1,043	472	479	1,749	2,016	4,953	4,421	8,339	9,427	6,795	5,169	45,048
Table A Point of Delivery through AVEK*	10	52	57	126	129	143	204	170	144	127	58	964	2,184
Article 56(c) Carryover	268	0	0	0	0	0	0	0	0	0	0	0	268
Agency Total (*excluded from total)	453	1,043	472	479	1,749	2,016	4,953	4,421	8,339	9,427	6,795	7,816	47,963
Palmdale Water District													
Table A	225	0	936	1,415	1,646	1,176	946	918	413	0	403	1,236	9,314
Table A Exchange to AVEK*	0	0	0	0	0	0	0	0	0	0	480	2,500	2,980
Article 56(c) Carryover	0	567	0	0	0	0	0	0	0	0	0	0	567
Article 56(c) Exchanged with Kern*	0	4,452	0	0	0	0	0	0	0	0	0	0	4,452
Agency Total (*excluded from total)	225	567	936	1,415	1,646	1,176	946	918	413	0	403	1,236	9,881
San Bernardino Valley Municipal Water District													
Table A	0	0	459	3,293	3,664	3,347	3,201	2,088	2,771	1,834	1,529	633	22,819
Table A to Kern*	0	0	0	0	0	0	0	0	0	0	0	8,066	8,066
Table A Transfer to Crestline*	0	0	0	0	0	0	0	0	0	21	8	2	31
Article 56(c) Carryover	2,096	2,385	2,729	0	0	0	0	0	0	0	0	0	7,210
Agency Total (*excluded from total)	2,096	2,385	3,188	3,293	3,664	3,347	3,201	2,088	2,771	1,834	1,529	633	30,029
San Gabriel Valley Municipal Water District													
Table A	0	0	0	0	3,176	3,315	3,379	3,430	3,256	3,441	2,843	200	23,040
Table A Exchange from Dudley Ridge	0	0	0	0	0	0	0	0	0	0	242	309	551
Agency Total	0	0	0	0	3,176	3,315	3,379	3,430	3,256	3,441	3,085	509	23,591
San Geronio Pass Water Agency													
Table A	0	0	264	1,103	1,007	808	868	971	951	983	924	1,005	8,884
Article 56(c) Carryover	860	0	759	0	0	0	0	0	0	0	0	0	1,619
Agency Total	860	0	1,023	1,103	1,007	808	868	971	951	983	924	1,005	10,503
Ventura County Watershed Protection District													
Table A	0	0	0	204	198	154	154	154	154	154	1,283	1,545	4,000
Agency Total	0	0	0	204	198	154	154	154	154	154	1,283	1,545	4,000
Recreation/Fish and Wildlife (SWP)													
Castaic Lagoon	1	30	15	13	7	21	25	40	33	8	16	12	221
Lake Perris	12	25	26	38	63	48	43	73	50	29	4	6	417
Pyramid Lake	3	4	1	1	5	2	2	2	1	0	1	1	23
Silverwood Lake	1	0	5	6	13	13	11	10	8	8	3	3	81
Agency Total	17	59	47	58	88	84	81	125	92	45	24	22	742

Table 9-6 Total Amounts of Water Delivered in 2011, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2011 Total Deliveries
SWP	10,452	107,473	140,349	109,539	131,819	140,380	186,077	173,979	183,376	134,465	119,022	127,698	1,564,629
Non-SWP	106,423	32	39	44	57	46	64	0	0	0	17	0	106,722
Southern California Area Total	116,875	107,505	140,388	109,583	131,876	140,426	186,141	173,979	183,376	134,465	119,039	127,698	1,671,351
SWP WATER													
<i>SWP Long-term Water Supply Contracts</i>													
Table A	3,655	11,228	16,611	50,808	165,496	299,283	442,179	436,818	345,409	259,993	235,834	245,170	2,512,484
Transfer Table A	0	0	0	0	500	0	7,400	0	1,000	21	3,408	2	12,331
Exchange Table A	0	0	0	0	0	0	0	0	0	3,147	6,623	13,613	23,383
Pool Water	0	0	0	0	8,623	1,079	1,477	17,371	2,511	0	0	0	31,061
Article 12(e) Carryover	294	225	111	0	0	0	0	0	0	0	0	0	630
Article 56(c) Carryover	117,013	75,212	27,807	22,116	21,925	0	0	2,510	221	879	0	0	267,683
Article 21	0	43,113	216,707	146,190	1,450	1,691	2,475	2,670	3,344	1,808	1,366	0	420,814
Water Bank Recovery	0	8,038	0	15,525	11,858	4,063	65	0	0	0	0	0	39,549
Flexible Storage Withdrawal	0	36,531	0	0	0	0	0	0	0	0	0	0	36,531
Agency Total	120,962	174,347	261,236	234,639	209,852	306,116	453,596	459,369	352,485	265,848	247,231	258,785	3,344,466
<i>Other Water Supply Contracts</i>													
Solano Settlement	0	0	138	0	0	0	0	0	0	1,123	930	681	2,872
Recreation/Fish and Wildlife	84	62	67	128	166	161	191	206	167	108	150	103	1,593
SWP Total	121,046	174,409	261,441	234,767	210,018	306,277	453,787	459,575	352,652	267,079	248,311	259,569	3,348,931
NON-SWP WATER													
<i>Non-SWP Water Supply Contracts</i>													
Local	44,296	596	3,535	13,048	162,492	154,033	192,470	182,408	72,073	20,013	123,152	96,391	1,064,507
Vallejo Permit	0	36	35	19	36	17	221	234	134	0	0	409	1,141
Subtotal	44,296	632	3,570	13,067	162,528	154,050	192,691	182,642	72,207	20,013	123,152	96,800	1,065,648
CVP/Reclamation													
Water Transfer to SWP contractor	0	2,539	0	0	0	0	666	3,642	4,915	0	633	17,385	29,780
Annual Contract	5	26	30	55	94	103	105	96	72	71	40	29	726
Conveyance	110,478	7,556	248	0	0	0	0	5,636	28,079	4,529	0	2,696	159,222
Kern National Wildlife Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0
Recreation/Fish and Wildlife	1,009	550	540	739	1,535	687	532	4,383	4,931	4,990	4,146	2,449	26,491
Subtotal	111,492	10,671	818	794	1,629	790	1,303	13,757	37,997	9,590	4,819	22,559	216,219
Non-SWP Total	155,788	11,303	4,388	13,861	164,157	154,840	193,994	196,399	110,204	29,603	127,971	119,359	1,281,867
Grand Total	276,834	185,712	265,829	248,628	374,175	461,117	647,781	655,974	462,856	296,682	376,282	378,928	4,630,798

Table 9-7 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962-2011 (acre-feet)

Year	Annual Table A Amounts According to Long-term Water Supply Contracts							Water Conveyed							Total (16)	
	Deliveries							Losses and Storage Changes ^d								
	Upper Feather River Area (1)	North Bay Area (2)	South Bay Area (3)	San Joaquin Valley Area (4)	Central Coastal Area (5)	Southern California Area (6)	Total (7)	Table A Water (8)	Article 21, Surplus, and Unscheduled Water ^a (9)	Other Water ^b (10)	Feather River Diversions ^c (11)	Fish and Wildlife/ Recreation Water (12)	Subtotal (13)	Initial Fill Water (14)		Losses and Storage Changes ^d (15)
1962	0	0	0	0	0	0	0	0	0	18,289	0	0	18,289	9	272	18,570
1963	0	0	0	0	0	0	0	0	0	22,456	0	0	22,456	71	185	22,712
1964	0	0	0	0	0	0	0	0	0	32,507	0	0	32,507	171	152	32,830
1965	0	0	0	0	0	0	0	0	0	44,105	0	0	44,105	93	729	44,927
1966	0	0	0	0	0	0	0	0	0	67,928	0	0	67,928	0	1,746	69,674
1967	0	0	11,538	0	0	0	11,538	0	0	53,605	0	0	65,143	8,328	4,212	77,683
1968	550	0	109,900	77,350	0	3,700	191,500	121,534	171,709	14,777	866,926	0	1,174,946	498,926	117,906	1,791,778
1969	620	0	98,700	163,075	0	5,000	267,395	72,397	193,020	18,829	794,374	0	1,078,620	510,614	72,196	1,661,430
1970	700	0	114,200	202,000	0	5,700	322,600	133,024	233,993	38,080	759,759	0	1,164,856	23,947	2,435	1,191,238
1971	890	0	116,200	251,800	0	6,700	375,590	296,019	357,340	44,119	778,362	8	1,475,948	7,853	5,812	1,489,513
1972	970	0	118,300	413,066	0	209,423	741,759	423,964	611,801	66,638	817,398	6,489	1,926,290	100,274	53,062	2,079,626
1973	1,100	0	120,400	383,652	0	481,100	986,252	296,416	694,388	42,511	800,743	1,155	1,835,213	204,638	53,798	2,093,649
1974	1,230	0	122,400	460,650	0	597,920	1,182,200	417,676	874,077	46,224	911,613	2,118	2,251,708	237,554	10,657	2,499,919
1975	1,610	0	124,500	545,809	0	714,950	1,386,869	622,902	1,223,990	63,793	862,218	3,377	2,776,280	103,352	(94,606)	2,785,026
1976	1,990	0	126,500	543,417	0	836,480	1,508,387	580,110	1,373,002	115,217	946,440	1,745	3,016,514	61,122	(681,025)	2,396,611
1977	2,420	0	128,600	581,400	0	954,901	1,667,321	0	574,155	389,065	581,994	1,111	1,546,325	0	(131,151)	1,415,174
1978	1,850	0	130,700	635,900	0	1,049,584	1,818,034	16,914	1,452,699	121,225	786,517	1,691	2,379,046	64,443	717,370	3,160,859
1979	2,130	0	132,700	702,685	0	1,190,573	2,028,088	648,389	1,659,896	187,630	882,549	1,766	3,380,230	12,302	(83,430)	3,309,102
1980	1,810	500	134,800	758,100	1,946	1,317,614	2,214,770	404,557	1,529,749	46,459	875,045	2,131	2,857,941	0	(26,606)	2,831,335
1981	1,940	650	137,000	818,000	2,813	1,432,065	2,392,468	908,428	1,909,562	279,161	838,557	4,688	3,940,396	0	(802,263)	3,138,133
1982	1,970	800	139,200	876,500	5,626	1,550,449	2,574,545	215,873	1,750,024	154,882	776,330	4,646	2,901,755	0	480,752	3,382,507
1983	2,000	950	141,400	867,118	8,439	1,681,257	2,701,164	13,019	1,184,869	181,453	602,905	7,849	1,990,095	0	(90,997)	1,899,098
1984	3,630	1,100	143,600	979,211	12,698	1,744,098	2,884,337	262,917	1,588,619	381,024	832,332	7,040	3,071,932	0	(140,182)	2,931,750
1985	3,760	1,250	145,800	1,019,049	21,138	1,864,849	3,055,846	307,672	1,995,453	404,842	870,008	4,033	3,582,008	0	92,885	3,674,893
1986	4,190	1,400	148,100	1,091,946	28,210	1,983,890	3,257,736	36,620	1,995,636	193,606	791,737	3,865	3,021,464	0	284,380	3,305,844
1987	4,620	1,550	150,300	1,188,500	35,204	2,103,941	3,484,115	114,907	2,130,086	377,592	831,947	7,672	3,462,204	0	(390,413)	3,071,791
1988	5,060	15,471	152,500	1,246,100	43,722	2,225,482	3,688,335	0	2,385,122	507,076	794,834	4,889	3,691,921	0	(92,850)	3,599,071
1989	5,500	24,615	156,700	1,290,400	56,342	2,424,633	3,958,190	0	2,853,747	474,559	830,500	8,135	4,166,941	0	447,917	4,614,858
1990	6,040	28,190	160,900	1,313,450	70,486	2,500,600	4,079,666	90	2,582,151	424,697	875,099	9,262	3,891,299	0	(528,869)	3,362,430
1991	11,880	29,590	166,400	1,338,011	70,486	2,510,200	4,126,567	3,521	549,113	551,051	565,395	4,879	1,673,959	0	167,435	1,841,394

Table 9-7 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2011 (acre-feet)

Year	Annual Table A Amounts According to Long-term Water Supply Contracts							Water Conveyed						Total (16)		
	Deliveries							Subtotal (13)	Initial Fill Water (14)	Losses and Storage Changes ^d (15)						
	Upper Feather River Area (1)	North Bay Area (2)	South Bay Area (3)	San Joaquin Valley Area (4)	Central Coastal Area (5)	Southern California Area (6)	Total (7)				Article 21, Surplus, and Unscheduled Water ^a (9)	Other Water ^b (10)	Feather River Diversions ^c (11)		Fish and Wildlife/ Recreation Water (12)	
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	4,138,816	1,471,454	1,156	144,789	613,978	2,605	2,233,982	0	(63,541)	2,170,441
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	4,146,966	2,315,235	0	254,854	822,589	2,609	3,395,287	0	72,612	4,121,410
1994	12,000	37,215	182,000	1,342,300	70,486	2,510,200	4,154,201	1,749,351	112,625	236,739	874,018	8,200	2,980,933	0	(295,405)	2,685,528
1995	12,050	44,030	184,000	1,342,300	70,486	2,510,200	4,163,066	1,967,093	64,330	78,425	860,077	2,575	2,972,500	0	69,536	3,042,036
1996	12,100	48,225	186,000	1,301,630	70,486	2,492,900	4,111,341	2,514,825	28,647	251,391	934,997	3,907	3,733,767	86	491,550	4,225,403
1997	12,150	49,315	188,000	1,297,300	45,201	2,492,900	4,084,866	2,325,775	21,432	322,000	993,211	4,146	3,666,564	527	(11,806)	3,655,285
1998	12,200	50,420	188,000	1,272,300	45,201	2,517,900	4,086,021	1,725,519	20,288	134,682	872,738	2,108	2,755,335	0	(132,491)	2,622,844
1999	12,250	51,500	188,000	1,272,300	70,486	2,519,900	4,114,436	2,738,891	158,070	85,312	1,108,672	4,324	4,095,269	0	(189,525)	3,905,744
2000	14,000	55,945	210,000	1,205,300	70,486	2,565,900	4,121,631	3,200,677	308,785	332,654	1,085,886	4,030	4,932,032	0	(20,103)	4,911,929
2001	14,670	66,561	220,000	1,185,519	70,486	2,566,900	4,124,136	1,690,926	43,435	477,835	1,078,656	2,929	3,293,781	0	159,983	3,453,764
2002	14,730	67,396	220,000	1,195,219	70,486	2,557,200	4,125,031	2,573,030	37,165	307,162	1,132,938	3,694	4,053,989	0	80,709	4,134,698
2003	14,790	68,231	220,400	1,194,819	70,486	2,558,200	4,126,926	2,901,041	59,828	251,447	1,008,093	2,846	4,223,255	0	459,377	4,682,632
2004	13,100	69,056	222,619	1,182,700	70,486	2,569,100	4,127,061	2,599,536	218,496	385,088	1,174,672	2,865	4,380,657	0	108,840	4,489,497
2005	10,800	69,481	222,619	1,170,000	70,486	2,582,300	4,125,686	2,828,406	731,083	96,932	1,074,706	1,506	4,732,633	0	529,347	5,261,980
2006	11,124	69,856	222,619	1,170,000	70,486	2,582,800	4,126,885	2,973,351	621,339	119,403	1,112,551	1,936	4,828,580	0	(119,981)	4,708,599
2007	11,520	70,231	222,619	1,170,000	70,486	2,584,450	4,129,306	2,081,217	309,973	449,935	1,217,990	2,581	4,061,696	0	(524,851)	3,536,845
2008	39,120	70,606	222,619	1,170,000	70,486	2,593,100	4,165,931	1,234,240	2,729	488,818	1,109,563	2,778	2,838,128	0	(758,813)	2,079,315
2009	39,190	70,981	222,619	1,170,000	70,486	2,593,100	4,166,376	1,232,753	6,032	527,207	1,149,291	2,047	2,918,189	0	(31,319)	2,886,870
2010	39,260	76,531	222,619	1,140,000	70,486	2,623,100	4,171,996	1,930,929	7,505	559,553	1,005,986	1,167	3,505,140	0	461,751	3,966,891
2011	39,340	76,581	222,619	1,140,000	70,486	2,623,100	4,172,126	2,847,572	420,814	332,277	1,028,542	1,593	4,630,798	0	358,354	4,989,152
Total	426,734	1,284,857	7,347,990	42,353,476	1,716,260	80,458,759	133,588,076	76,787,560	9,070,681	11,200,762	39,532,736	148,995	132,109,936	1,834,310	749,244	139,324,288

^a Values include amounts of deliveries to short-term contractors (Mustang Water District, 1970–1972; Tracy Golf and Country Club, 1974, 1979, and 1980; Green Valley Water District, 1974, 1975, 1978, 1979, 1980, and 1985; and Granite Construction Company, 1980).

^b Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP water contractors.

^c Includes amounts of water diverted under various water rights agreements.

^d Amounts reflect net effect of (1) operational losses from SWP transportation facilities; (2) changes in reservoir storage south of the Delta; (3) storable local inflows to SWP reservoirs; (4) side inflow to San Luis Canal; and (5) inflow into California Aqueduct from Kern River Intertie.



Chapter 10 Power Resources

Wind turbines in the Sacramento-San Joaquin Delta.

Significant Events in 2011

Power generating facilities on the West Branch and East Branch of the State Water Project (SWP) were renamed South SWP Hydropower by a Federal Energy Regulatory Commission (FERC) order amending Project No. 2426 on July 7, 2011.

Senate Bill 224, passed in 2011, exempts all Department of Water Resources' (DWR) energy-related contracts from approval by the Department of General Services. This streamlines the energy contract approval process and allows DWR more flexibility with regard to its selection of contractors under certain conditions.

Energy used at the 29 SWP pumping and generating plants totaled 8.55 million megawatt hours (MWh). To meet the energy needs of the SWP, DWR purchased 4.40 million MWh of energy at a cost of \$135 million.

DWR purchased 3.46 million MWh of short-term energy under the WSPP agreement from ten WSPP marketers and one public electric utility at a cost of \$121 million.

Pursuant to its excess power sales agreements, DWR sold 1.19 million MWh of energy to one utility and six WSPP power marketers totaling \$44 million in revenues.

Information for this chapter was provided by the State Water Project Analysis Office, the SWP Power and Risk Office, and the Hydropower License Planning and Compliance Office.

Long-term State Water Project (SWP) water contractors depend on the SWP to obtain economical sources of power in order to deliver affordable water. Consequently, the Department of Water Resources (DWR) administers a comprehensive power resources program. Key elements of the program include studies of power resources for future needs, acquisition of long-term power resources and transmission services, short-term purchases or sales of power, and the strategic operation of generation and pumping facilities.

Power Resources Program

The goals of the SWP power resources program are to:

- obtain reliable, environmentally sensitive, and competitively priced power resources and transmission services sufficient to operate the SWP;
- develop and manage power resources to minimize the cost of water deliveries to SWP water contractors;
- meet responsibilities and criteria of the Western Electricity Coordinating Council; and
- conform to regulations of the Federal Energy Regulatory Commission (FERC).

To achieve these goals, DWR constructed its own power facilities and enters into long-term contracts and short-term arrangements with other electric utilities and with the California Independent System Operator (CAISO) for transmission access and for power purchases and sales. DWR's generators and pumps also provide a mix of regulation, spinning, and nonspinning reserves to the CAISO's ancillary services market. In addition, DWR's power resources program takes advantage of SWP water storage and conveyance capacities to control pump loads and generation in a cost-effective manner.

Major Electric Utility Industry Developments

In 2011, CAISO continued to augment its new market structure—Market Redesign and Technology Upgrade (MRTU)—with new products and to fix issues with market behavior and price fluctuations.

Phase 2 of CAISO's bidding and mitigation of commitment costs initiative was implemented in April 2011. In addition to changing the gas delivery point from SoCal Border to SoCal CityGate, which allowed generators located in the fuel regions south of path 15 to take advantage of the natural gas price representative of the fuel costs, CAISO allowed generators to independently elect cost options, either proxy or registered, for start-up and minimum load costs. This allowed resource owners, including DWR, to recover their operating costs in a more efficient manner.

In May 2011, CAISO made a tariff filing with FERC to approve the Reliability Demand Response Product, a wholesale demand response product that enables compatibility with, and integration of, existing retail emergency-triggered demand response programs into the CAISO market and operations. This includes demand response resources that desire to be dispatched only under particular system conditions. This initiative reduced barriers to demand response as contemplated in FERC Order 719.

In August 2011, CAISO approved the flexible ramping constraint, an interim compensation methodology to the flexible ramping product initiative, which began in November 2011. The constraint and the product are CAISO's response to the additional burdens that increasing renewables places on ramping needs. DWR protested the proposed cost allocation and advocated that the cost allocation should better align with cost causation principles, which would result in intermittent supply that causes the additional burdens to bear the costs associated with the burdens.

CAISO continued to refine the Renewable Integration Market and Product Review (RIMPR) initiative that started in July 2010.

In November 2011, CAISO released its Draft Final Proposal for RIMPR Phase 1, which identified short-term solutions for integrating renewable resources onto the grid such as lowering the energy bid floor, allowing variable energy resources to submit decremental bids, and bid cost recovery changes. RIMPR Phase 2 began in April 2011 and focused on mid- to long-term solutions.

The development of convergence bidding was finalized in 2010, with CAISO implementation occurring on February 1, 2011. Convergence bidding was intended to increase market liquidity and provide generator participants a hedge for real-time outages. These benefits did not entirely materialize; instead, increased price divergence and higher Real Time Imbalance Energy Offset charges occurred. By the summer of 2011, CAISO's analysis indicated that market participants were paying an additional \$7.5 million per month because the two-settlement system allowed market participants to "game" the difference between Hour Ahead Scheduling Process and Real Time Dispatch prices. Following many stakeholder comments, including those by DWR, CAISO filed for a suspension of convergence bidding at the interties, which FERC granted on November 28, 2011.

Convergence bidding internal to the CAISO was left in place.

As part of a coordinated effort between utilities, developers, State agencies, and federal agencies to meet the State's policy goal of 33 percent renewable energy by 2020, the Renewable Energy Transmission Initiative (RETI) Phase 2B report was finalized in 2010, and as a result, in 2011 RETI released its updated Cost of Generation Model. Phase 2B included updates and improvements to RETI's economic models and technology assumptions in support of conceptual transmission plans for major upgrades to California's transmission system to deliver renewable energy to consumers, with a focus on identifying competitive renewable energy zones.

To meet an increase in renewable generator requests to connect to the transmission system, CAISO initiated the Generator Interconnection Procedures Phase 1 in 2010 to combine its large and small generator interconnection procedures into a single annual cluster study process. In 2011, CAISO continued to address carryover issues into Phase 2, including cost recovery for abandoned facilities, financial security posting caps, and allowable generator project size reductions.

DWR Participation in Electric Utility Industry Activities

DWR continued to participate in CAISO's stakeholder processes to help ensure that the MRTU tariff, CAISO business practice manuals, and MRTU functional simulations are compatible with operations of wholesale market participants including the SWP. DWR's participation in CAISO stakeholder processes focused on the following primary elements:

- Market Initiatives Roadmap;
- RIMPR Phase 1 and Phase 2;
- Bid Cost Recovery;

- Regulatory must-run pump load;
- Reliability Demand Response Product;
- Grid Management Charge rate structure for 2012;
- Dynamic transfer;
- Multi-stage generator enhancement;
- Load Granularity Refinements;
- Barriers to demand response;
- Real-time imbalance energy offset costs;
- Convergence Bidding;
- Participating Load refinement;
- Flexible ramping;
- Regulation energy management;
- Generator Interconnection Procedures initiatives;
- Transmission planning;
- 2012 Local Capacity procurement;
- Annual Resource Adequacy processes including the Path 26 allocation, import allocation, and net qualifying capacity;
- Interim Capacity Procurement Mechanism tariff language;
- Procurement of Calpine's Sutter Plant under the Capacity Procurement Mechanism; and
- DWR, as the Local Regulatory Authority for the SWP, updated its Resource Adequacy Program policy.

In addition, DWR participated in the California Energy Commission's planning processes by submitting a demand forecast to the California Energy Commission.

Besides CAISO and California Energy Commission stakeholder processes, DWR participated in FERC proceedings to help ensure that various market requirements or cost allocation mechanisms were appropriately structured. This included the following major processes and litigations (with FERC docket number given in parenthesis, if applicable):

- CAISO's Treatment of Participating Load within Demand Response and Order 719

- (ER11-2574, ER11-3616, ER11-4100, RM11-17-001);
- CAISO's Integration of Variable Energy Resources (RM11-10);
- CAISO's Dynamic Transfer (ER11-4161);
- CAISO's Load Granularity Refinement (ER06-615);
- CAISO's Convergence Bidding (ER11-4384, ER11-4580);
- CAISO's Bid Cost Recovery Gaming (ER11-3713, ER11-3856);
- CAISO's Flexible Ramping Constraint (EL12-50);
- Non-resource specific resource adequacy resource tariff (ER-11-4151-000);
- Non-resource specific resource adequacy resource outage reporting requirement (ER-11-4733-000);
- FERC's Electric Quarterly Report filing requirements changes (RM10-12);
- FERC's Notice of Proposed Rulemaking for Electronic Submission of Market Data (RM11-17);
- San Diego Gas & Electric Company's annual Transmission Revenue Balancing Account Adjustment and Transmission Access Charge Balancing Account Adjustment (ER11-2430);
- Southern California Edison's (SCE) ROE adder request for Whirlwind (ER11-10);
- City of Anaheim's revised annual Transmission Revenue Balancing Account Adjustment (NJ11-6);
- SCE's revised tariff for FERC's order authorizing SCE to recover 100 percent of Construction Work In Progress for four new transmission projects through its existing ratemaking mechanism (ER11-3198);
- SCE's revised Transmission Access Charge Balancing Account Adjustment (ER11-3248);
- City of Anaheim's revised base Transmission Revenue Requirement and High Voltage Transmission Revenue Requirement (ER11-3594);

- SCE's proposed Formula Rate (ER11-3697); and
- City of Riverside's revised Transmission Revenue Requirement (ER11-3984).

Bulk Electric System Reliability Standards

Background

The Energy Policy Act of 2005 assigned ownership of the Bulk Electrical System reliability to FERC and required the creation of an Electric Reliability Organization. The North American Electric Reliability Corporation (NERC) was named the Electric Reliability Organization by FERC in July 2006 and was tasked with establishing reliability standards for the Bulk Electrical System. Compliance with NERC reliability standards is mandatory.

The Western Electricity Coordinating Council is the implementation vehicle for promoting regional electric service reliability in both western Canada and the western United States. The Western Electricity Coordinating Council has oversight for implementation of these standards and validation of compliance, including assessment of penalties and/or sanctions.

Details of the NERC standards and the attributes of the compliance program appear in Bulletin 132-11.

NERC Reliability Compliance—Program Goals

DWR is committed to providing an effective reliability compliance program. In addition, DWR strives to achieve a culture of compliance that supports its key objectives of safety and reliability.

DWR established its compliance program to ensure strict compliance with NERC's mandatory reliability standards. These standards include specific impacts on operations, maintenance, physical security,

and cyber security. The compliance program performs program audits and reviews to ensure successful and ongoing compliance. Audits and reviews are done by the governance side of the compliance program and include only staff that are independent of any responsibility for meeting the reliability standards. Consultants or contractors can be used for providing the objectivity that is required.

DWR's Compliance Responsibility

DWR is currently registered with NERC for 6 of 15 functional areas. These are:

- Transmission Owner (TO);
- Load Serving Entity (LSE);
- Generation Owner (GO);
- Generation Operator (GOP);
- Purchasing and Selling Entity (PSE); and
- Resource Planner (RP).

DWR organizations responsible for the registered functional areas reside within the:

- Plant Asset Management Office;
- State Water Project Operations Control Office;
- Field Division offices;
- Operations Support Office;
- State Water Project Power and Risk Office; and
- Division of Engineering.

All management and staff in these organizations are required to support DWR's compliance efforts.

DWR has continued the work required to meet the compliance requirements of the reliability standards. The fourth self-certification was completed in January 2011, involving operations, maintenance, and engineering functions, and initial work on critical cyber assets. This process requires DWR to certify that it is currently in compliance with the requirements

of each standard or provide a violation report supported by a mitigation plan to resolve outstanding items. Violations may lead to financial penalties or reduced operating flexibility.

Operations and maintenance requirements have increased and have been aggressively pursued. The work to remain in compliance has increased in the current year and is likely to be expanded as new standards are developed. Required mitigation plans were submitted as a result of self audits. Cyber security standards (Critical Infrastructure Protection) have progressed to include technical revisions and initial administrative procedures.

All personnel were involved in preparations for the February 2012 audit to include a pre-audit process to reduce risks.

Hydropower License Planning and Compliance

Compliance with FERC license terms and conditions is an important function of SWP organizations. DWR's record of compliance is significant and is an important consideration of FERC. FERC requires strict compliance with license terms and conditions and has the authority to levy fines for noncompliance. In addition to FERC setting license requirements and requiring periodic submittals, DWR is subject to safety, security, and environmental inspections and is required to comply with all inspection findings.

Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with FERC requesting a new license for the Oroville Facilities (FERC Project No. 2100). The existing 50-year hydropower license expired January 31, 2007, and, until a new license is issued, FERC is issuing annual licenses.

FERC issued the final environmental impact statement on May 18, 2007. DWR certified the final environmental impact report on July 22, 2008, and filed it with the State Water Resources Control Board the same day. One month later, Butte and Plumas counties filed a lawsuit challenging the adequacy of the final environmental impact report.

On February 11, 2010, the Attorney General, on behalf of DWR, informed Butte and Plumas counties that DWR was seeking \$675,000 in payment for the costs of preparing the administrative record; and on July 21, 2011, the Superior Court granted DWR's request for payment.

On November 19, 2010, DWR and Pacific Gas & Electric Company (PG&E) submitted the final Habitat Expansion Plan for Central Valley salmon and steelhead to the National Marine Fisheries Service for approval. The Habitat Expansion Plan proposed actions on the Lower Yuba River to meet the Habitat Expansion Agreement (HEA) goal of providing spawning habitat sufficient to accommodate an estimated net increase of 2,000 to 3,000 spring-run Chinook Salmon in the Sacramento River Basin. On December 24, 2010, DWR filed a notice of intent to withdraw from the HEA since the December 15, 2010, water quality certification for the Oroville Facilities Relicensing included terms that were materially inconsistent with the terms of the HEA. The HEA was executed as an off-license agreement, not subject to FERC's jurisdiction. However, Condition S9 of the certification required implementation of the HEA, which would automatically be incorporated into the new FERC license. On May 10, 2011, DWR rescinded its notice of intent to withdraw from the HEA since the HEA parties agreed to amend the HEA to resolve the inconsistencies related to the water quality certification. The amended HEA was finalized and executed in counterpart with an effective date of May 9, 2011.

The following is a partial list of SWP facilities that will be subject to the new license terms and conditions:

- Oroville Dam and Lake Oroville;
- Hyatt Pumping-Generating Plant;
- Robie Thermalito Pumping-Generating Plant;
- Thermalito Diversion Dam Powerplant;
- Thermalito Diversion Dam;
- Feather River Fish Barrier Dam;
- Feather River Fish Hatchery;
- Thermalito Power Canal;
- Thermalito Forebay; and
- Thermalito Afterbay.

South SWP Hydropower

DWR operates power generating facilities on the West Branch and East Branch of the SWP. These facilities are authorized by the hydropower license issued by FERC for Project No. 2426. The project was renamed South SWP Hydropower by a FERC order amending the license on July 7, 2011.

In October 2009, FERC issued an order amending Article 52 and Exhibit S of FERC Project No. 2426. The order was issued in response to DWR's 2005 application for an amendment to revise the minimum stream flow requirements and fish stocking practices in Piru Creek below Pyramid Dam. The stream flow revisions were requested to reduce impacts to the listed arroyo toad and other special-status species. FERC's order also acknowledged the Department of Fish and Wildlife and the National Marine Fisheries Service deliberations on future fish stocking practices in Piru Creek and provided 120 days for DWR to file a plan and schedule for providing catchable Rainbow Trout. DWR filed the plan with FERC on May 27, 2010. On August 26, 2010, FERC issued an order modifying and approving DWR's arroyo toad and sensitive species monitoring plan for Piru Creek.

On October 11, 2011, DWR filed an application to amend ordering paragraph (D) and defer development of the fish stocking program until the completion of the biological opinion regarding fish stocking practices in Piru Creek.

On April 24, 2010, DWR executed Amendment No. 2 to the 1969 Memorandum of Understanding with the U.S. Forest Service regarding operation of Project No. 2426 in the Los Padres and Angeles national forests. The amendment transferred the responsibility for operation and maintenance of certain recreation sites and management of public recreation activities at the Pyramid Lake Recreation Area from the U.S. Forest Service to DWR. The amendment had an effective date of January 1, 2011, and was executed to cooperatively improve facility conditions identified in a 2007 FERC inspection. In order to keep the facilities open to the public, DWR explored numerous options for recreation management and solicited the help of public recreation agencies, such as the California Department of Parks and Recreation and Los Angeles County Department of Parks and Recreation. However, DWR was unable to reach agreement with the public agencies and ultimately contracted with a private recreation concessionaire. On January 1, 2011, Parks Management Company started its 10-year contract with DWR.

Existing SWP Power Facilities

Figure 10-1 shows the names, locations, and nameplate capacities of DWR's primary power facilities.

Hydroelectric

Economic hydroelectric generation provides the largest share of SWP power resources. The combined Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt hours (kWh) of energy in a median water year, while the



Figure 10-1 Names, Locations, and Nameplate Capacities of Primary Power Facilities

3 megawatts (MW) from the Thermalito Diversion Dam Powerplant adds another 24 million kWh per year.

Generation at California Aqueduct recovery plants—Alamo, Devil Canyon, Gianelli, Mojave Siphon, and Warne—varies with the amount of water conveyed. These five plants generate about one-sixth of the total energy used by the SWP.

Coal

Since July 1983, under the *Participation Agreement Reid Gardner Unit No. 4* between DWR and NV Energy (NVE), DWR has received energy from Reid Gardner Powerplant, a coal-fired facility in Nevada. Reid Gardner Powerplant consists of four units. DWR owns 67.8 percent of Unit 4, and NVE owns the remainder of Unit 4, as well as all of Units 1, 2, and 3. Under this agreement, DWR receives up to 235 MW from Unit 4, subject to NVE's limited right to interrupt DWR's energy deliveries. Whenever NVE interrupts DWR's scheduled energy, DWR receives payment based on NVE's combustion turbine costs. The Reid Gardner agreement expires in July 2013.

DWR Power Planning Activities

In 2011, DWR completed a power planning study of the economic viability of a second unit at the Alamo Powerplant, which would be a qualified renewable small hydroelectric facility. The project was shown to provide substantial energy and greenhouse gas reduction benefits to DWR. Following the power planning study, DWR initiated a design study to determine whether a surge chamber would be required and to conclude the project cost estimates. A project implementation decision will be made following completion of the design and cost studies.

DWR also studied two projects, the San Luis Transmission Project and the Delta

Hub Transmission Project, that would have changed the interconnection of several SWP facilities from CAISO to the Western Area Power Authority. Connecting to the Western Area Power Authority was determined to have the potential to lower transmission costs. However, the studies concluded that reductions in transmission costs were more than offset by increases in energy and operations costs. Consequently, DWR decided not to proceed with the interconnection change.

Contractual Resource Arrangements

Through joint development, DWR obtains a significant amount of capacity and energy for SWP operations from other utilities throughout California and the Southwest. However, with the implementation of the CAISO MRTU in April 2009, and implementation of CAISO's power markets that provide access to affordable day-ahead and real-time energy, DWR is less reliant on marketers and other utilities to meet its net energy needs.

Joint Developments

In 1966, DWR entered into a contract with the Los Angeles Department of Water and Power (LADWP) for joint development of the West Branch of the California Aqueduct. LADWP constructed and operates Castaic Powerplant, which is a pumped-storage facility connected to the LADWP transmission system at the Sylmar Substation. DWR receives capacity and energy at the Sylmar Substation based on weekly water schedules through the West Branch.

Gianelli Pumping-Generating Plant is a joint-use facility of DWR and the Bureau of Reclamation. DWR's share is 222 MW, and the Bureau of Reclamation's share is 202 MW.

Long-term Purchase Agreements

In 1979, DWR entered into a contract with Kings River Conservation District to receive the output of the 165 MW hydroelectric Pine Flat Powerplant. The power plant supplies the SWP with about 400 million kWh of energy in median water years.

DWR also contracts for the energy output of five hydroelectric plants totaling 30 MW owned and operated by The Metropolitan Water District of Southern California (Metropolitan).

In May 2010, DWR entered into an agreement with the Northern California Power Agency and various public agencies to finance, construct, operate, and maintain the Lodi Energy Center—a new 280 MW natural gas combined cycle combustion turbine generation facility that the Northern California Power Agency would own and operate, and from which DWR would receive 33.5 percent of the output.

Construction of the Lodi Energy Center began in July 2010 and continued on schedule through 2011. The facility is planned to be operational in 2012.

In support of its Renewable Energy Procurement Plan, DWR issued a request for proposal in November 2010 to procure renewable resources. However, primarily due to strict bidding requirements, DWR received no qualified responses by the January 2011 due date. To remedy this problem, DWR drafted a more flexible request for proposal to be issued in early 2012. This effort was facilitated by the introduction and passage of Senate Bill 224, which exempted DWR from certain contracting requirements.

Short-term Purchase Agreements

DWR typically transacts with member utilities and energy marketers of the WSPP. In 2011, these transactions included capacity to meet the requirements of

resource adequacy, which is a planning and procurement process to ensure adequate resources. In addition to transactions under the WSPP master agreement, DWR can purchase surplus energy from Metropolitan's Colorado River Aqueduct system according to the terms of the 1988 Coordination Agreement between DWR and Metropolitan. This agreement also provides for monthly surplus firm and economy energy sales from DWR to Metropolitan and energy exchanges between DWR and Metropolitan.

Load Management

DWR operates its pumps through an extensive computerized network. This control system, coupled with the operating flexibility of DWR's pumping and generating plants provided by storage reservoirs, allows DWR to maximize pumping during off-peak periods when power costs are lower—usually at night—and maximize power generation during on-peak periods when power costs are higher. By taking advantage of this scheduling flexibility, when not restricted by operating requirements, SWP pump load and generation are optimized to reduce the net cost of power needed for SWP water deliveries.

Demand Response

DWR is the largest single supplier of demand response in the CAISO market via a Participating Load Agreement under which DWR bids SWP load to be curtailed by CAISO when the price of energy in the CAISO market reaches DWR's bid price. Due to DWR's water delivery priority, these bids are normally restricted to contingency events.

Contractual Transmission Agreements

Although able to develop or construct transmission independently, DWR depends on other sources for transmission services. CAISO, PG&E, and SCE are the primary providers of both transmission

interconnections and network transmission service for SWP's power resources and pumping loads.

Under the Comprehensive Agreement with PG&E, DWR interconnects SWP power resources and pumping loads and receives 1,300 MW of firm network transmission service over the PG&E transmission system to serve SWP pump loads and power resources in Northern and Central California. Upon implementation of CAISO's MRTU on April 1, 2009, transmission service to DWR under the Comprehensive Agreement is limited to point-to-point service. The remaining transmission service in Northern and Central California, which cannot be provided through the point-to-point service provided under the Comprehensive Agreement, is received from CAISO. Through the Comprehensive Agreement, DWR also provides a remedial action scheme to PG&E whereby certain SWP pumping and generating plants can be instantaneously curtailed under certain predefined emergency events.

In Southern California, DWR receives transmission service for SWP loads and resources through CAISO. Additionally, DWR has interconnection and wholesale distribution service agreements with SCE for service over SCE's distribution transmission system from the CAISO interchange points to SWP loads and resources.

Under the participation agreement with NVE, DWR receives 235 MW of firm transmission service over NVE's transmission system between Reid Gardner Unit 4 and the El Dorado Substation. Under the Firm Transmission Service Agreement between SCE and DWR, DWR receives 235 MW of firm transmission service over SCE's transmission system between El Dorado Substation and the Pastoria and Vincent substations.

SWP Power Operations in 2011

Tables 10-1 through 10-4 present historical information about SWP power operations for calendar year 2011, including energy consumed, generated, purchased, and sold.

Energy Consumed

In 2011, energy used at the 29 SWP pumping and generating plants totaled 8.55 million megawatt hours (MWh). According to the terms and conditions of various water conveyance contracts and exchange agreements, some water belonging to the Central Valley Project is pumped through Banks and Dos Amigos pumping plants and Gianelli Pumping-Generating Plant. The Bureau of Reclamation furnishes additional energy for this purpose.

Table 10-1 shows the amount of energy used each month at SWP pumping and power generating plants to operate the SWP in 2011, excluding transmission losses.

Energy Generated

Table 10-2 shows the amounts of energy generated at SWP facilities in 2011, as well as energy purchased for SWP operations.

Hydroelectric and Coal

The Hyatt-Thermalito power complex in Oroville generated 2.21 million MWh of energy in 2011.

Energy generated at SWP aqueduct recovery plants—Gianelli, Alamo, Devil Canyon, Mojave Siphon, and Warne—totaled 1.79 million MWh.

The SWP share of energy generated at the coal-fired Reid Gardner Unit 4 in Nevada totaled 843,137 MWh.

Table 10-1 Energy Used at Pumping Plants and Power Plants in 2011, by Month (in megawatt-hours)

Pumping Plants and Power Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Hyatt-Thermalito Pumping-Generating Plant (station service)	39	5	16	0	1	1	0	0	0	1	204	6	273
North Bay Interim Pumping Plant	0	0	0	0	0	0	0	0	0	0	0	0	0
Cordelia Pumping Plant	176	343	127	131	899	1,068	1,338	1,366	1,309	1,038	1,104	942	9,841
Barker Slough Pumping Plant	68	137	51	110	605	880	1,190	1,227	1,321	887	817	573	7,866
South Bay Pumping Plant	939	7,158	4,016	5,394	10,070	10,669	13,257	13,672	13,183	10,307	2,716	226	91,610
DelValle Pumping Plant	28	25	29	27	23	18	16	18	17	22	30	29	284
Banks Pumping Plant	116,100	91,857	59,612	65,088	28,541	103,229	121,233	122,491	117,928	112,401	57,798	89,319	1,085,596
Gianelli Pumping-Generating Plant (SWP share)	65,811	25,285	13,052	276	0	13,124	3,716	3	10,542	34,718	9,888	26,653	203,068
Dos Amigos Pumping Plant (SWP share)	30,324	31,454	28,173	31,874	28,497	45,281	50,347	59,103	49,284	36,627	35,272	36,813	463,048
Buena Vista Pumping Plant	26,144	31,461	29,904	32,405	35,487	41,937	49,677	49,866	48,287	35,703	34,403	32,958	448,232
Teerink Pumping Plant	28,614	35,202	32,344	34,773	38,246	42,984	50,324	49,785	49,191	36,505	36,794	34,571	469,335
Chrisman Pumping Plant	63,757	77,960	71,530	75,899	82,269	92,016	108,050	108,380	107,415	79,732	81,752	76,702	1,025,463
Edmonston Pumping Plant	236,235	287,641	263,934	278,297	299,581	335,297	393,298	394,921	393,707	293,958	304,223	284,299	3,765,392
Alamo Powerplant (station service)	15	0	0	0	0	0	0	0	1	7	1	2	27
Pearblossom Pumping Plant	48,454	57,264	50,405	55,618	64,032	60,007	81,534	78,622	76,300	54,087	64,370	59,689	750,383
Pine Flat Powerplant (station service) ^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Mojave Siphon Powerplant (station service)	26	1	0	1	3	1	0	14	0	4	1	3	54
Devil Canyon Powerplant (station service)	0	0	0	0	0	0	0	0	1	1	45	0	47
Oso Pumping Plant	7,807	10,082	9,603	7,852	6,128	12,205	9,983	11,623	12,179	10,060	8,347	7,497	113,365
Warne Powerplant (station service)	211	79	104	137	192	10	56	3	0	53	114	209	1,167
Las Perillas Pumping Plant	270	249	225	727	1,065	1,399	1,671	1,424	1,011	776	96	329	9,240
Badger Hill Pumping Plant	703	649	584	1,862	2,756	3,457	4,113	3,535	2,555	2,007	225	846	23,291
Devil's Den Pumping Plant	1,304	1,164	1,039	1,409	1,787	1,869	2,076	2,082	1,874	1,566	502	939	17,610
Bluestone Pumping Plant	1,237	1,100	978	1,313	1,669	1,742	1,930	1,944	1,744	1,458	475	886	16,476
Polonio Pass Pumping Plant	1,316	1,181	1,053	1,443	1,822	1,880	2,086	2,087	1,869	1,569	507	958	17,770
Greenspot Pump Station	955	52	992	1,173	1,248	1,104	1,131	1,229	1,185	1,408	1,247	815	12,539
Crafton Hills Pump Station	1,233	16	1,340	1,496	1,544	1,498	1,494	1,528	1,495	1,886	1,689	1,039	16,259
Cherry Valley Pump Station	78	16	21	121	108	102	69	129	128	131	125	137	1,164
Total Energy Required for SWP	631,844	660,382	569,130	597,426	606,574	771,779	898,589	905,050	892,529	716,911	642,745	656,441	8,549,400

^a Pine Flat station service energy provided by CAISO under MRTU operation.

Table 10-2 Energy Generated and Purchased in 2011, by Month (in megawatt-hours)

Sources of Energy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
SWP Energy Sources													
Hyatt-Thermalito Powerplant	80,761	38,011	132,027	275,577	304,350	225,047	197,075	142,296	256,021	193,310	150,913	214,781	2,210,170
Gianelli Pumping-Generating Plant (SWP share)	0	0	174	865	35,285	8,201	9,287	14,962	90	0	4,786	0	73,651
Alamo Powerplant	6,525	8,316	8,493	9,248	9,507	9,700	9,824	9,688	8,579	8,366	8,840	8,344	105,430
Mojave Siphon Powerplant	6,011	7,044	5,730	6,223	6,877	6,357	8,723	7,538	8,071	5,396	7,466	6,590	82,025
Devil Canyon Powerplant	103,156	89,262	89,688	102,155	113,019	103,296	142,374	130,808	127,635	94,566	100,785	94,663	1,291,407
Reid Gardner Unit 4	0	70,798	10,468	0	81,568	101,807	124,418	106,891	109,203	94,811	64,628	78,545	843,137
Warne Powerplant	11,776	20,318	21,045	17,835	12,778	27,146	22,855	26,822	26,666	16,436	19,721	16,481	239,879
<i>Subtotal</i>	<i>208,230</i>	<i>233,750</i>	<i>267,627</i>	<i>411,903</i>	<i>563,384</i>	<i>481,553</i>	<i>514,556</i>	<i>439,004</i>	<i>536,265</i>	<i>412,884</i>	<i>357,139</i>	<i>419,406</i>	<i>4,845,699</i>
Energy Sources from Long-term Agreements													
Castaic Powerplant	29,165	39,069	36,065	30,330	20,798	44,116	39,553	44,449	43,142	31,209	28,272	26,218	412,388
Metropolitan Small Hydro Generation	8,168	9,927	8,272	12,267	14,723	17,062	16,729	15,234	12,226	12,592	8,491	11,006	146,698
Pine Flat Powerplant (Kings River Conservation Dist.)	41,707	18,088	41,935	121,579	119,400	126,062	141,358	110,860	48,694	25,806	0	0	795,488
Energy to Metropolitan for CRA ^a Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy from Metropolitan for CRA ^a	0	0	0	0	0	0	0	0	0	0	0	0	0
Purchases													
Purchases (Firm and Power Contracts)	197,800	285,600	420,300	326,400	247,800	221,200	306,000	204,000	248,000	238,600	372,725	370,813	3,439,238
CAISO Energy ^b	263,174	129,148	(89,294)	(232,252)	(259,531)	6,585	132,194	240,303	99,202	45,619	(93,881)	(139,802)	101,464
<i>Subtotal</i>	<i>540,015</i>	<i>481,832</i>	<i>417,278</i>	<i>258,323</i>	<i>143,190</i>	<i>415,026</i>	<i>635,834</i>	<i>614,846</i>	<i>451,264</i>	<i>353,827</i>	<i>315,607</i>	<i>268,235</i>	<i>4,895,276</i>
Total Resources	748,244	715,582	684,905	670,226	706,574	896,579	1,150,389	1,053,850	987,529	766,711	672,745	687,641	9,740,975
Less Energy Sales	(116,400)	(55,200)	(115,775)	(72,800)	(100,000)	(124,800)	(251,800)	(148,800)	(95,000)	(49,800)	(30,000)	(31,200)	(1,191,575)
Total Energy Provided to the SWP	631,844	660,382	569,130	597,426	606,574	771,779	898,589	905,050	892,529	716,911	642,745	656,441	8,549,400

^a Contractual Resource Arrangement.
^b Energy provided by CAISO for balancing the total SWP loads and resources.

Contractual Resource Arrangements

SWP power operations rely on contractual arrangements as well as SWP facilities. These contractual arrangements include joint development projects and energy purchases.

Joint Developments

Through the *West Branch Cooperative Development Agreement* with LADWP, DWR receives energy based on the amount of water scheduled through the West Branch. In 2011, LADWP provided 412,388 MWh for DWR's share of energy generated at Castaic Powerplant.

DWR's share of Gianelli Pumping-Generating Plant used 203,068 MWh and generated 73,651 MWh of energy.

Purchases and Costs

Table 10-3 shows amounts of energy, transmission, and other services purchased in 2011, and the costs of purchases. Amounts include contractual short-term and long-term purchases. They also include transactions of energy, transmission, capacity, and ancillary services with CAISO.

DWR purchased 4.40 million MWh of energy at a cost of \$135.19 million. Other SWP-related costs, including transmission, operation, maintenance, and CAISO charges totaled \$208.41 million. This amount includes \$4.37 million for debt service and \$4.70 million for operations and maintenance, both associated with Pine Flat Powerplant. It also includes \$2.08 million for transmission service from Reid Gardner Unit 4 to El Dorado Substation and \$57.24 million for operations, maintenance, fuel, insurance, waste removal, and property taxes at Reid Gardner Unit 4.

Long-term Purchase Agreements. According to terms of the Kings River Conservation District contract, DWR receives the total output of the 165 MW Pine Flat Powerplant.

In 2011, the power plant provided 795,487 MWh of energy to the SWP at an energy component cost of \$6.14 million.

Under the Metropolitan Small Hydro contract, DWR purchased 146,697 MWh of energy in 2011 from five small hydroelectric power plants on the Metropolitan system at a cost of \$8.36 million.

Short-term Purchase Agreements. Existing resources and long-term power and transmission contracts ensure that the SWP has enough power to meet long-term needs.

When SWP power requirements exceed resources during daily operations, short-term purchases make up the difference. In 2011, the SWP purchased 3.46 million MWh of short-term energy under the WSPP agreement from ten WSPP marketers and one public electric utility at a cost of \$120.69 million.

Contractual Sales of Excess Power

In 2011, DWR sold 1.19 million MWh of energy to one utility and seven WSPP power marketers for a total revenue of \$43.72 million. DWR also received \$84.00 million in revenues for capacity and other energy-related services, including \$81.47 million for transactions made through CAISO. See Table 10-4 for information about energy and other services sold and revenue received, including those sold to CAISO.

Forecasting Power Operations

Each year, after reviewing the SWP water contractors' water delivery requests and the construction schedule for future facilities, DWR forecasts the associated energy consumption and generation through 2035. Short-term power requirements, based on actual water supply and reservoir storage levels, are determined for the current and two ensuing years of operation. Long-term

Table 10-3 Energy, Transmission, and Related Costs in 2011

Category	Contractual Energy Purchased (MWh)	Energy Costs (in dollars)	Transmission Cost Outside CAISO (in dollars)	Other Energy-related Costs (in dollars)	Total Cost (in dollars)
CAISO				141,963,655 ^a	141,963,655
Long-term Contracts ^b	942,184	14,497,410	18,308,763	66,326,272	99,132,445
Energy Marketers (WSPP)	3,457,225	120,689,687		122,220	120,811,907
Total	4,399,409	135,187,097	18,308,763	208,412,147	361,908,007

^a Includes all costs under CAISO.

^b Kings River Conservation District, The Metropolitan Water District of Southern California, NV Energy, Pacific Gas & Electric Company, and Southern California Edison.

Table 10-4 Energy Sold in 2011 and Revenues from Sales per Contract Agreements

Category	Contractual Energy Sold (MWh)	Revenue from Energy Sales (in dollars)	Other Energy-related Revenue (in dollars)	Total Sales (in dollars)
CAISO			81,470,478 ^a	81,470,478
Long-term Contracts			2,530,656	2,530,656
Energy Marketers (WSPP)	1,192,114	43,715,619		43,715,619
Total	1,192,114	43,715,619	84,001,134	127,716,753

^a Includes all revenue under CAISO.

operational studies for the remaining years are based on median-year water supply conditions and optimal reservoir storage levels. The forecast also includes losses in reservoirs and aqueducts, recreation water, and water to replace storage in reservoirs south of the Delta.

Actual SWP power requirements may vary significantly from the forecast amounts. Those variations are due to the amount of water available and delivered in a given year. For example, dry conditions in Northern California could result in a reduction in the amount of water available for delivery and for generation. If full deliveries could not be made, less power would be used. Power requirements could also decrease during a wet year because of the availability of local water in the San Joaquin Valley or Southern California.

Conversely, power requirements could exceed the amount originally forecast if actual water deliveries are greater than

the amounts estimated. For example, if additional pumping is needed to refill reservoirs south of the Delta after an unexpectedly dry year, more power would be used.



Chapter 11

Facilities Maintenance

Lake Perris is the southernmost reservoir of the State Water Project.

Significant Events in 2011

The Patterson Dam Modifications (raise) under Specification No. 9-16 were approved by the Division of Safety of Dams (DSOD). Construction began in March 2011. The raise was completed in April 2011, and DSOD issued a Certificate of Approval with a new maximum water surface impoundment elevation of 711 feet on April 29, 2011.

The Cedar Springs Dam Replacement of Conduits and Miscellaneous Work project was completed in September 2011. Work consisted of replacing airshaft conduits, access ladders, and miscellaneous electrical work.

Frenchman and Grizzly Valley dams were inspected by Dam Safety Branch engineers and Oroville Field Division personnel following the October 26, 2011, magnitude 4.8 earthquake near Whitehawk, California. The inspections did not reveal any damage to the facilities.

A landslide shoreline inspection of Silverwood Lake was completed.

An Independent Consulting Review Board was held for Perris Dam.

Information for this chapter was provided by the Division of Operations and Maintenance, the Division of Safety of Dams, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.

The Department of Water Resources (DWR), through the Division of Operations and Maintenance (O&M), monitors all State Water Project (SWP) facilities to ensure safety and reliability. DWR is required, by federal and State law, to contract periodically with independent consultants to review the safety of SWP dams and power facilities.

Inspecting and Maintaining Project Dams

DWR conducts several types of inspections of SWP facilities to ensure that each dam is safe for continued operation. O&M staff collect and evaluate data regarding the performance of each facility. The Division of Safety of Dams (DSOD) has several programs to ensure the safety of SWP dams. DSOD engineers inspect SWP dams annually, on a fiscal year basis, to ensure they remain safe, are performing as intended, and are not developing problems. These annual inspections also include in-depth instrumentation review of dam surveillance data. Engineers from DSOD also evaluate proposed modifications to existing dams, as well as designs for any proposed new jurisdictional dams. DSOD also oversees construction activities to ensure work is performed in accordance with the approved plans and specifications. The Federal Energy Regulatory Commission (FERC) inspects all licensed SWP facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock, or power plant. In addition, under FERC and California Water Code requirements, consulting engineers and geologists are retained to evaluate SWP dam facilities every 5 years.

DWR contracts periodically with independent consultants to review the safety of SWP dams and power facilities, except for Pearblossom Spill Basin. Pearblossom Spill Basin Dam was originally designed to be used during misoperation at the Pearblossom Pumping Plant; the spill basin was never fully completed and has never been used.

Routine Inspections

During 2011, DSOD, along with O&M staff, inspected Antelope, Frenchman, and Grizzly Valley dams in the Upper Feather River area; Oroville, Bidwell Bar Saddle, Parish Camp Saddle, Thermalito Diversion, Thermalito Forebay, Thermalito Afterbay, and Feather River Fish Barrier dams in the Oroville Field Division; Bethany, Clifton Court Forebay, Del Valle, and Patterson dams in the Delta Field Division; and Castaic, Crafton Hills, Perris, and Pyramid dams in the Southern Field Division. Perris Dam was also inspected as part of the Director's Safety Review Board in 2011.

Cedar Springs and Devil Canyon Powerplant Second Afterbay dams, in the Southern Field Division, were inspected during calendar year 2010 and will be inspected in calendar year 2012 as a part of DSOD's fiscal year reporting cycle.

Joint-use Facility Inspection

The four dams in the San Luis Field Division (Sisk, O'Neill Forebay, Los Banos Detention, and Little Panoche Detention) are used jointly with the Bureau of Reclamation (Reclamation) and are not under DSOD jurisdiction. Every 6 years, Reclamation conducts a Comprehensive Facility Review (CFR) of the four joint-use facility dams in the San Luis Field Division. The CFR's for Los Banos and Little Panoche Detention dams occurred in February 2009. The CFR's for Sisk and O'Neill Forebay dams occurred in March 2009. Periodic Facility Reviews (PFRs) are also conducted by Reclamation every 6 years using an alternate schedule spaced between the CFR schedule. PFRs will be conducted for the joint-use facilities in 2012.

Independent Reviews

California Water Code Reviews

To comply with the California Water Code and the California Code of Regulations, DWR is required to retain a consulting board to review: (1) the adequacy of the design of any dam or reservoir DWR proposes to construct and (2) the safety of the completed construction, including the terms and conditions for the Certificate of Approval.

These provisions require DWR to retain a board of three consultants to meet at least once every 5 years to review the operational performance of DWR-owned dams and more frequently when consulting on new dams. The board of consultants independently reviews and assesses safety conditions of SWP dams.

Consultants are selected based on their knowledge of geotechnical, structural, and civil engineering, including their experience evaluating dam performance. Their independent assessments include the review of dam performance during earthquakes, evaluation of instrumentation data, inspection of each dam, and evaluation of studies performed by DWR. The consultants then prepare reports on each dam, approving dams as safe for continued operation and making recommendations. Based on these recommendations, DWR prepares action plans.

In 2011, an Independent Consulting Review Board was held for Perris Dam. The board found that Perris Dam is well operated and well maintained. The board recommended that the remedial construction under consideration by DWR to address foundation liquefaction be implemented as quickly as possible.

FERC Reviews

These reviews and the FERC Part 12D safety inspections, which may be conducted by one

or more consultants, are scheduled every 5 years. No Part 12D Boards occurred for SWP dams in 2011. As a supplement to the FERC Part 12D safety inspection, FERC's Dam Safety Performance Monitoring Program requires that a Potential Failure Mode Analysis be performed for FERC-licensed dams. The Potential Failure Mode Analysis involves document review and site visits to develop a comprehensive list of potential failure modes at each dam. From this review process, three documents are generated: the FERC Part 12D Safety Inspection report; the Potential Failure Mode Analysis report; and the Supporting Technical Information document, which summarizes the project elements and details that do not change significantly over time.

Arroyo Pasajero Program

The Arroyo Pasajero and its tributaries drain approximately 530 square miles of the Diablo Range of the coastal mountains west of the California Aqueduct in Fresno County. Its downstream juncture with the San Luis Canal segment of the California Aqueduct, between Highway 198 and Avenal Cutoff Road, poses a particularly difficult operational and maintenance problem for the SWP. Reclamation designed and constructed the San Luis Canal segment of the California Aqueduct, while DWR operates and maintains it, with all costs shared 45 percent and 55 percent, respectively.

During periods of heavy rainfall, high flows in the Arroyo Pasajero and its tributaries transport heavy sediment loads eroded from the Arroyo Pasajero watershed. Over a vast amount of time, sediment transported by arroyo floods formed a 450-square-mile alluvial fan extending from its apex at the eastern margin of Pleasant Valley (Anticline Ridge) to the San Joaquin Valley trough. The California Aqueduct traverses the arroyo's alluvial fan and forms a barrier to arroyo flood flows. Flood control facilities, designed to accommodate Arroyo Pasajero

floodwater, include the West Side Detention Basin (designed to store floodwater and sediment west of the California Aqueduct), an evacuation culvert to release floodwater east of the California Aqueduct, and drain inlets to release floodwater into the California Aqueduct.

Since the floods of 1969, when nearly all of the detention basin's planned 50-year sediment storage capacity was filled by deposition, DWR and Reclamation have worked to mitigate the effects of heavy flooding and the diminished storage capacity of the detention basin. In 1980, asbestos discovered in The Metropolitan Water District of Southern California's water supply was traced to runoff from the Arroyo Pasajero and other Diablo Range streams. This discovery, in conjunction with the high cost of removing sediment from the California Aqueduct, led DWR to adjust operating procedures to minimize runoff entering the California Aqueduct. The volume of runoff and sediment transported by the Arroyo Pasajero is roughly 400 percent greater than was originally estimated during the design of the detention basin in the mid-1960s.

DWR and DWR/Reclamation Alternative Long-term Solution

Construction to restore the storage capacity of the West Side Detention Basin started in August 2004, and many of the designed improvements were completed by the summer of 2005. These improvements restored the storage capacity to the detention basin and added control over releases of floodwater into the California Aqueduct and onto private farmland. The intended 50-year level of protection is achieved by raising levees, adding a control structure equipped with an inflatable rubber dam, installing flood gates, and acquiring flood easements. As of 2011, the basin's flood control features continued to function as expected.

One project component yet to be implemented is to armor the railroad embankment to reduce damages when it's overtopped by floodwater. DWR's agreement with the railroad expired at the end of 2009, before any progress toward armoring was made. A letter was sent to the railroad informing them that DWR believed the agreements should be renewed and the armoring project should move forward. The railroad did not respond to DWR's letter, and this component has been put on a permanent hold.

In 2009, DWR signed the certificate of acceptance for the deeds for the easements and lands acquired via litigation. The deeds were recorded, and the process to transfer the rights to Reclamation, as required by the joint-use agreement, was initiated. Part of the easement transfer process required that DWR obtain title reports that correctly show DWR's rights on the affected parcels. In 2010, DWR worked on correcting errors in the title reports and on the development of a legal description for a Consent to Common Use Agreement with Fresno County for a county-owned parcel. In 2011, the errors in the title reports were corrected and the Consent to Common Use Agreement with the county was executed. The transfer documents were completed and submitted to Reclamation for acceptance.

The West Side Detention Basin is an area of interest in the U.S. Environmental Protection Agency (EPA) Atlas Mine Area Operable Unit Record of Decision issued by the EPA in 1991. Five-year reviews of the Atlas Mine Area Operable Unit began in 2001, and have continued every 5 years since. In fall 2010, as a part of the upcoming 2011 review cycle, DWR toured the basin with representatives from the EPA and inspected all of the basin flood control features as well as soil berms, gates, locks, and signs used to deter soil disturbing activities. The EPA released its Five-Year Review Report in August 2011. The report contained various recommendations for DWR to take into consideration while operating the basin.

In September 2011, the California Department of Transportation informed DWR that it now had funding through Final Design on the Proposed Bridge Project at Lassen Avenue (State Route 269) over Arroyo Pasajero. DWR provided comments on the current Project Study Report in October 2011, which focused on flood control and the ongoing operation and maintenance needs of DWR's field division staff to properly maintain the channel.

Related Activities

Planning for a restoration project similar to the West Side Detention Basin restoration project began in 2006 for the Cantua Creek Stream Group detention basins. The project goal is to improve aqueduct flood protection and water quality.

A feasibility level study for the Cantua Creek Stream Group Improvement Project completed in April 2011, identified actions such as raising embankments, making modifications to structures, and acquiring flood easements to provide a 50-year level of protection for the California Aqueduct at the Cantua Creek Stream Group. Improving water quality in the aqueduct was a significant goal of the study, since currently, several of the existing drain inlets are not gated, and sediment-laden floodwater flows directly into the aqueduct with little detention and decanting. It is widely understood that increasing flood storage and detention of this floodwater prior to releasing it into the California Aqueduct would provide a significant benefit to water quality in the aqueduct. Later in April, a project kickoff meeting was held for DWR's Division of Engineering to begin the design phase of the selected alternative.

Repairs, Modifications, and Inspections

DWR continually monitors all SWP facilities and performs repairs, modifications, and inspections as necessary to ensure safe, reliable water delivery.

In 2011, Condition Assessment Program inspections were performed on more than 20 different reaches of the SWP for more than 214 miles of canals, pipelines, and tunnels. To aid in maintenance efforts, check structures, culverts, drain inlets, gauging stations, overchutes, water tanks, surge tanks, turn-ins, turnouts, and utility crossings along the canal were inspected and rated.

In the Oroville Field Division, features that were inspected included the Thermalito Power Canal, Richvale Canal, Western Canal, and Thermalito tailrace and their associated structures. Recreational facilities were also inspected including the Sewim Bo Trail; Lime Saddle, Spillway, Bidwell Canyon, Loafer Creek, and Enterprise area boat launches; the Oroville Dam; Bidwell Bar; and Lake Oroville Visitors Center.

In the Delta Field Division, features along 39 miles of the California Aqueduct were inspected. The Suisun Marsh Facilities that were inspected included the Suisun Marsh Salinity Control Gates, Roaring River Slough Distribution System, Morrow Island Distribution System, and the Goodyear Slough Outfall.

In the San Luis Field Division, features along 2 miles of the California Aqueduct were inspected.

In the San Joaquin Field Division, features along 69 miles of the California Aqueduct were inspected.

In the Southern Field Division, features along 102 miles of the West and East branches of the California Aqueduct were inspected, including the Santa Ana Pipeline.

Inspections are scheduled annually, biannually, or every 5 years. Future inspections will aim to identify trends in maintenance and aging of the SWP.

Outages for Maintenance and Repair of Facilities

Table 11-1 presents information, arranged chronologically, about significant scheduled and unscheduled outages at SWP pumping and power plants in 2011. The table includes information about incidents resulting in outages of 14 days or more.

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

Month	Facility	Unit	Outage Description
January	Banks Pumping Plant	3	January 12 to January 31 for discharge valve U/S seat leaking oil
	Banks Pumping Plant	4	January 1 to December 31 for unit rewind; continued from August 12, 2010
	South Bay Pumping Plant	1	January 1 to August 12 for loss of synchronization/excitation; continued from January 11, 2010
	South Bay Pumping Plant	3	January 1 to December 31 for motor removal; continued from August 25, 2010
	South Bay Pumping Plant	5	January 1 to February 16 for tripping on remote auxiliary start with 86M L/O and 50/51 B phase time over current relay action
	South Bay Pumping Plant	8	January 1 to January 24 for PT fuse problem
	Hyatt Powerplant	2	January 1 to December 31 for cover plate inspection and rotary strainer packing repair
	Hyatt Powerplant	4	January 1 to December 31 for pump mode incorrect assembly; continued from May 20, 2009
	Hyatt Powerplant	5	January 1 to March 28 for penstock outage; continued from October 21, 2010
	Hyatt Powerplant	6	January 1 to April 19 for turbine cover plate concerns; continued from November 29, 2009
	Thermalito Diversion Dam	1	January 6 to April 22 for air cooler cold water leak repair
	Robie Thermalito Pumping-Generating Plant	4	January 1 to December 31 for wear ring failure; continued from October 9, 2008
	Reid Gardner Powerplant	4	January 1 to February 5 for hydrogen manifold explosion
	Crafton Hills Pump Station	1	January 31 to March 3 for East Branch Extension Phase 1 work — Yucaipa connector
	Crafton Hills Pump Station	2	January 31 to March 3 for East Branch Extension Phase 1 work — Yucaipa connector
	Crafton Hills Pump Station	3	January 31 to March 3 for East Branch Extension Phase 1 work — Yucaipa connector
	Crafton Hills Pump Station	4	January 31 to March 3 for East Branch Extension Phase 1 work — Yucaipa connector
	Cherry Valley Pump Station	1	January 31 to April 13 for East Branch Extension Phase 1 work — Yucaipa connector
	Cherry Valley Pump Station	2	January 31 to March 29 for East Branch Extension Phase 1 work — Yucaipa connector
	Cherry Valley Pump Station	3	January 31 to March 29 for East Branch Extension Phase 1 work — Yucaipa connector

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

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Month	Facility	Unit	Outage Description
	Devil Canyon Powerplant	1	January 3 to January 27 for annual preventive maintenance
	Greenspot Pump Station	1	January 31 to March 3 for East Branch Extension Reach 3A
	Greenspot Pump Station	2	January 31 to March 3 for East Branch Extension Reach 3A
	Greenspot Pump Station	3	January 31 to March 3 for East Branch Extension Reach 3A
	Greenspot Pump Station	4	January 31 to March 3 for East Branch Extension Reach 3A
	Greenspot Pump Station	5	January 31 to March 3 for East Branch Extension Reach 3A
	Oso Pumping Plant	3	January 1 to May 9 for motor and impeller removal; continued from December 8, 2008
	Oso Pumping Plant	5	January 1 to December 31 for motor and impeller removal; continued from December 8, 2007
	Pearblossom Pumping Plant	6	January 1 to May 12 for annual Condition Assessment Program and rotor damage repair; continued from October 19, 2009
	Pearblossom Pumping Plant	9	January 10 to February 4 for mechanical seal and discharge valve O-ring replacement
	Warne Powerplant	2	January 1 to December 31 for needle replacement; continued from December 28, 2010
	Badger Hill Pumping Plant	1	January 12 to February 9 for incomplete start sequence
	Badger Hill Pumping Plant	2	January 14 to February 11 for failure to synchronize
	Badger Hill Pumping Plant	6	January 1 to May 23 for discharge valve failure to stay closed; continued from November 18, 2010
	Buena Vista Pumping Plant	2	January 1 to November 17 for stator rewind and complete overhaul; continued from June 14, 2010
	Devil's Den Pumping Plant	1	January 1 to May 17 for discharge valve repair and bypass line install; continued from July 28, 2010
	Edmonston Pumping Plant	2	January 17 to March 4 for replacing cold water, bypass, and balance lines
	Edmonston Pumping Plant	4	January 1 to May 2 for refurbishment and pump replacement; continued from October 1, 2009
	Edmonston Pumping Plant	8	January 1 to October 10 for Hitachi pump and motor refurbishment; continued from August 9, 2010
	Las Perillas Pumping Plant	6	January 1 to May 9 for neutral over current trip
	Chrisman Pumping Plant	1	January 1 to October 3 for scroll case regROUT; continued from November 15, 2010
	Chrisman Pumping Plant	2	January 1 to December 31 for pump and motor refurbishment; continued from July 26, 2010

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

Month	Facility	Unit	Outage Description
	Chrisman Pumping Plant	8	January 30 to February 19 for repairing leaking discharge valve seat
	Chrisman Pumping Plant	9	January 30 to February 19 for repairing leaking discharge valve seat
	Teerink Pumping Plant	6	January 1 to May 7 for casing repair and discharge valve removal
	Dos Amigos Pumping Plant	5	January 1 to March 24 for Biennial Condition Assessment Program; continued from September 20, 2010
	Giannelli Pumping-Generating Plant	5	January 1 to December 31 for trunnion coming out of butterfly valve
	Giannelli Pumping-Generating Plant	6	January 1 to February 2 for removing butterfly valve
	Giannelli Pumping-Generating Plant	7	January 1 to December 31 for O-ring leaking and turbine pit flooding
	Pine Flat Powerplant	3	January 18 to February 1 for scroll case/draft tube recoat
February	Banks Pumping Plant	2	February 17 to March 7 for discharge valve failure and sequencer repair
	Cordelia Pumping Plant	2	February 17 to November 17 for breaker explosion
	Mojave Siphon Powerplant	1	February 1 to March 14 for annual Condition Assessment Program
	Badger Hill Pumping Plant	2	February 14 to June 1 for inlet valve replacement
	Chrisman Pumping Plant	3	February 6 to March 1 for replacing KYA transformer 63R relay
	Chrisman Pumping Plant	9	February 19 to May 20 for failing A-phase winding high potential testing
	Dos Amigos Pumping Plant	1	February 9 to June 8 for trip and lockout on relay operation; babbitt found in oil and replacement of bearing
March	Barker Slough Pumping Plant	9	March 31 to April 28 for disconnect failure to close
	Cordelia Pumping Plant	2	March 1 to May 2 for pump and motor refurbishment
	Cordelia Pumping Plant	1	March 24 to April 18 for Breaker 132 trip testing
	Cordelia Pumping Plant	2	March 24 to April 18 for Breaker 132 trip testing
	Cordelia Pumping Plant	3	March 24 to April 18 for Breaker 132 trip testing
	Cordelia Pumping Plant	4	March 24 to April 18 for Breaker 132 trip testing
	Cordelia Pumping Plant	1	March 13 to April 18 for concrete encasement work for State Route 12 expansion
	Cordelia Pumping Plant	3	March 13 to April 18 for concrete encasement work for State Route 12 expansion
	Cordelia Pumping Plant	4	March 13 to April 18 for concrete encasement work for State Route 12 expansion
	South Bay Pumping Plant	8	March 21 to April 5 for trip on excitation

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

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Month	Facility	Unit	Outage Description
	Robie Thermalito Pumping-Generating Plant	1	March 17 to May 6 for noise coming from pit
	Devil Canyon Powerplant	2	March 7 to March 29 for annual Condition Assessment Program
	Oso Pumping Plant	4	March 16 to May 3 for unit 3 and 5 discharge valve work
	Oso Pumping Plant	6	March 16 to May 3 for unit 3 and 5 discharge valve work
	Pearblossom Pumping Plant	8	March 7 to March 29 for Condition Assessment Program and discharge valve repair
	Edmonston Pumping Plant	6	March 7 to May 13 for cooling water piping replacement
	Giannelli Pumping-Generating Plant	1	March 17 to August 23 headgate closed to reseal discharge valve #1
	Giannelli Pumping-Generating Plant	2	March 17 to August 23 headgate closed to reseal discharge valve #1
April	Banks Pumping Plant	11	April 28 to May 20 for failure to start due to loss of hydraulic pressure on the discharge valve
	Hyatt Powerplant	1	April 27 to June 30 for Condition Assessment Program and preventive maintenance
	Reid Gardner Powerplant	4	April 19 to May 10 for risk management
	Mojave Siphon Powerplant	2	April 4 to April 29 for annual Condition Assessment Program
	Devil's Den Pumping Plant	5	April 13 to July 14 for discharge valve failure to open
	Polonio Pass Pumping Plant	2	April 13 to May 2 for trip and lockout on relay operation and discharge valve emergency shutdown
	Polonio Pass Pumping Plant	6	April 29 to June 14 for failure to synchronize on start
	Dos Amigos Pumping Plant	3	April 6 to November 1 for exciter malfunction
May	Barker Slough Pumping Plant	1	May 1 to June 8 for failure to start
	Cordelia Pumping Plant	2	May 4 to August 2 for pump and motor refurbishment
	Hyatt Powerplant	3	May 24 to July 1 for penstock outage
	Pearblossom Pumping Plant	4	May 6 to August 26 for rotor inspection
	Pearblossom Pumping Plant	7	May 23 to June 15 for discharge valve seat repairs
	Pearblossom Pumping Plant	8	May 23 to June 15 for discharge valve seat repairs
	Pearblossom Pumping Plant	9	May 23 to June 15 for discharge valve seat repairs
	Polonio Pass Pumping Plant	4	May 31 to December 31 to inspect bearings
June	Banks Pumping Plant	1	June 6 to June 28 for trip and load test
	Barker Slough Pumping Plant	1	June 13 to July 7 for failure to start on remote auxiliary command
	Hyatt Powerplant	1	June 30 to July 21 for rotor repair

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

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Month	Facility	Unit	Outage Description
July	Devil's Den Pumping Plant	6	June 17 to July 19 for replacing outboard pump bearing
	Barker Slough Pumping Plant	3	July 8 to August 1 for unit trip while in service for unknown reason
	Hyatt Powerplant	5	July 25 to August 31 for penstock inspection and Western Electricity Coordinating Council line trip testing
August	Hyatt Powerplant	6	July 25 to August 31 for penstock inspection and Western Electricity Coordinating Council line trip testing
	Devil's Den Pumping Plant	4	July 20 to August 3 for bearing replacement
	Robie Thermalito Pumping-Generating Plant	3	August 1 to August 17 for bearing and slip ring replacement
	Mojave Siphon Powerplant	3	August 26 to September 22 for unit and governor Condition Assessment Program
September	Giannelli Pumping-Generating Plant	8	August 24 to December 31 for scroll case headcover weld repair
	Devil Canyon Powerplant	3	September 26 to October 14 for annual Condition Assessment Program
	Pearblossom Pumping Plant	5	September 12 to October 3 for annual Condition Assessment Program
October	Polonio Pass Pumping Plant	2	September 29 to December 13 for failure to synchronize during start
	Teerink Pumping Plant	1	September 6 to December 31 for pump and motor refurbishment
	Barker Slough Pumping Plant	1	October 17 to November 8 for failure to start on remote auxiliary command
	Thermalito Diversion Dam	1	October 7 to December 29 for exciter preventive maintenance
	Devil Canyon Powerplant	3	October 25 to November 11 for coupling chamber clean out
	Devil Canyon Powerplant	4	October 24 to November 22 for coupling chamber clean out
	Pearblossom Pumping Plant	1	October 10 to December 31 for Condition Assessment Program and discharge valve and pump case refurbishment
	Pearblossom Pumping Plant	9	October 24 to November 8 for switchyard outage for work on KYA, KYB, KYC, and KYD transformer work
	Devil's Den Pumping Plant	1	October 9 to November 19 for weed abatement
	Devil's Den Pumping Plant	2	October 12 to November 19 for failure to synchronize
Edmonston Pumping Plant	4	October 31 to December 31 for coating and repair on suction elbow	
Las Perillas Pumping Plant	5	October 7 to December 31 for motor refurbishment	
Polonio Pass Pumping Plant	6	October 9 to November 27 for failure to synchronize	
Pine Flat Powerplant	1	October 31 to December 31 for 230 KV switchyard preventive maintenance	

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

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Month	Facility	Unit	Outage Description
	Pine Flat Powerplant	2	October 31 to December 31 for 230 KV switchyard preventive maintenance
	Pine Flat Powerplant	3	October 31 to December 2 for 230 KV switchyard preventive maintenance
November	Banks Pumping Plant	9	November 3 to November 18 for trip test
	Cordelia Pumping Plant	2	November 18 to December 6 for discharge valve failure to open
	South Bay Pumping Plant	1	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	2	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	4	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	5	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	6	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	7	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	8	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	9	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	10	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	11	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	12	November 14 to December 31 for Surge Tank 2 retrofit
	South Bay Pumping Plant	13	November 14 to December 31 for Surge Tank 2 retrofit
	Badger Hill Pumping Plant	5	November 3 to November 18 for discharge line #2 inspection and repair
	Badger Hill Pumping Plant	6	November 3 to November 18 for discharge line #2 inspection and repair
	Bluestone Pumping Plant	1	November 6 to December 31 for annual outage discharge line
	Bluestone Pumping Plant	2	November 6 to December 31 for annual outage discharge line
	Buena Vista Pumping Plant	4	November 28 to December 31 for complete unit refurbishment
	Devil's Den Pumping Plant	5	November 2 to November 19 for failure to synchronize
	Edmonston Pumping Plant	12	November 7 to December 31 for pump and motor refurbishment
	Polonio Pass Pumping Plant	1	November 6 to November 20 for annual discharge line outage
	Polonio Pass Pumping Plant	3	November 6 to December 31 for annual discharge line outage
	Polonio Pass Pumping Plant	5	November 6 to November 20 for annual discharge line outage

Table 11-1 Outages for Maintenance and Repair of Facilities in 2011, by Month

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Month	Facility	Unit	Outage Description
	Polonio Pass Pumping Plant	6	November 27 to December 13 for failing to synchronize on start
	Dos Amigos Pumping Plant	2	November 7 to December 2 for Condition Assessment Program
December	Banks Pumping Plant	5	December 10 to December 31 for bulkhead work
	Cordelia Pumping Plant	2	December 6 to December 31 for unknown tripping
	Hyatt Powerplant	6	December 9 to December 31 for scroll case repair and reassembly
	Pine Flat Powerplant	2	December 15 to December 31 for turbine waterway recoating
	Pine Flat Powerplant	3	December 13 to December 31 for work on 13.8 KV transformer



Chapter 12

Engineering, Construction, and Real Estate

South Bay Pumping Plant, with its recently completed Stage 3 of the pumping plant enlargement project.

Significant Events in 2011

In 2011, engineering, construction, and real estate work to enhance, expand, repair, and protect the State Water Project (SWP) and other facilities within the State continued. Significant projects included the South Bay Aqueduct (SBA) enlargement, South Bay Pumping Plant expansion, Edmonston Pumping Plant refurbishment, Hyatt Powerplant pump-turbine refurbishment, and the East Branch Extension Phase I improvements and Phase II projects.

The Delta Habitat Conservation and Conveyance Program (DHCCP) continued with studies in 2011 to assess potential habitat restoration and water conveyance options.

Information for this chapter was provided by the Division of Engineering.

Initial construction of the State Water Project (SWP) facilities began in 1957 with the relocation of the Western Pacific Railroad facilities and Highway 70 near the City of Oroville to accommodate the SWP Oroville Facilities. Oroville Dam was constructed between 1961 and 1967. Construction of the South Bay Aqueduct (SBA) facilities started in 1960, and the first SWP water was delivered through the SBA in 1965 to serve Alameda and Santa Clara counties.

In 1963, work began on the California Aqueduct, and by 1968, the SWP was delivering water to long-term contractors in the San Joaquin Valley to the foot of the Tehachapi Mountains. By 1973, with the completion of Edmonston Pumping Plant at the foot of the Tehachapi Mountains and other East Branch conveyance facilities, the SWP was delivering water to Lake Perris at the southernmost point in Riverside County.

In 1974, SWP water was delivered to Los Angeles County through the West Branch facilities. SWP water was delivered to Napa County in 1968, through the first phase facilities of the North Bay Aqueduct (NBA), and to Solano County in 1988 by the second phase facilities. The first SWP water delivery through the Coastal Branch (Phase I) was made in 1968 to Kings and Kern counties.

Prior to the completion of the initial facilities in 1973, work began on the Upper Feather River facilities to supply local water, recreation, and fish enhancement. Power plants, additional pumping units, and turbine-generators that had been deferred during the initial construction of the SWP were built to ensure water quality and fish enhancement in the Delta.

From 1974 through 2011, design and construction activities shifted to repairing concrete lining failures or potential failures of the canal system and concrete pipeline sections; replacing equipment components of existing facilities; enlarging or extending aqueduct reaches; refurbishing pump-

turbine units and adding pumps and motors to existing facilities; constructing the Devil Canyon Second Afterbay; constructing Phase II of the Coastal Branch to deliver water to San Luis Obispo and Santa Barbara counties in August 1997; extending the SWP through the East Branch Extension to the San Geronio Pass service area in San Bernardino and Riverside counties; and assessing potential habitat restoration and water conveyance options in the Delta.

Design Activities

In 2011, work to enhance, expand, repair, and protect SWP water delivery facilities continued. Engineering activities supported more efficient water deliveries within the confines of legal constraints, environmental restraints, and power availability. Significant projects included SBA enlargement, South Bay Pumping Plant expansion, and feasibility studies for the East Branch Extension Phase I improvements and Phase II projects. Table 12-1 (at the end of the chapter) provides a list of completed and ongoing design work that was undertaken in 2011.

The Department of Water Resources (DWR) Division of Engineering (DOE) continued to design projects for development into the construction phase, including awarding construction contracts. DOE staff worked with many DWR divisions and offices, as well as local, State, and federal agencies. DOE staff prepared preliminary designs and estimates; developed and administered construction contract documents and carried

out construction projects; and conducted special studies of dams, canal embankments, and other SWP facilities.

Studies, reports, and activities continued from previous reporting periods, or initiated in 2011, included the following:

- fish screens at Sherman and Twitchell islands—final design;
- Frank’s Tract Pilot Project—design;
- NBA alternate intake—study;
- SBA Aqueduct Enlargement—69 kilovolt (kV) transmission line and Banks Switchyard—design;
- East Branch Enlargement, Phase II—preliminary design and environmental documents;
- Teerink, Chrisman, and Buena Vista pumping plants—furnish and install 230 kV SF6 power circuit breakers—design;
- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—replace septic tanks, sewage piping, and pumps—design;
- Perris Dam outlet tower—study;
- Perris Dam embankment remediation—design;
- Perris Dam emergency release extension—design;
- Sutter Bypass motor control center replacement—design;
- seismic loading criteria for SWP—study;
- early implementation program review—study; and
- emergency levee repair—Cache Creek Levee Mile 3.9 and Levee Mile 4.2 left bank—design.

In 2011, DOE staff completed the following studies and activities:

- seismic analysis of Enterprise Bridge—study;
- local bridge seismic safety program—design;
- Oroville Security Project—design;
- Oroville Operations and Maintenance Subcenter, garage shop—design;
- Freeman Bike Trail realignment—design;
- North-of-the-Delta Offstream Storage Investigation, Sites Reservoir Project, water conveyance facilities—study;
- Skinner Fish Facility research lab—design;
- Sisk Dam—seismic re-evaluation—study;
- replace heating ventilation and air conditioning systems, Gianelli Pumping-Generating Plant, San Luis Field Division—design;
- furnish Edmonston Pumping Plant pump and discharge valve spare parts—design;
- Pearblossom Pumping Plant, Administration Building—design;
- Check 66 trash rake improvement project—design;
- replace conduits and miscellaneous work, Cedar Springs Dam—design;
- East Branch Extension, Phase I improvements—study;
- East Branch Extension, Phase I improvements, Crafton Hills Reservoir Enlargement—design;
- East Branch Extension, Phase II—furnish American National Standards Institute (ANSI) ball valves—design;
- East Branch Extension, Phase II—furnish ANSI butterfly valves—design;
- East Branch Extension, Phase II—furnish American Water Works Association (AWWA)-standard butterfly valves—design;
- East Branch Extension, Phase II—furnish pumps, motors, variable frequency drives, and excitation systems—design;
- East Branch Extension, Phase II—furnish switchyard equipment, Citrus Pump Station—design;
- East Branch Extension, Phase II—furnish power transformers, Citrus Pump Station—design;

- Sutter Bypass—pumping plant control systems rehabilitation—design; and
- flood control improvements—Lower Butte Creek, Sutter Bypass, Weir No. 2 rehabilitation—design.

Environmental Activities

Since the inception of the SWP, environmental issues have increased in magnitude with the enactment of numerous federal and State laws. DWR has complied with these laws by incorporating environmental requirements and conditions into the design and construction phases of projects. A specific section dealing with environmental requirements and the protection of listed species has become an integral part of contract specifications for construction contracts. Contracts are reviewed to ensure compliance with requirements outlined in environmental permits for each contract. In 2011, projects requiring continuing environmental review are described below.

Delta Habitat Conservation and Conveyance Program

In 2008, as a result of calls by the Governor and Legislature to protect the Delta, the Delta Habitat Conservation and Conveyance Program (DHCCP) was established, prompting studies to assess potential habitat restoration and water conveyance options. The DHCCP is conducting an environmental review of the Bay Delta Conservation Plan (BDCP). The lead agencies preparing the joint draft environmental impact report/ environmental impact statement for the BDCP are DWR, Reclamation, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

DHCCP continued to:

- analyze BDCP proposed actions and alternatives through a formal environmental impact statement (EIS)/

environmental impact report (EIR) process;

- analyze options and consider areas of concern presented by the public during the EIS/EIR process; and
- develop engineering options for habitat restoration, other stressors, and water conveyance.

The environmental component of the DHCCP includes environmental impact analysis, California Environmental Quality Act and National Environmental Policy Act document preparation, environmental surveys, mitigation, and all associated permitting requirements. Approval of the BDCP, its EIS/EIR, and associated documents is essential to obtaining required permits.

In 2011, the DHCCP accomplished the following:

- completed field activities for the 2011 overwater geotechnical investigation;
- continued conventional soil testing and special laboratory testing and preparation of the DHCCP geotechnical data report;
- organized and/or participated in multiple stakeholder meetings;
- attended meetings with the Department of Transportation (Caltrans) and U.S. Army Corps of Engineers to discuss the intake configurations and possible impacts to levees and highways; and
- established a Chief Program Management Team consisting of DWR, water contractor, and Reclamation staff to develop a management strategy for the ongoing DHCCP engineering effort, and to provide coordination between the Engineering Team and the Environmental Team.

More information can be found on the BDCP website.

Construction Activities

DOE worked on 61 construction contracts in 2011. Projects included turbine and pump replacement, pipeline repair, trash rack upgrade at fish hatcheries, and recreational and maintenance facility improvements at dam and reservoir sites. Table 12-2 (at the end of the chapter) shows the following information for construction project contracts: construction division and facility, contract title, specification number, date the contractor received the Notice to Begin Work, the expected or actual acceptance date (physical completion date is discussed in narratives below), and the actual or estimated contract cost (including change orders for added work). Resolution of contract claims may extend the actual contract closeout beyond the completion or acceptance date.

SWP—General

SWP Control System

A contract (Specification No. 08-12) to replace portions of the aging SWP SCADA (supervisory control and data acquisition) system began in May 2009. This contract will furnish and install 176 controller assemblies for the replacement of remote terminal units located throughout the SWP and will furnish 16 controller assemblies for Devil Canyon Powerplant and DWR's development lab at the Joint Operations Center. The controller assemblies will be assembled from components furnished by the contractor (programmable logic controllers, sequence-of-event recorders, fiber patch panels, modems, and other equipment). Completion is scheduled for July 2013.

Communication Cable

Work began in July 2009 (Specification No. 09-02) to monitor, test, and repair approximately 450 miles of communication cable and appurtenances along the California Aqueduct. This contract, which also includes provisions for emergency repairs, as

directed, was completed in November 2011, and acceptance is expected in August 2012.

Oroville Division

Hyatt Powerplant

Refurbishment of turbine Units 1, 3, and 5 began in February 1999 (Specification No. 98-22) and was completed in May 2004. Refurbishment included manufacture, delivery, installation, and testing of new runners, wicket gates, bushings, and other components, and sandblasting, repairing, and coating water passages. The contractor continued working on its final contract submittals, including operations and maintenance manuals, into 2011. DWR accepted the contract in September 2011.

Refurbishment of pump-turbine Units 2, 4, and 6 started in November 2001 (Specification No. 01-11). All three units were commissioned by September 2007, but preparation and delivery of the final submittals continued through April 2009. Refurbishment included manufacture, delivery, installation, and testing of new runners, wicket gates, bushings, and other components, and sandblasting, repairing, and coating water passages. DWR accepted the contract in May 2011.

Oroville Operations and Maintenance Center

A new garage shop will be constructed and site work will be performed for a temporary building under a contract (Specification No. 11-03) that began in August 2011. This work is part of the Oroville Facilities Relicensing project.

Oroville Wildlife Area

A contract to construct ponds for wetland creation in the Oroville Wildlife Area began in August 2010 (Specification No. 10-07). Work included excavation of approximately 400,000 tons of aggregate from the dredger tailings, from which gravel will be separated

and stockpiled at the Feather River Fish Hatchery for later use as spawning gravel. Work was completed in November 2011, with contract acceptance expected in March 2012. A material offset for excavated material will reduce the net payments for this work.

Warehouse, Civil Maintenance Building, and Welding Shop Building

Roof replacement for the Warehouse, Civil Maintenance Building, and Welding Shop Building began in June 2008 and was completed in September 2008 (Specification No. 08-07). Added work at the Delta Operations and Maintenance Center (North San Joaquin Division) and at the Sacramento Maintenance Yard was accepted in September 2011.

North Bay Aqueduct

Napa Turnout Reservoir

Replacement of the Napa Turnout Reservoir (Specification No. 07-01) began in April 2007, and was completed in December 2011. Acceptance is expected in January 2012. The contract included replacing the existing tank with two 5-million gallon, steel covered tanks and installing piping and appurtenances. Acceptance will be extended, likely to January 2012, due to added corrosion monitoring equipment, a test station, and additional miscellaneous work at the valve vault.

Pipeline Reach N3B

Modifications to the Reach N3B pipeline, located approximately at Stations 157+00 to 158+50, 194+00 to 197+00, and 290+00 to 291+50, began in January 2011 (Specification No. 10-21) in preparation for Caltrans' State Route 12 widening project. Work included excavation and concrete encasement of the pipeline at all three sites, along with installation of a new segment of pipeline and appurtenances at the Station 290+00 to 291+50 site. The work was completed

in July 2011 and accepted in October 2011. The costs will be reimbursed 100 percent by Caltrans.

South Bay Aqueduct

Del Valle Branch Pipeline and Surge Tank

Due to a December 22, 2009, landslide on the hillside north of the Del Valle Branch Pipeline and surge tank, emergency repairs were made. Under a change order to Specification No. 08-14, the work included replacement of 373 feet of damaged 60-inch diameter prestressed concrete cylinder pipe with steel pipe, stabilization and repair of the hillside, removal and replacement of the existing surge tank foundation and valve vault, and encasement of approximately 385 feet of the existing prestressed concrete cylinder pipe. Repairs were completed in November 2010, and contract acceptance occurred in September 2011.

SBA Enlargement and Improvement

The SBA Enlargement and Improvement projects will restore the first 16.38 miles of the SBA to the 300 cubic feet per second (cfs) design flow and increase the design capacity by up to 130 cfs. This work will enlarge the South Bay Pumping Plant to accommodate four additional 45 cfs units, construct a third discharge line, construct Dyer Reservoir, enlarge the canal, and modify associated structures. Projects are described below.

Canal Modifications. Various modifications will be performed along Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline under a contract that began in October 2010 (Specification No. 09-16). Work includes raising the canal lining, canal embankment, and operating roads; removing, modifying, installing, or constructing various structures, including overchutes, inlets, pipes, bridges, trash racks, siphons, check structures, water level measurement systems, radial gates, motors, control systems, flowmeters, and valves; and

raising/refurbishing Patterson Reservoir. Completion is expected in July 2012.

Dyer Reservoir. In late July 2009, construction began on the new 500 acre-foot (af) (425 af of active storage) Dyer Reservoir (Specification No. 09-01). Contract features include the reservoir embankment, inlet and outlet structures, installation of steel pipe, road construction, and a turnout structure. Work is expected to be completed in the fall of 2012.

Siphon and Check Structure Modifications. Modifications to and replacements for siphon and check structures (Specification No. 08-14) began in September 2008, and completion occurred in March 2010. Work included construction of the concrete canal lining, check structures, new outlet and inlet transition structures, and operating roads; removal and reinstallation of an existing trash rack system; installation of a new turnout chamber, test stations, and cathodic protection; and removal of sediment and waste. Acceptance occurred in September 2011 after change order work was completed, which included:

- SBA, repair Santa Clara Pipeline;
- SBA, modify trash rack/rake system at Dyer-Altamont Check 2;
- SBA, repair Del Valle Branch Pipeline and surge tank;
- SBA, site work for wetlands at Dyer Reservoir; and
- NBA, emergency repair at Milepost 23.77 (Pipeline Reach N3B).

A contract (Specification No. 08-21) to fabricate 10 radial gates, radial gate hoist assemblies (with associated control systems), and electric actuators for SBA check structures began in January 2009 and was completed in June 2011. Also included in this contract are the fabrication of stop logs and stop log storage racks, one trash removal system for Dyer-Altamont Check

No. 2, and two trash removal systems for Del Valle Check No. 7.

Transmission Line and Modifications to Banks Switchyard. Construction of a new 69 kV transmission line from South Bay Pumping Plant to Banks Pumping Plant and modifications to the Banks Switchyard began in October 2009 (Specification No. 09-06). The new transmission line will increase the South Bay Pumping Plant power supply capacity and reliability while decreasing the unit cost of power. The Banks Switchyard modifications will allow a power step-down from 230 kV to 69 kV. Project work also includes installing of DWR-furnished transformers and equipment; furnishing and installing prefabricated control buildings, 13.8 kV distribution line poles and equipment, a new substation, and switchgear and equipment; and removing and disposing of existing 13.8 kV and 5 kV power distribution lines. Completion is expected in 2013.

South Bay Pumping Plant. The following contracts for the SBA Enlargement project at South Bay Pumping Plant continued throughout 2011:

- Specification No. 04-05: furnish 45 cfs pump and motor units for Unit Nos. 10 through 13 and one spare pump and motor. Work began in November 2004 and continued throughout 2011. Completion is expected in 2012.
- Specification No. 04-20: furnish valves, actuators, and hydraulic power units. Work began in May 2005. The equipment was furnished in June 2007. Repairs to the butterfly valves were added to this contract by change order; completion is expected in 2012.
- Specification No. 05-10: furnish switchyard equipment. Work began in September 2005 and is expected to be completed in 2012. Work added by a contract change order will furnish equipment for the Banks Switchyard

expansion to accommodate the new 69 kV transmission line from Banks Pumping Plant to South Bay Pumping Plant.

- Specification No. 05-05: furnish 5 kV switchgear. Work began in October 2005 and is expected to be completed in 2012.
- Specification No. 06-04: enlarge pumping plant initial facilities. Work began in August 2006 and is expected to be completed in 2012.
- Specification No. 07-02: furnish power transformers. Work began in April 2007 and was completed in September 2008. Acceptance is expected in 2012.
- Specification No. 07-18: added work included repairs to a water system pipeline adjacent to Banks Pumping Plant. Work began in December 2007 and is expected to be completed in mid-2012.

Surge Tanks

Work to seismically retrofit Surge Tank Nos. 1 and 2 (Specification No. 11-11) began in October 2011 and is expected to be completed in July 2012. Work included modifying existing footings to add post-tensioned rock anchors, replacing steel pipe and sleeve couplings, and adding steel cladding at the existing surge tanks. Additionally, reinstallation/replacement of cross connection piping, earthwork, electrical work, application of coatings, abatement of lead-based paint, and installation of miscellaneous metalwork such as grating, ladders, cages, handrails, and hatches were performed.

North San Joaquin Division

Delta Operations and Maintenance Center

Repairs to the Delta Operations and Maintenance Center roof began in August 2010 and were completed in February 2011. This work was performed under a change order to Specification No. 08-07.

Replacement of the existing 150-kilowatt standby engine generator with a new 500-kilowatt diesel engine generator and automatic transfer switch began in September 2008 under a change order to Specification No. 06-10. The existing generator was considered undersized and unable to provide reliable operation during an outage. Installation and startup of the generator and transfer switch could not be made until portions of the 69 kV transmission line contract were completed. Completion of the added work occurred in April 2011. Acceptance occurred in September 2011.

San Luis Division

Dos Amigos Pumping Plant

A contract (Specification No. 08-06) to design, manufacture, deliver, install, and test one complete automatic trash rake system and to manufacture, deliver, and install trash racks began in January 2009 and is expected to be completed in early 2012.

Gianelli Pumping-Generating Plant

Heating, ventilation, and air conditioning systems will be replaced under a contract (Specification No. 10-22) that began in April 2011. Completion is expected in June 2012.

Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Coalinga Operations and Maintenance Subcenter, Check Sites 9 through 21, and Flowmeters at Check Sites 12 and 21

A contract (Specification No. 06-10) to replace standby engine generators began in August 2006. The original work was completed in October 2009; the added change order work listed below was completed in July 2011. Acceptance occurred in September 2011. Added work included:

- furnishing and installing engine generators for the Delta Operations and

Maintenance Center, Banks Pumping Plant, the Feather River Fish Hatchery, and the Skinner Fish Facility;

- furnishing and installing a backup generator for University of California, Davis; and
- furnishing and installing an electrical panel at the Dos Amigos siphon house.

San Luis Canal

Due to subsidence that caused buckling and cracking in the canal lining, a contract to remove and replace damaged portions of the concrete lining along the California Aqueduct between Mileposts 56.40 and 164.90 began in November 2007 (Specification No. 07-20). Completion and acceptance is expected in November 2012. Added work includes:

- construction of a stability berm at Milepost 88.30;
- a dive survey and repairs at California Aqueduct Mileposts 89.02 and 138.96;
- Coastal Branch repairs (see Coastal Branch Reach 31A and Devil's Den Forebay sections in this chapter);
- Coastal Branch repairs between Mileposts 1.16 and 4.27; and
- repair of irrigation crossings at Mileposts 113.02R and 113.44L.

Two damaged steel irrigation pipes that cross the California Aqueduct at Mileposts 113.02 and 113.44 will be replaced by one high-density polyethylene pipe at Milepost 113.02 under a contract that began in September 2011 (Specification No. 11-09). Work includes directional drilling, repairs to the canal liner at the existing undercrossings, grouting, and abandonment of the existing pipes. Completion is expected in June 2012.

Tehachapi Division

Edmonston Pumping Plant

A contract to replace pump Units W2, W4, W6, and W8 (Specification No. 02-10) began in June 2003 and continued throughout 2011.

Completion is scheduled for March 2012, and acceptance is expected in May 2012. Work consisted of:

- designing, fabricating, and testing a four-stage pump model and a single-stage pump model, and furnishing a pump model test program report;
- designing, manufacturing, delivering, storing, and installing four pumps to replace existing pumps;
- furnishing spare parts, auxiliary equipment, tools, and templates;
- modifying existing pump foundations, if required, for the new pumps;
- applying coatings; and
- providing liaison services.

Under a contract (Specification No. 11-02) that began in June 2011, the contractor will furnish and deliver spare parts for the seven Baldwin-Lima-Hamilton pumps and discharge valves at Edmonston Pumping Plant. Spare parts include labyrinth seals, shaft seals, casing and impeller wear rings, shaft sleeves, wear plates, valve seal rings and pistons, and patch bolts. Work is expected to be completed in February 2013, and acceptance is expected in June 2013.

Mojave Division

Reaches 18A and 22B

Work began in July 2010 to seal and pave roads and parking areas in the Southern Field Division (Specification No. 10-03). Completion is expected in 2013. Added work included:

- sealing and paving roads on the California Aqueduct, West Branch, Reach 29G (Los Alamos Campground Access Road, Gorman Creek Siphon, Pyramid Lake Road, and Vaquero Campground parking lot) and
- asbestos abatement and/or testing at Buena Vista, Chrisman, and Teerink pumping plants.

Reach 20B

A minor contract (Specification No. 10-15) to repair the canal culvert at Milepost 344.38 began in August 2010 and was completed in November 2010. DWR accepted the contract in February 2011.

Cedar Springs Dam

A contract to replace conduits and perform miscellaneous work at Cedar Springs Dam began in March 2011 (Specification No. 10-06). Completion is expected in 2012.

Pearblossom Pumping Plant

A contract to construct a new 20,000 square-foot Pearblossom Administration Building near Pearblossom Pumping Plant began in February 2011 (Specification No. 10-23). The new building, which was designed and will be operated to attain the Leadership in Energy and Environmental Design gold rating, will be occupied by Southern Field Division staff and Lancaster Project Headquarters personnel. Completion is expected in July 2012.

Santa Ana Division

East Branch Extension Phase I

Construction of the East Branch Extension Phase I began with the issuance of a Notice to Begin Work on February 26, 1999, for pipeline Reaches 1 and 2. Phase I of the project is being constructed to convey 8,650 af of SWP water annually to the San Gorgonio Pass Water Agency service area, with provisions to provide San Bernardino Valley Municipal Water District deliveries to Yucaipa Valley. Located in San Bernardino and Riverside counties, the project facilities will consist of existing pipelines, three new pipeline reaches, three new pump stations, and a new reservoir. The official groundbreaking ceremony took place in Yucaipa on August 23, 1999.

Below are brief descriptions of the remaining construction contracts.

Greenspot, Crafton Hills, and Cherry Valley Pump Stations.

Work began in November 1999 on the contract (Specification No. 99-17) to design, manufacture, shop test, and deliver three 4,500 gallon per minute (gpm) and one 9,000 gpm vertical turbine pumps for Greenspot Pump Station; two 4,500 gpm and one 9,000 gpm vertical turbine pumps for Crafton Hills Pump Station; and two 3,600 gpm vertical turbine pumps for Cherry Valley Pump Station. The contract calls for electric motors, variable frequency drives, appurtenant equipment, and associated training programs. Completion of this contract was scheduled for December 2003 but was extended to March 2006 due to a change order for additional pump units and related components for Greenspot and Crafton Hills pump stations. Contract acceptance occurred in April 2011.

Work on a contract (Specification No. 06-21) to install spare units at Greenspot, Crafton Hills, and Cherry Valley pump stations, and to replace the existing control valves and unit discharge isolation valves for Greenspot Pump Station Unit Nos. 1 through 4 began in October 2006. Work was completed in April 2011 and accepted in December 2011. The work included:

- furnishing and installing a pump, motor, variable frequency drive, programmable logic controller cubicle, and motor control center unit breaker assembly at Cherry Valley Pump Station;
- furnishing and installing switchgear at Greenspot and Crafton Hills pump stations;
- installing programmable logic controllers, valves, piping, tubing, fittings, hangers, supports, and appurtenances at all three pump stations;
- installing DWR-furnished pumps and motors at Greenspot and Crafton Hills pump stations;

- installing a DWR-furnished variable frequency drive at Greenspot Pump Station;
- removing existing valves, piping, and appurtenances; and
- manufacturing and delivering tools and spare parts to all three pump stations.

Added work included modifying the switchgear to allow front access to the 5 kV bus and providing a flowmeter for Devil Canyon Second Afterbay.

East Branch Extension Phase I Improvements

The Phase I improvements will provide additional operational flexibility, system reliability, and will reduce on-peak energy demands.

Yucaipa Connector Pipeline. Fabrication and testing of 42-inch and 48-inch American Water Works Association (AWWA)-standard butterfly valves for the Yucaipa Connector Pipeline was performed under a contract (Specification No. 09-04) that began in August 2009. Completion occurred in June 2010, and acceptance occurred in August 2011.

Construction of the Yucaipa Connector Pipeline began in October 2010 (Specification No. 10-12) and is expected to be completed in 2012. The approximately one-half mile of 42-inch diameter steel pipe will allow continued deliveries of water via the East Branch Extension during enlargement of the Crafton Hills Reservoir and during future Crafton Hills Reservoir outages.

Crafton Hills Reservoir Enlargement.

A construction contract (Specification No. 11-12) to increase the reservoir's operating storage from 85 af to approximately 225 af began in December 2011 and is expected to be completed in May 2013. The work includes an earthen embankment dam with rock

slope protection, access roads, grouting, a seepage collection system, geotechnical instrumentation, and mechanical aerators.

East Branch Extension Phase II

Phase II of the East Branch Extension will complete the planned capacity increase for the East Branch Extension. Phase II will allow San Geronio Pass Water Agency to receive its maximum annual Table A water and allow the San Bernardino Valley Municipal Water District to increase its distribution system capacity to its Redlands and Yucaipa Valley service areas. Principal Phase II features include approximately 6 miles of new 72-inch and 66-inch diameter pipe, a new reservoir (Citrus Reservoir), a new 160 cfs pump station (Citrus Pump Station), expansion of the existing Crafton Hills Pump Station, and installation of an additional pump at Cherry Valley Pump Station.

Valves. Manufacturing, testing, and delivery of three energy dissipating valve assemblies (including electric actuators) for Citrus Reservoir began in September 2010 (Specification No. 10-10) and is expected to be completed in March 2013. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of fourteen ANSI (American National Standards Institute) butterfly valve assemblies with actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-16) and is expected to be completed in mid-2013. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of twelve AWWA butterfly valve assemblies with actuators for Crafton Hills Pump Station, Cherry Valley Pump Station, and Mentone Pipeline began in February 2011 (Specification No. 10-17) and is expected

to be completed in mid-2013. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of 12 ANSI ball valve assemblies with actuators and 4 actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-18) and is expected to be completed in July 2013. Spare parts and special tools are included in the contract work.

Transformers. Transformers, accessories, tools, and spare parts will be manufactured, tested, and delivered for Citrus Pump Station under a contract (Specification No. 10-20) that began in March 2011. The work is expected to be completed in August 2013.

Santa Ana Pipeline

Thirteen sections (Nos. 1859–1871) of the 108-inch inside diameter Santa Ana Pipeline will be repaired under a contract (Specification No. 11-07) to install a 102-inch outside diameter steel liner inside the existing pipeline. The sections are located under Burlington Northern Santa Fe railroad tracks in the city of Colton. The upper half of one additional section (No. 1858) will be removed to provide a launching cradle for the steel liner. After installation of the liner, Section No. 1858 will be removed and replaced with a steel section. Repairs began in August 2011 and are expected to be completed in January 2012.

West Branch

West Branch (Reach 29G) General

Under a change order to Specification No. 10-03, the following work began in July 2011 and is expected to be completed in April 2012:

- Los Alamos Campground Road: paving, striping, signage, shoulder repair, and drainage improvements;

- Gorman Creek Siphon: embankment erosion repair along the shoulder of Pyramid Lake Road; and
- Vaquero Parking Lot: parking lot refurbishment.

Oso Pumping Plant

Work began in December 2007 to construct a 14,400 square-foot civil maintenance and mobile equipment building at Oso Pumping Plant (Specification No. 07-22). Work is expected to be completed in 2012; however, required added work, including a water treatment facility, may delay occupancy until 2013.

Coastal Branch

Coastal Aqueduct Under State Route 46

Three sections of existing 57-inch inside diameter steel pipe along the Coastal Aqueduct (Reach 1) under State Route 46 were encased in concrete to allow Caltrans to widen the highway (Specification No. 10-01). Caltrans funded this work, which began in April 2010 and was completed in November 2010. DWR accepted the work in December 2011.

Construction Activities in Multiple Divisions

Delta Facilities, Suisun Marsh Facilities, and California Aqueduct

Work on a multiyear (2010 through 2012) contract to install and remove seasonal temporary rock barriers in designated South Delta waterways, provide temporary agricultural pumping facilities, place and remove flashboards at the Suisun Marsh Salinity Control Structure, dredge areas of the South Delta, and remove aquatic weeds in Clifton Court Forebay and other Delta waterways began in March 2010 (Specification No. 09-21) and is expected to be completed and accepted in December 2012. The temporary barriers are installed to enhance water levels

and circulation in the South Delta for local agricultural diversion, to assist fish migration, and to gather hydraulic data for the design of future permanent barriers. Added work includes:

- Delta Facilities: installation of a nonphysical barrier at Georgiana Slough;
- Delta Facilities: modifications to the fish release facility at Curtis Landing;
- Delta Facilities: removal of trees at Horseshoe Bend;
- Suisun Marsh Facilities: urgent repairs to the Roaring River Slough levee;
- North San Joaquin Division: repair cracks in the embankment of the California Aqueduct, vicinity of Milepost 88.96; and
- South San Joaquin Division: repair boil in the California Aqueduct, vicinity of Milepost 248.97, Reach 13B.

Banks Pumping Plant and Teerink Pumping Plant

A contract to furnish spare coils and materials for Banks and Teerink pumping plants (North San Joaquin and South San Joaquin divisions, respectively) began in February 2007 (Specification No. 06-27). The contract will be extended to furnish one set of spare coils for a 30,000 horsepower motor at Pearblossom Pumping Plant (Mojave Division). Completion is expected in August 2012.

San Luis and San Joaquin Field Divisions

Work began in August 2010 on a contract to seal and pave roads and parking areas at various locations in the San Luis and San Joaquin field divisions (Specification No. 10-02). Completion occurred in November 2010, and acceptance occurred in January 2011.

Buena Vista Pumping Plant and Chrisman Pumping Plant

Roofing repairs at Buena Vista and Chrisman pumping plants (South San Joaquin

Division) and at Warne Powerplant (West Branch) (Specification No. 10-19) began in October 2010 and are scheduled to be completed in 2012.

Miscellaneous Construction Activities

The following non-SWP construction activities are categorized as miscellaneous.

Emergency Levee Erosion Repairs

San Joaquin River Mile 71.5R. Due to vertical erosion of the river bank in the vicinity of River Mile 71.5R, DWR issued an emergency contract to place rock slope protection as necessary (Specification No. 11-01). Work began and was completed in January 2011, and acceptance followed in May 2011.

Erosion Repair and Bank Protection

Work began in October 2009 to repair levee erosion and protect the river banks along the San Joaquin River at River Miles 41.4L, 42.1R, 42.5R, and 42.8R (Specification No. 09-18). Work includes fencing; removal of trees, brush, debris, and a 6-inch pipe from the levee; protection of native trees; levee repairs and rock slope protection; installation of erosion control fabric; and planting, seeding, irrigation, and plant establishment. The contract was completed in July 2011 and accepted in September 2011.

Work began in September 2011 (Specification No. 11-06) to repair erosion along the San Joaquin River (River Mile 71.5R). The work includes fencing; protection of native trees; removal of trees, brush, and debris; earthwork; rock slope protection; installation of erosion control fabric; asphalt, concrete, and pavement repairs; planting, seeding, and irrigation; in-stream woody materials; and plant establishment. Completion is expected in November 2012.

Levee Road Repairs

Levee crown repairs at the San Joaquin River, Mariposa Bypass, and Eastside Bypass began and were completed in July 2011 (Specification No. 11-08). Contract acceptance occurred in September 2011.

Habitat Restoration

A contract to restore habitat (Specification No. 08-13) at the Colusa Sacramento River State Recreation Area began in October 2008 and is expected to be completed in 2012. This work to mitigate the Tisdale Bypass sediment removal project (Specification No. 07-14 [see Bulletin 132-09]) includes planting approximately 34,000 oak trees and other plants, as well as irrigation.

In October 2010, work began on a contract (Specification No. 10-14) to restore the Sycamore Creek habitat as a condition of the nationwide permit for the Sycamore Creek sediment removal project (Specification No. 10-13). The work, which is expected to be completed in July 2014, includes seeding, plantings, an irrigation system, signage, and monitoring of vegetation until the plants are established.

A contract (Specification No. 11-05) to restore habitat and public access at Jensen River Ranch (Phase III) began in September 2011 and is expected to be completed in March 2012. This phase of the work includes new decomposed granite pedestrian and horse trails, paving of an existing trail designed to accommodate users with limited mobility, wetland creation, new fencing and gates, a new irrigation system, and new corrugated metal pipe culverts to improve drainage.

Pumping Plant Control System Rehabilitation

Replacement of the motor control centers and the control systems at Sutter Bypass Pumping Plants Nos. 1 through 3 will be

performed under a contract that began in December 2010 (Specification No. 10-09). The contractor will remove and dispose of the existing control structures and will furnish and install new control structures, switchgear, nonsegregated busses, relays, SCADA systems, ground grids, and generators. Completion is expected in 2013.

Replacements

A contract (Specification No. 10-05) to replace the existing fish ladder structure and flow control structures at Willow Slough, Sutter Bypass, began in June 2010 and is expected to be completed in late 2012.

A project to replace Weir No. 2 in the East Borrow Canal in the Sutter Bypass began in April 2011 (Specification No. 10-08). The work includes a new weir structure and fish ladder approximately 100 feet downstream from the existing weir and a control building on the levee. Completion is expected in November 2013.

Sediment Removal

Work began in September 2010 to remove approximately 63,000 cubic yards of sediment from Sycamore Creek, Chico Creek, Mud Creek, and Sandy Gulch (Specification No. 10-13). The work was completed in November 2010 and was accepted in February 2011.

Real Estate Branch Activities

DWR processed a net total of \$3.8 million in payments in 2011 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. This amount represents direct payments made for the cost of real property rights, damages, temporary permits, licenses, leases, and relocation expenses.

DWR conducted the following real estate activities from January 1 through December 31, 2011.

SWP Acquisitions

Significant activities related to acquisitions were as follows:

- received authorization from the California Public Utilities Commission to construct a new grade-separated railroad undercrossing for the Brad B. Freeman Bike Trail in Oroville;
- processed a reimbursement payment to Conoco Phillips for \$120,660.70 for costs incurred through December 31, 2008, for the California Aqueduct Milepost 62 pipeline relocation project in Merced County;
- executed four weather station monitoring agreements on behalf of the Office of Water Use Efficiency, California Irrigation Management Information System program in Monterey, Orange, and Santa Barbara counties;
- met with Fresno County Department of Public Works and Planning staff to discuss project impacts to county roads for the Cantua Creek Stream Group Improvements project;
- executed a temporary construction agreement, processed a lost profits and severance damages agreement, and recorded a quitclaim deed and easement deed to correct discrepancies in road access rights for the Del Valle Pipeline Repair project;
- closed escrow on seven parcels for East Branch Extension, Phase I improvements project;
- filed condemnation deposit with State Treasurer for condemnation suit against Mentone Citrus for Parcel No. EBX-7 and closed escrow on six parcels as part of the East Branch Extension, Phase II project;
- executed a right-of-entry permit with San Bernardino Valley Water Conservation District for construction activities for Parcel Nos. EBX-4 and EBX-8 as part of the East Branch Extension, Phase II project;
- coordinated the relocation of three dwellings in the acquisition area of Parcel No. EBX-7 in conjunction with San Bernardino Valley Municipal Water District and its consultant, Overland, Pacific & Cutler, Inc., as part of the East Branch Extension, Phase II project;
- processed owner-initiated appraisal reimbursement agreements with San Bernardino County Flood Control District as part of the East Branch Extension, Phase II project;
- secured consent for five utility crossings of the Mentone Pipeline with Southern California Gas Company as part of the East Branch Extension, Phase II project;
- coordinated and attended biological and cultural resources site reviews on 110 Assessor's Parcel Numbers in Solano and Yolo counties for the NBA Alternate Intake Project;
- obtained a temporary occupancy permit from Burlington Northern Santa Fe Railway Company and certified right of way for Santa Ana Pipeline repairs;
- secured approval for construction access with San Bernardino County Flood Control District and the City of Colton for the Santa Ana Pipeline repairs;
- conducted a public outreach meeting in Livermore to inform the public of summer 2011 road closures required for the SBA Improvement and Enlargement project;
- received Department of General Services approval on an interagency agreement with the Department of Parks and Recreation allowing for a conservation easement on property around Bethany Reservoir as part of the SBA Improvement and Enlargement project;
- renewed two expiring temporary construction easement agreements for the SBA Improvement and Enlargement project;
- received Department of General Services approval for a memorandum of understanding executed with the Department of Fish and Wildlife covering

mitigation lands acquired in support of the SBA Improvement and Enlargement Project;

- recorded Director's easement deeds pursuant to the stipulation agreement reached by the Attorney General's Office and Altamont Infrastructure Company, LLC, and enXco Windfarm V, Inc. in support of the SBA Improvement and Enlargement project; and
- recorded a signed correction deed and grant deed from Tejon Ranch and processed associated payment to correct an error in the original legal description and reconcile closing costs for the Tehachapi East Afterbay project.

Temporary Permits

DWR obtained 117 temporary permits in support of SWP projects, including:

- Arroyo Pasajero, Phase II, 4;
- Doughty Cut flow monitoring station project, 7;
- East Branch Extension, Phase II project, 1;
- Georgiana Slough nonphysical barrier, 7;
- NBA Alternate Intake Project, 67;
- North Central Regional Office—South Delta monitoring stations, 1;
- North Central Regional Office—coordinated temporary entry permits, 5;
- Sacramento River channel improvements, 2;
- South Delta Improvements Program—predatory fish study, 2;
- South Delta Improvements Program—South Delta monitoring stations, 1;
- South Delta Improvements Program—temporary barriers, 3;
- South Delta Improvements Program—water seepage monitoring station, 3;
- South Delta ecosystem enhancement, 1;
- San Joaquin River restoration project, 11;
- SBA Milepost 39 repair, 1; and
- Walnut Grove water quality station, 1.

SWP Property Management

Property management activities during 2011 were as follows:

- managed leasing activities of SWP nonoperating properties, which produced an income of \$755,886;
- processed 25 encroachment permit applications and executed 22;
- collected fees of \$262,848 for review and inspection costs related to encroachment permit applications; and
- coordinated review of 19 tentative tract map developments within 1 mile of the California Aqueduct.

SWP Appraisals

The following appraisal activities were completed:

DWR completed 65 appraisals, 4 lease appraisals, and 2 appraisal reviews in 2011, including:

- East Branch Extension, Phase I project, two appraisals for permanent drainage easements;
- East Branch Extension, Phase II project, four appraisals;
- Delta Division, one appraisal for a grazing lease and one review for outside appraisal;
- Oroville Division, two appraisals for agriculture leases;
- BDCP, Reach I, 14 appraisals for multiple borings, access, and construction easements;
- BDCP, Reach II, 44 appraisals for various borings, access, and construction easements;
- Caltrans, State Route 99 widening project, one appraisal review;
- SBA, one appraisal for lease rate; and
- City of Palmdale, one appraisal of a drainage easement.

Table 12-1 Design Activities, January 1, 2011, through December 31, 2011, by Division

Division and Facility	Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
Oroville Division			
Enterprise Bridge	Seismic analysis	March 2009	March 2011
Oroville O&M Subcenter	Garage shop design	January 2010	June 2011
Oroville Field Division	Security project	October 2009	September 2011
Sites Reservoir	North-of-the-Delta Offstream Storage Investigation studies	December 2009	March 2011
Brad Freeman Bike Trail	Bike trail realignment—design	January 2009	May 2012
Delta Facilities			
Fish screens at Sherman and Twitchell islands	New fish screens at existing siphons—10 sites	September 2007	On Hold
Frank's Tract	Pilot project—design	November 2007	June 2012
North Bay Aqueduct			
North Bay Aqueduct	Alternate intake study	October 2008	December 2016
South Bay Aqueduct			
South Bay Aqueduct Enlargement	Furnish and install 69 kV transmission line and 13.8 kV distribution line and Banks switchyard modifications	October 2006	September 2012
North San Joaquin Division			
Skinner Fish Facility	Research lab design	September 2010	March 2011
San Luis Division			
Gianelli Pumping-Generating Plant	Replace heating ventilation and air conditioning systems	March 2009	April 2011
Sisk Dam	Seismic re-evaluation	July 2007	March 2011
South San Joaquin Division			
Teerink, Chrisman, and Buena Vista pumping plants	Furnish and install 230 kV SF6 power circuit breakers	October 2009	March 2012
Edmonston, Chrisman, Teerink, and Buena Vista pumping plants	Replace septic tanks, sewage piping, and pumps	August 2007	April 2012
Tehachapi Division			
Edmonston Pumping Plant	Furnish spare parts for pumps and discharge valves	January 2009	June 2011
East Branch Enlargement			
East Branch Enlargement, Phase II	Preliminary design and environmental documents	March 2007	On Hold
Check 66	Trash rake improvement project	May 2010	September 2011
Mojave Division			
Pearblossom Pumping Plant, Administration Building	Design new administration building	March 2008	February 2011
Cedar Springs Dam	Replacement of conduits and miscellaneous work	October 2008	February 2011

Table 12-1 Design Activities, January 1, 2011, through December 31, 2011, by Division

Division and Facility	Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
Santa Ana Division			
East Branch Extension, Phase I Improvements	Project planning and engineering feasibility studies for the Crafton Hills Reservoir enlargement	July 2007	February 2011
East Branch Extension, Phase II	Project planning and engineering feasibility studies	July 2008	September 2012
	Furnish ANSI ball valves	July 2008	January 2011
	Furnish ANSI butterfly valves	July 2008	January 2011
	Furnish AWWA butterfly valves	July 2008	February 2011
	Furnish pumps, motors, variable frequency drives, and excitation systems	July 2008	October 2011
	Furnish switchyard equipment, Citrus Pump Station	December 2003	November 2011
Perris Dam	Dam embankment remediation	January 2007	March 2013
	Emergency release extension	October 2006	December 2013
	Outlet tower study	January 2007	December 2012
Miscellaneous			
Sutter Bypass	Flood control improvements—Weir No. 2 rehabilitation	July 2006	April 2011
	Motor control center replacement	August 2008	December 2012
	Pumping plant control systems rehabilitation	August 2008	September 2012
State Water Project	Seismic loading criteria study	January 2010	June 2012
Early implementation program	Review	October 2008	June 2012
Local bridge seismic safety program	Design	October 2005	December 2011
Cache Creek Levee Mile 3.9 and Levee Mile 4.2	Emergency levee repair	January 2007	December 2012

Table 12-2 Construction Activities, January 1, 2011, through December 31, 2011, by Division

Sheet 1 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
State Water Project—General				
State Water Project Supervisory Control and Data Acquisition System	Replace remote terminal units (08-12)	May 2009	July 2013	11,500
Communication Cable	Monitor, test, and repair copper communication cable and voice and data equipment (09-02)	July 2009	August 2012	1,173
Oroville Division				
Hyatt Powerplant	Refurbish pump-turbine Units 1, 3, and 5 (98-22)	February 1999	September 2011	9,864
	Refurbish pump-turbine Units 2, 4, and 6 (01-11)	November 2001	May 2011	16,966
Oroville Operations and Maintenance Center	Build new garage shop and perform site work (11-03)	August 2011	May 2013	1,192
Oroville Wildlife Area	Construct ponds for wetland creation (10-07)	August 2010	March 2012	0
Warehouse, Civil Maintenance Building, and Welding Shop Building	Replace roofs (08-07)	June 2008	September 2011	497
North Bay Aqueduct				
Napa Turnout Reservoir	Replace reservoir (07-01)	April 2007	January 2012	11,281
Pipeline Reach N3B	Modify pipeline for State Route 12 widening (10-21)	January 2011	October 2011	1,452
South Bay Aqueduct				
Del Valle Branch Pipeline and Surge Tank	Repair pipeline at landslide (08-14 change order)	December 2009	September 2011	9,522
South Bay Aqueduct Enlargement and Improvement				
Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline	Perform canal modifications (09-16)	October 2010	July 2012	21,760
Dyer Reservoir	Construct Dyer Reservoir (09-01)	July 2009	December 2012	13,340
Siphon and Check Structure Modifications	Modify and replace siphons and check structures (08-14)	September 2008	September 2011	3,916
	Furnish check structure equipment (08-21)	January 2009	January 2012	3,300
Transmission Line and Modifications to Banks Switchyard	Construct 69 kV transmission line and modify Banks Switchyard (09-06)	October 2009	January 2013	8,460
South Bay Pumping Plant	Furnish 45 cfs pump and motor units and one spare pump and motor (04-05)	November 2004	June 2012	7,370
	Furnish valves, actuators, and hydraulic power unit (04-20)	May 2005	June 2012	2,258
	Furnish switchyard equipment (05-10)	September 2005	June 2012	1,496
	Furnish 5 kV switchgear (05-05)	October 2005	June 2012	3,571
	Construct pumping plant enlargement—initial facilities (06-04)	August 2006	June 2012	16,604

Table 12-2 Construction Activities, January 1, 2011, through December 31, 2011, by Division

Sheet 2 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
	Furnish power transformers (07-02)	April 2007	June 2012	4,666
	Complete pumping plant enlargement (07-18)	December 2007	May 2012	18,674
Surge Tanks	Seismically retrofit Surge Tank Nos. 1 and 2 (11-11)	October 2011	February 2013	3,919
North San Joaquin Division				
Delta Operations and Maintenance Center	Repair roof (08-07 change order)	August 2010	September 2011	40
	Generator replacement (06-10 change order)	September 2008	September 2011	208
San Luis Division				
Dos Amigos Pumping Plant	Replace trash rake system and trash racks (08-06)	January 2009	April 2012	3,407
Gianelli Pumping-Generating Plant	Replace heating, ventilation, and air conditioning system (10-22)	April 2011	March 2013	567
Gianelli Pumping-Generating Plant, Dos Amigos Pumping Plant, Coalinga Operations and Maintenance Subcenter, Check Sites, and Flowmeter Sites	Replace standby engine generators (06-10)	August 2006	September 2011	2,084
San Luis Canal	Repair canal lining, Mileposts 56.40 to 164.90 (07-20)	November 2007	November 2012	9,233
	Replace irrigation crossings, Milepost 113 (11-09)	September 2011	June 2012	242
Tehachapi Division				
Edmonston Pumping Plant	Replace pumps, Units W2, W4, W6, and W8 (02-10)	June 2003	May 2012	35,600
	Furnish and deliver spare parts (11-02)	June 2011	June 2013	5,159
Mojave Division				
California Aqueduct Reaches 18A and 22B	Seal and pave roads and parking areas (10-03)	July 2010	January 2013	3,149
California Aqueduct Reach 20B	Repair canal culvert at Milepost 344.38 (10-15)	August 2010	February 2011	257
Cedar Springs Dam	Replace conduits and perform miscellaneous work (10-06)	March 2011	July 2012	928
Pearblossom Pumping Plant	Construct 20,000 square-foot Leadership in Energy and Environmental Design gold-rated administration building (10-23)	February 2011	October 2012	11,506
Santa Ana Division				
East Branch Extension, Phase I				
Greenspot, Crafton Hills, and Cherry Valley Pump Stations	Furnish pumps, motors, and variable frequency drives (99-17)	November 1999	April 2011	4,657
	Furnish and install additional units (06-21)	October 2006	December 2011	4,062

Table 12-2 Construction Activities, January 1, 2011, through December 31, 2011, by Division

Sheet 3 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
East Branch Extension, Phase I Improvements				
Yucaipa Connector Pipeline	Furnish 42-inch and 48-inch AWWA valves (09-04)	August 2009	August 2011	233
	Construct 42-inch diameter pipeline (10-12)	October 2010	December 2012	2,842
Crafton Hills Reservoir Enlargement	Increase operating storage of the reservoir (11-12)	December 2011	August 2013	3,674
East Branch Extension, Phase II				
Valves				
	Manufacture, test, and deliver 3 energy dissipating valves for Citrus Reservoir (10-10)	September 2010	March 2013	700
	Manufacture, test, and deliver 14 ANSI butterfly valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-16)	January 2011	September 2013	1,147
	Manufacture, test, and deliver 12 AWWA butterfly valves for Crafton Hills and Cherry Valley pump stations and Mentone Pipeline (10-17)	February 2011	September 2013	162
	Manufacture, test, and deliver 12 ANSI ball valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-18)	January 2011	October 2013	2,748
Transformers				
	Manufacture, test, and deliver transformers and accessories for Citrus Pump Station (10-20)	March 2011	November 2013	556
Santa Ana Pipeline	Repair 13 sections of pipeline (11-07)	August 2011	July 2012	1,419
West Branch				
West Branch (Reach 29G) General	Construct road and embankment improvements (10-03 change order)	July 2011	January 2013	831
Oso Pumping Plant	Construct civil maintenance and mobile equipment building (07-22)	December 2007	December 2012	4,048
Coastal Branch				
Coastal Aqueduct under State Route 46	Encase existing steel pipeline (10-01)	April 2010	December 2011	1,770
Multiple Divisions				
Delta Facilities, Suisun Marsh Facilities, and California Aqueduct	Install and remove temporary rock barriers—2010 to 2012 (09-21)	March 2010	December 2012	18,331
Banks Pumping Plant and Teerink Pumping Plant	Furnish spare coils and materials (06-27)	February 2007	August 2012	2,551
San Luis and San Joaquin Field Divisions	Seal and pave roads and parking areas—2010 (10-02)	August 2010	January 2011	1,125
Buena Vista Pumping Plant and Chrisman Pumping Plant	Roofing repairs (10-19)	October 2010	January 2013	990
Miscellaneous Activities (Non-SWP)				
San Joaquin River Miles 41.4L, 42.1R, 42.5R, and 42.8R	Repair levee erosion and protect banks (09-18)	October 2009	September 2011	934

Table 12-2 Construction Activities, January 1, 2011, through December 31, 2011, by Division

Sheet 4 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
San Joaquin River Mile 71.5R	Emergency levee erosion repair (11-01)	January 2011	May 2011	880
	Repair levee erosion and protect banks (11-06)	September 2011	January 2013	3,343
San Joaquin River, Mariposa Bypass and Eastside Bypass	Repair levee crown roads (11-08)	July 2011	September 2011	697
Colusa Sacramento River State Recreation Area	Restore habitat (08-13)	October 2008	August 2012	942
Sycamore Creek	Restore habitat (10-14)	October 2010	October 2014	390
Jensen River Ranch (Phase III)	Restore habitat (11-05)	September 2011	May 2012	733
Sutter Bypass	Replace motor control centers and control system at Pumping Plant No. 1, Pumping Plant No. 2, and Pumping Plant No. 3 (10-09)	December 2010	February 2013	5,564
Sutter Bypass, Willow Slough	Replace existing fish ladder (10-05)	June 2010	March 2013	3,124
Sutter Bypass, East Borrow Canal	Replace Weir No. 2 (10-08)	April 2011	March 2014	4,365
Sycamore Creek, Chico Creek, Mud Creek, and Sandy Gulch	Remove sediment (10-13)	September 2010	February 2011	447



Chapter 13

Recreation

Every winter, Bald Eagles are a popular attraction at Silverwood Lake State Recreation Area.

Significant Events in 2011

The new concessionaire, Parks Management Company, began managing the recreation facilities at Pyramid Lake Recreation Area on January 1, 2011. Along with facility improvements, the result was a nearly 16 percent increase in visitor attendance over 2010.

This year's "Catch A Special Thrill" (C.A.S.T.) fishing events, in partnership with the C.A.S.T. for Kids Foundation fishing program, were the subject of two major media shows. The event at Lake del Valle was reported on a KGO Radio program, "Spotlight 810," and the event at Lake Perris was featured on the *Funky Fishing Show*. These programs detailed the work that the Department of Water Resources (DWR) is doing for disabled and disadvantaged youth throughout California.

DWR contracted with the California Department of Parks and Recreation (California State Parks) and the Los Angeles County Department of Parks and Recreation to implement vessel inspections and outreach at San Luis Reservoir, O'Neill Forebay, Los Banos Reservoir, Pyramid Lake, and Castaic Lake. These reservoirs were assessed to be at high risk for quagga and zebra mussel infestations.

Information for this chapter was provided by the Division of Integrated Regional Water Management, Public Affairs Office, Division of Environmental Services, and the State Water Project Analysis Office.

The State Water Project (SWP) is a multipurpose project that provides recreational benefits to millions of Californians. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP offers extensive and varied recreational opportunities—tours, sightseeing, fishing, hunting, picnicking, camping, boating, water skiing, bicycling, hiking, and swimming. Under the Davis-Dolwig Act (DDA), these recreational opportunities, as well as fish and wildlife enhancements, are not allocable as water and power costs to the SWP water contractors. They are financed by Department of Water Resources' (DWR) existing authorities under the Burns-Porter Act and appropriations from the Legislature specifically for these purposes.

Recreation Areas

The SWP has 37 developed recreation areas, or sites, throughout California, including 18 developed fishing access sites. Figure 13-1 shows the name and location of each area.

Recreation Use

In 2011, SWP facilities supported an estimated 4.1 million recreation days of use (Table 13-1), down somewhat from the 4.3 million reported in 2010, and 4.2 million reported in 2009. A recreation day is defined as one individual user visiting a recreation site along the SWP within all or part of a 1-day period.

Attendance was mixed at SWP reservoirs. The largest increase in 2011 occurred at Pyramid Lake with a 15.9 percent increase in visitor attendance. This was likely due to a combination of the facility improvements that DWR performed, and the marketing of the concessionaire that started at the beginning of 2011. The Vista del Lago Visitors Center also saw a 5.4 percent increase in their annual attendance.

Lake Oroville and Thermalito Forebay experienced a 7.7 percent increase in attendance, and Lake del Valle also had an 11.1 percent increase, despite having campground closures for 6 months.

Frenchman Lake was estimated to have had a 4.9 percent decrease in attendance.

Lake Davis had a 35.8 percent decrease in attendance. There was a closure of the Grasshopper Flat and Grizzly campgrounds due to a summer-long tree health and safety thinning operation at these locations that might have contributed to the decrease in attendance.

Lake Perris experienced a 6.8 percent decrease in attendance, most likely due to the continued low water levels implemented and maintained as a result of Perris Dam safety concerns.

Most SWP recreation use is concentrated at the major reservoirs, with 38 percent occurring at the lakes in the Oroville Field Division and 43 percent of the total SWP recreational use in 2011 occurring at the four major reservoirs in Southern California: Pyramid Lake, Castaic Lake, Silverwood Lake, and Lake Perris.

After re-evaluating the total recreation days since the SWP began delivering water in 1962, it was determined that SWP recreation has contributed to more than 227 million recreation days, approximately 7 percent higher than reported in prior bulletins.



Figure 13-1 Names and Locations of SWP Recreation Areas

Table 13-1 Estimated Recreation Days in 2011, by Field Division and Facility

Field Division and Facility	Number of Recreation Days (rounded)
Oroville Field Division	
Frenchman Lake	58,300
Antelope Lake	29,400
Lake Davis	24,600
Lake Oroville and Thermalito Forebay	907,900
Thermalito Afterbay and Oroville Wildlife Area	271,100
Feather River Fish Hatchery	175,900
Lake Oroville Visitors Center	94,600
<i>Subtotal</i>	<i>1,561,800</i>
Delta Field Division	
Lake del Valle	388,300 e(1)
Bethany Reservoir	2,500 e(2)
Fishing Access Site:	
Niels Hansen	300 e
California Aqueduct:	
Walk-in Fishing	800 e
Bikeway	300 e
White Slough Wildlife Area	12,000 e
<i>Subtotal</i>	<i>404,200</i>
San Luis Field Division	
San Luis Reservoir SRA: San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	189,200
Romero Overlook Visitors Center	135,400
California Aqueduct:	
Walk-in Fishing	200 e(3)
Wildlife Areas	1,700 e(3)
<i>Subtotal</i>	<i>326,500</i>
San Joaquin Field Division	
Fishing Access Sites: Kettleman City, Lost Hills, Buttonwillow, and California Aqueduct	
Walk-in Fishing	25,700 e
<i>Subtotal</i>	<i>25,700</i>
Southern Field Division	
Silverwood Lake	260,100 e(4)
Lake Perris	567,800 e(4)
Vista del Lago Visitors Center	155,900
Pyramid Lake	123,500
Castaic Lake and Castaic Lagoon	649,800
Fishing Access Sites:	
Quail Lake	1,700 e
77th Street East	700 e
Longview Road	100 e
California Aqueduct:	
Walk-in Fishing	1,700 e
Bikeway	2,100 e
<i>Subtotal</i>	<i>1,763,400</i>
Total for Recreational Sites	3,695,700
Total for Visitors Centers	385,900
Grand Total	4,081,600

Note: these values are provided by facility operators and numerous other sources, and vary in their degree of accuracy. Recreation days are based on counts, except where marked "e," which are based on partial data; e(1) data were affected by campground closures for 6 months of the year and short-staffing; e(2) is based on data that are counted by California State Parks Thursday through Sunday only; e(3) fishing access on or adjacent to the dams has been eliminated due to security concerns resulting in a significant decrease in attendance in the general area; e(4) starting in 2011, all Southern Field Division locations are reporting attendance on a calendar-year basis.

Visitation at DWR's three SWP educational visitor centers totaled:

- Lake Oroville Visitors Center, 94,600 recreation days;
- Romero Overlook Visitors Center, San Luis Reservoir, 135,400 recreation days; and
- Vista del Lago Visitors Center, Pyramid Lake, 155,900 recreation days.

Overall, recreation usage of 4.1 million recreation days at the SWP facilities listed in Table 13-1 contributed to the more than 67.9 million day-use visitors at the 279 units of the California State Park System in fiscal year 2011–2012.

Facilities

In 2011, the following activities occurred or were planned for SWP facilities.

Planning

Antelope Lake Recreation Area

DWR began obtaining estimates to make improvements to the shoreline trail along the peninsula at Long Point Campground, which was originally designed to accommodate users with limited mobility. The trail no longer accommodates these users.

Lake Oroville State Recreation Area

The California Department of Parks and Recreation (California State Parks) made the following plans in 2011 for future improvements to the facilities at Lake Oroville State Recreation Area:

- build a North Fork Trail extension, to be funded by a Recreational Trails Program grant;
- build two environmental equestrian campsites that will be built by California State Parks and funded by DWR and the Recreational Trails Program grant;
- install LED lighting at Lake Oroville Visitors Center;

- install energy efficient lighting at the Lake Oroville Marina parking lot and in all Lake Oroville campgrounds to reduce expenses;
- install a new sewage treatment plant at Lake Oroville Marina;
- rebuild the benches at Loafer Creek campfire center; and
- replace the decking on the Bidwell Bar Bridge.

Lake del Valle State Recreation Area

East Bay Regional Park District is preparing to replace a campground restroom with a new restroom, funded partially by park entrance fees.

Pyramid Lake Recreation Area

Parks Management Company is considering installing shower facilities at the Pyramid Lake Los Alamos Campground. These facilities would be movable buildings with coin-operated showers. In addition, it is considering a boat rental facility and a water play park at Vaquero Beach that would utilize inflatable and semi-rigid floating structures such as trampolines and obstacle courses.

New Facilities

During 2011, new facilities were completed at the following sites.

Lake Oroville State Recreation Area

California State Parks performed a significant amount of trail improvements at Lake Oroville State Recreation Area during 2011.

California State Parks installed 167 trail mileage markers every half-mile along the entire trail system, which was funded by DWR. The markers were installed to both increase safety and decrease response time by emergency personnel along the trail system.

The Rattlesnake Hill Trail was redesigned to accommodate users with limited mobility. This work was designed and performed by California State Parks and funded by an Environmental Enhancement and Mitigation Program grant.

In addition, an unpaved trail at the spillway was paved, making it accessible to users with limited mobility.

California State Parks installed new barrier cables around the perimeter of the Nelson Bar parking area, installed fencing at Ponderosa Dam to discourage unauthorized off-road use, and, along with DWR, purchased a new sewage pump boat to service the 6 floating restrooms and 10 floating campsites.

Lake del Valle State Recreation Area

East Bay Regional Park District installed electrical hookups at 21 existing campground RV sites at the Del Valle Campground. It also replaced Del Valle Building 8 with a new restroom.

The Division of Boating and Waterways installed a new west-side boat dock and gangway to accommodate users with limited mobility. Electrical power was also provided to the quagga and zebra mussel inspection trailer.

San Luis, Pyramid, and Castaic Lake State Recreation Areas

DWR contracted with California State Parks and the Los Angeles County Department of Parks and Recreation to implement vessel inspections and outreach at San Luis Reservoir, O'Neill Forebay, Los Banos Reservoir, Pyramid Lake, and Castaic Lake. These reservoirs were assessed to be at high risk for quagga and zebra mussel infestations, based upon habitat suitability, and were not covered by any existing inspection program. These contracts are limited to a 3-year term. The inspection

methods were replicated from methods used at Silverwood Lake and Lake Perris, and inspection bands are being accepted from other inspection programs.

DWR routinely monitors SWP reservoirs and the Sacramento-San Joaquin Delta for the presence of quagga and zebra mussels. For more information, see Chapter 3, Environmental Programs.

Silverwood Lake State Recreation Area

California State Parks completed construction of a dreissenid mussel vessel inspection station, including installation of a modular kiosk for staff operations, and a five-lane, fence-secured area with a concrete surface for vessel inspections.

Improvements to Facilities

During 2011, improvements were made at the following facilities.

Frenchman Lake Recreation Area

The U.S. Forest Service began construction of a shoreline access trail at the Frenchman Dam area and installed showers at the Big Cove Campground.

Lake del Valle State Recreation Area

East Bay Regional Park District performed the following improvements specifically to accommodate users with limited mobility:

- demolished the old boat house on the west side and installed a picnic site;
- completed a campfire ring conversion for 150 sites;
- converted Wild Turkey Group Camp into a camp to accommodate users with limited mobility;
- replaced water fountains at Arroyo Road Staging Area and the Amphitheater with high/low drinking fountains;
- installed new asphalt pathways on the west side from the parking lot to the

visitors center and the new west boat dock; and

- replaced two side walls at the east concession area.

Pyramid Lake Recreation Area

Parks Management Company began managing the recreation facilities at Pyramid Lake Recreation Area on January 1, 2011. This allowed facilities such as Vaquero Beach to be open 7 days a week for the first time in 5 years, and a campground reservation system was initiated.

The following improvements were made in 2011.

Restroom Repairs. All five septic systems were repaired and cleaned out. Most of the restrooms had electrical issues that were repaired, and new hardware and paint were added.

Emigrant Landing Day Use Area. The electrical infrastructure was completely overhauled. Both gate houses were revamped and were made operational for the 2011 summer season. All parking lots and roadways were replaced or slurry coated; stairways from the upper to lower parking areas were replaced; and a new fishing area, which included ramps, walkways, tables, and railings to provide for public safety and to accommodate access for users with limited mobility, was installed.

A 60 foot by 14 foot building was installed at Emigrant Landing to be used as a general store for visitors. It will carry food, nonalcoholic drinks, camping gear, fishing tackle, and boating equipment.

DWR assisted with the clean-up of a boat storage facility at Emigrant Landing for use by approximately 45 trailers. The facility opened on Independence Day weekend.

Water Infrastructure. Dozens of leaks and broken pipes were identified and repaired.

Tree Planting Project. Parks Management Company planted more than 100 trees throughout the Los Alamos Campground near Pyramid Lake. In addition, irrigation pipe was laid around every tree.

Signage. Nearly every sign around Pyramid Lake is being replaced, including road signs and highway markers. This project is expected to be completed by Memorial Day, 2012.

Fire Rings and Barbeques. To accommodate access for users with limited mobility, 60 fire rings are being replaced with modern fire rings in campgrounds (Emigrant Landing, Vaquero Beach, and Spanish Point). The project is expected to be completed by Memorial Day, 2012.

Silverwood Lake State Recreation Area

California State Parks replaced 700 feet of paved bicycle trail near Cleghorn Day Use Area.

The Division of Boating and Waterways finished improvements to the Live Oak Boat-In Site. The project consisted of demolition and removal of six existing shade ramadas and the installation of eight new shade ramadas, eight picnic tables, eight trash bins, eight concrete pads, and one project sign that was located near the existing restroom. Some minor grading work was performed. The improved facilities were designed to accommodate users with limited mobility. The total cost was \$141,000.

Lake Perris State Recreation Area

California State Parks removed a 6,000 gallon steel fuel storage tank from the marina parking lot, along with 100 feet of buried fuel supply line and associated electronic systems.

Recreation Activities

The SWP, with its many reservoirs and hundreds of miles of aqueducts, offers Californians many recreational opportunities. From Antelope Lake in Northern California to Lake Perris in Southern California, the SWP includes facilities for anglers, boaters, campers, hikers, cyclists, and many others. While DWR manages the routing of water through the reservoirs, the recreational facilities are operated variously by federal, State, and local agencies and, in many cases, their private concessionaires. Visitors to SWP facilities can swim, water ski, and picnic, as well as enjoy other activities. See Figure 13-2 for the various types of recreation available along the SWP.

Lake Oroville State Recreation Area

DWR, California State Parks, and their many other agencies sponsored the following activities in 2011:

- DWR co-hosted a Jack Splash Fit-N-Fun Day with the Oroville YMCA at the North Forebay, near the Aquatic Center. Two hundred fifty children came to learn the value of exercise and healthy eating habits through various activities with staff.
- DWR and California State Parks helped support, through a contract with the Oroville Chamber of Commerce, the annual Oroville Salmon Festival. This 2-day fall event was held at the Feather River Fish Hatchery and downtown Oroville, and was attended by an estimated 8,000 participants.
- DWR co-hosted a 2-week Aquatic Adventure Camp program with the Feather River Recreation and Park District and the Chico Area Recreation District, for 26 local children. They were educated in sailing, canoeing, sail boarding, proper use of safety equipment, water safety, and rescue techniques by Forebay Aquatic Center staff.

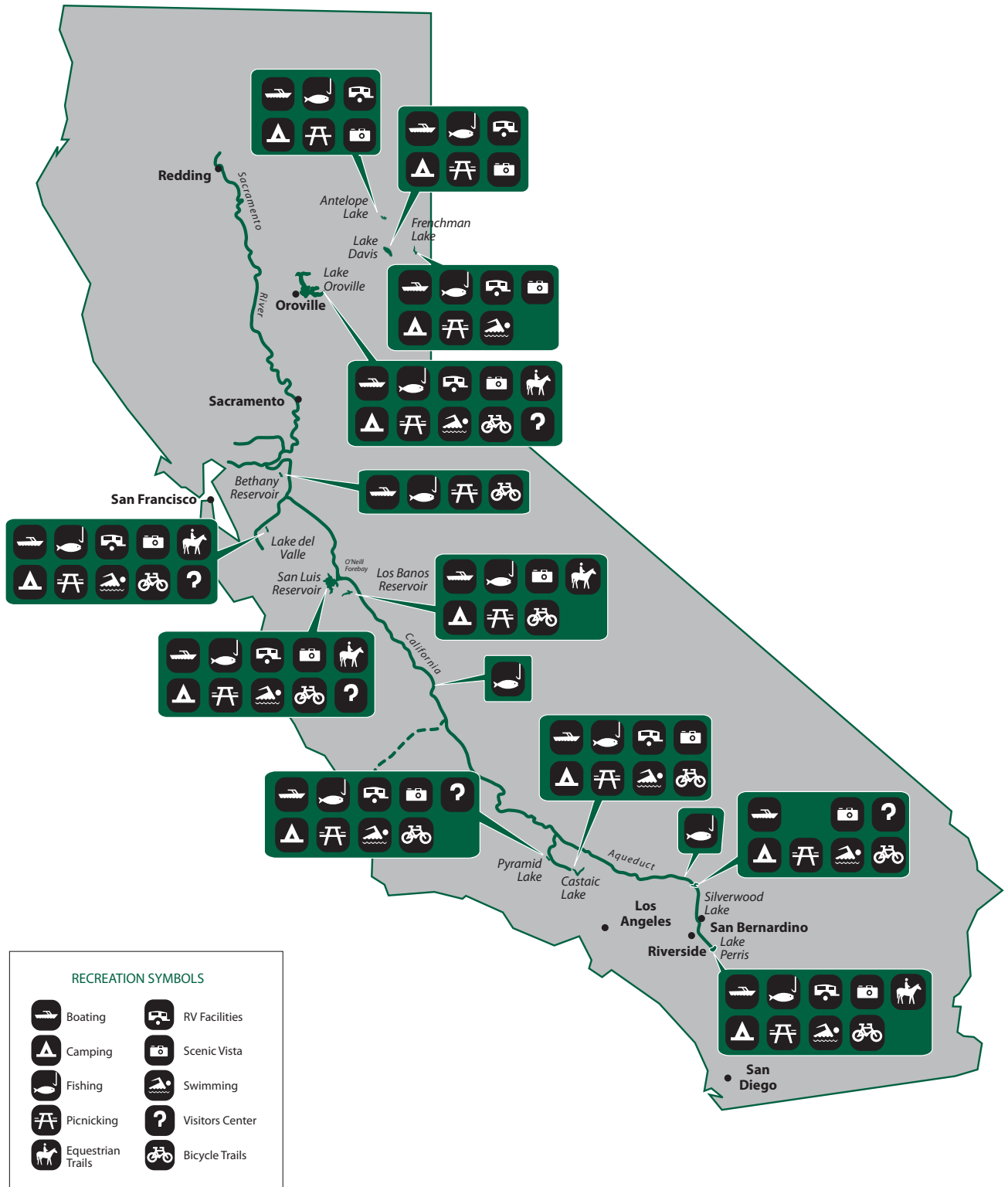


Figure 13-2 Types of Recreation along the SWP

- DWR, California State Parks, and the Department of Forestry and Fire Protection hosted a Catch A Special Thrill (C.A.S.T.) fishing event for 34 disabled and disadvantaged children.
- California State Parks held a trail clean-up day. It was estimated that 25 cubic yards of trash and tires were removed from the areas, by 45 volunteers from the public and California State Parks.
- California State Parks held the annual Spring Wildflower Wilderness Festival and 300 visitors attended.
- DWR and California State Parks held a Native Ways Celebration. Two hundred attendees learned about Maidu culture and history.
- California State Parks hosted Bidwell Bar Days at Bidwell Canyon Campground. Three hundred eighty-six visitors were treated to a day in the life of the old west.
- California State Parks hosted Frontier Christmas at the Lake Oroville Visitors Center. Visitors learned how to make pioneer crafts and pan for real gold. An estimated 1,086 people attended the event.
- hosted a “Park’n It” Summer Day Camp Program serving 65 children;
- held a Coastal Clean-up Day where 242 volunteers cleaned up the lake shoreline. Volunteers worked more than 968 hours and removed 542 pounds of trash;
- hosted five fishing programs serving 38 participants;
- with DWR and the Richmond Police Athletics League, co-sponsored two Aquatic Adventure Camps that served 80 children;
- with DWR and the Livermore Area Recreation and Park District, co-sponsored one Aquatic Adventure Camp that served 40 children; and
- with DWR, hosted the annual C.A.S.T. fishing event, which paired 32 disabled and disadvantaged children with experienced fishermen for a day of fishing on Lake del Valle. The event was featured in a special KGO Radio “Spotlight 810” report that aired later that summer.

Lake del Valle State Recreation Area

East Bay Regional Park District sponsored the following activities in 2011:

- held the Newfoundland Water Dog Trials;
- hosted the Tri-Valley Masters Open Water Swim;
- held the Ohlone 50K Run;
- hosted the Two Day Town Music Festival;
- hosted 30 campfire programs serving 2,758 individuals;
- hosted seven school programs serving 209 children;
- hosted 12 Regional In Nature programs led by naturalists serving 214 individuals and 20 non-Regional In Nature programs serving 365 individuals;
- hosted a Community Outreach Overnight Program serving 250 individuals;
- hosted two Junior Lifeguard programs for 535 participants;
- conducted three Aquatic Adventure Camp sessions for 400 participants;
- taught four moonlight kayak classes with 80 participants in each class—the participants learned about the environment at Castaic Lake, the SWP, water safety, and boating safety;
- hosted “Splash in the Water” events with 400 children who learned about water safety, kayaking, canoeing, stand-up paddleboarding, and sailing;
- held two sessions of FamCamp programs for 80 participants, to teach about camping, leave-no-trace principles, water safety, and kayaking;

Castaic Lake State Recreation Area

The County of Los Angeles Department of Parks and Recreation sponsored the following activities in 2011:

- taught 30 stand-up paddleboarding classes to a total of 300 participants, every Saturday from May through October, with an average class size of 25 participants;
- hosted 30 kayak clinics for a total of 500 participants, every Saturday from May through October, to teach about water safety, boating safety, and the environment at Castaic Lake; and
- hosted, along with DWR, a C.A.S.T. fishing event for 51 disabled and disadvantaged children.

Silverwood Lake State Recreation Area

California State Parks sponsored the following activities:

- held Bald Eagle tours every Saturday from January through March;
- hosted an Adopt-a-School program for 100 participants;
- hosted five school barge tours for 105 participants;
- held a Coastal Clean-up Day where six volunteers cleaned up the shoreline;
- conducted several Outdoor Youth Connection events where select urban middle and high school students came to the park to learn leadership and life skills; and
- hosted, along with DWR and its partner agencies, a C.A.S.T. fishing event on Silverwood Lake, which paired 37 disabled and disadvantaged children with experienced fishermen for a day of fishing.

Lake Perris State Recreation Area

California State Parks sponsored the following activities:

- hosted 12 Junior Ranger programs conducted by a State Park Interpreter for participants aged 3–15. Programs were

held Saturday mornings from Memorial Day weekend through Labor Day;

- hosted 12 campfire programs;
- hosted a Junior Lifeguard program for 25 participants, aged 8–15 years. This 4-week program taught children about natural and cultural resources, first aid, and CPR. It also helped children gain experience needed to apply for a job as a State lifeguard;
- participated in a national Bald Eagle count;
- with DWR, hosted three sessions of Aquatic Adventure Camp. More than 150 children participated in this program and learned basic first aid, CPR, how to manage basic aquatic emergencies, swimming strokes, and a variety of aquatic recreation activities; and
- with DWR and its partner agencies, hosted a C.A.S.T. fishing event, which paired 14 disabled and disadvantaged children with experienced fishermen for a day of fishing on the lake. The event was also featured on the *Funky Fishing Show*, a late-night cable television program that emphasized the joys of fishing.

Oroville Recreation Plan

The Oroville Facilities, including Lake Oroville State Recreation Area, Oroville Wildlife Area, and adjacent DWR facilities, are operated in conformance with the 1993 Amended Recreation Management Plan that was approved by the Federal Energy Regulatory Commission (FERC) in its 1994 Order 2100-054. In 2006, DWR and its Settlement Agreement signatories submitted a new Settlement Agreement Recreation Management Plan (SARMP, March 2006) for FERC approval. The approved SARMP will be implemented when the new hydropower license is issued by FERC, currently expected sometime in 2014 or later.

Additional need-based recreation improvements identified and proposed in

the SARMP are anticipated to be constructed after the new FERC license is issued. The new license terms and conditions are expected to be consistent with the proposed SARMP. In the meantime, DWR and its DDA collaborating partners California State Parks, California State Parks' Division of Boating and Waterways (formerly the Department of Boating and Waterways), and the Department of Fish and Wildlife (DFW) will continue to operate Oroville Facilities' recreational installations consistent with the existing FERC license (renewed annually) and its associated 1993 Amended Recreation Management Plan.

Fish Plantings

In 2011, DFW planted 761,200 fish in SWP reservoirs (see Table 13-2), 41 percent more than the 538,500 fish planted in 2010, but less than the 879,500 fish planted in 2009.

With the exception of Silverwood Lake, all of the SWP reservoirs received more fish in 2011. Silverwood Lake received 35 percent less than in 2010. However, Lake Davis received 66 percent more Eagle Lake Trout than in 2010, and Frenchman Lake received 132 percent more Eagle Lake Trout than in 2010. Lake Oroville received 25 percent more Coho Salmon than in 2010, and Pyramid Lake and Lake Perris received 103 percent and 24 percent more trout, respectively, than in 2010.

SWP Deliveries for Recreation

DWR has an agreement with California State Parks to provide onshore recreation water at several SWP facilities in an amount prorated to the yearly SWP Table A allocation. Per the 80 percent SWP Table A allocation for 2011, maximum diversion amounts under the onshore recreation agreement were allocated at 80 percent, or a total of 5,424 acre-feet (af), as follows: 2,200 af at

San Luis Reservoir; 320 af at Lake del Valle; 1,864 af at Castaic Lake and Castaic Lagoon; 1,000 af at Lake Perris; and 40 af at Bethany Reservoir. Actual deliveries under the agreement totaled 553 af as follows: 2 af at San Luis Reservoir, 122 af at Lake del Valle, 221 af at Castaic Lake, 208 af at Lake Perris, and 0 af at Bethany Reservoir. DWR also delivered 81 af to California State Parks at Silverwood Lake and 23 af at Pyramid Lake. Further detail on these deliveries is provided in Chapter 9, Water Contracts and Deliveries.

Recreation Financing

Prior to 2001, DWR reported capital costs allocated to fish and wildlife enhancement and recreation in Bulletin 132, Appendix D, *Costs of Recreation and Fish and Wildlife Enhancement (R&FWE)*. This report is no longer mandated by the Legislature. DWR initially began reporting recreation capital cost information in this bulletin for fiscal year 2000–2001.

The approach to financing R&FWE in connection with the SWP is provided in the DDA (California Water Code [CWC] Sections 11900–11925, 1961) and the Burns-Porter Act (CWC Section 12937, 1959). Additionally, as early as 1953, financing for R&FWE was addressed in CWC Sections 233, 345, 346, 12581, and 12582. These statutes declare that recreation at the SWP is a benefit to all the people of California and that the associated costs should be borne by all Californians. While this intent is cited in the DDA, no specific appropriation or funding source was defined. Consequently, Assembly Bill (AB) 12 in 1966, Senate Bill (SB) 1268 in 1970, and the Environmental Water Act, AB 1441 and AB 1442 in 1989, were all enacted to provide the necessary State funding for this SWP purpose. The DDA does, however, explicitly preclude DWR from including R&FWE costs in the SWP charges for water and power billed to the public water agencies contracting for SWP water supply.

Table 13-2 Fish Planted by Department of Fish and Wildlife in 2011 (thousands)

Location and Size	Eagle Lake Trout	Brook Trout	Rainbow Trout	Coho Salmon	Chinook Salmon	Kokanee Salmon	Total for Lake
Antelope Lake							48.4
Catchables	17.1	13.8	17.5				
Lake Davis							88.4
Fingerlings	32.8						
Catchables	55.6						
Frenchman Lake							178.9
Fingerlings	150.4						
Catchables	28.5						
Lake Oroville							229.6
Catchables				229.6			
Thermalito Forebay	No Fish Planted						
Lake del Valle							42.8
Fingerlings					15.0	20.0	
Catchables	4.2		3.6				
Los Banos Reservoir	No Fish Planted						
Pyramid Lake							49.3
Catchables	4.0		45.3				
Castaic Lake							55.2
Catchables			55.2				
Castaic Lagoon	No Fish Planted						
Silverwood Lake							26.4
Sub-catchables	9.7						
Catchables	16.7						
Lake Perris							42.2
Catchables	6.6		35.6				
Super-catchables			0.02				
Total	325.6	13.8	157.2	229.6	15.0	20.0	761.2

Note: DFW provided this information. It uses the following size classes:

fingerlings = 16.1 or more fish/pound; sub-catchables = 6.1 to 16 fish/pound; catchables = 1 to 6 fish/pound;

super-catchables = 0.99 to 0.34 fish/pound; and trophy = fewer than 0.32 fish/pound.

The Legislature has intermittently appropriated monies to meet State obligations to fund R&FWE at the SWP. AB 12 appropriated \$5 million per year to DWR from \$90 million tidelands oil and gas revenues. By the early 1980s, DWR had expended the entire \$90 million toward funding SWP R&FWE obligations. SB 1268 appropriated \$55 million to California State Parks and \$5 million to DFW specifically for their responsibilities under the DDA at SWP facilities. Finally, AB 1442 appropriated \$172 million to reimburse DWR for SWP R&FWE costs incurred over the previous dozen years as an offset to DWR's California Water Fund repayment, and an additional \$30 million for SWP R&FWE through 1994.

While no other appropriations to DWR for SWP R&FWE costs have been made by the Legislature, DWR has used its authority under the Burns-Porter Act to carry out and fund all SWP project purposes, including R&FWE, with State Water Resources Development System revenues. The Legislature did, however, in the fiscal year 2011–2012 budget effective July 1, 2011, request that the Natural Resources Agency convene a DDA Working Group (WG) to develop an implementable solution to the SWP R&FWE funding dilemma. The WG consisted of the Natural Resources Agency's Secretary's Office as chair and included the Department of Finance, the Legislative Analyst's Office, legislative staff, DWR, and selected public water agency SWP water supply contractors. The WG was convened in late 2011, and was essentially tasked with identifying an implementable long-term solution to reliable SWP R&FWE funding, while also ensuring the Department of Finance and the Legislature remained in control of State general funds, which are separate and apart from funds authorized to DWR under the Burns-Porter Act.

Capital Cost Allocations

Table 13-3 shows capital costs allocated to R&FWE and overall costs of lands acquired for recreation development through 2011. Total capital costs increased by \$1,252,972 since Bulletin 132-11, due to an increase of \$1,252,340 in 2011 and an upward adjustment of \$632 in years prior to 2011. The increase in 2011 included \$1,225,090 in joint costs, and \$27,250 in specific costs. These costs are budgeted by DWR from funds available for financing project construction costs. Recreation and enhancement costs not reported in this table are budgeted by several State departments and are financed by appropriations from a variety of funds.

Accrued Interest Charges

Table 13-4 details accrued interest charges included in the costs shown in Table 13-3 and reimbursements through December 2011. These interest accruals were calculated through October 2001 on the portion of annual disbursements financed by the California Water Resources Development Bond Fund, based on the weighted average interest costs of Burns-Porter and Water System Revenue Bonds sold to date, and are reported here for historical reference. The reimbursements were included in DWR's budget as appropriations from the General Fund and are used by DWR to pay for operations, maintenance, power, and replacement costs associated with operating the SWP for R&FWE.

For a more detailed discussion of these legislative provisions, and DWR's procedures for reporting and tabulating recreation and enhancement costs, please see the last Appendix D (to Bulletins 132-98, 132-99, 132-00, and 132-01).

Table 13-3 Recreation and Enhancement Costs of the State Water Project (in dollars)

Facility	Joint Costs Allocated to Recreation and Enhancement						
	1952-2010 Updated	2011	Subtotal	Interest	Total	B132-11 Costs	Increase/Decrease
Frenchman Dam and Lake (78.5%)							
California Water Resources Development Bond Fund	102,997	0	102,997	2,097	105,094	105,094	0
All Other Funds	2,719,905	10	2,719,915	0	2,719,915	2,719,905	10
Antelope Dam and Lake (100%)							
California Water Resources Development Bond Fund	1,033,261	0	1,033,261	113,788	1,147,049	1,147,049	0
All Other Funds	4,625,780	0	4,625,780	0	4,625,780	4,625,718	62
Grizzly Valley Dam and Lake Davis (99.0%)							
California Water Resources Development Bond Fund	4,003,092	0	4,003,092	486,754	4,489,846	4,489,846	0
All Other Funds	4,109,455	777	4,110,232	0	4,110,232	4,109,455	777
Other Feather River Projects^a							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	746,168	3	746,171	0	746,171	746,168	3
Delta Facilities							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	13,100,306	225,747	13,326,053	0	13,326,053	13,100,306	225,747
San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir (3.4%)							
California Water Resources Development Bond Fund	988,910	0	988,910	169,085	1,157,995	1,157,995	0
All Other Funds	3,533,545	(258)	3,533,287	0	3,533,287	3,533,545	(258)
California Aqueduct Delta to Dos Amigos Pumping Plant (3.4%)							
California Water Resources Development Bond Fund	4,467,667	0	4,467,667	897,406	5,365,073	5,365,073	0
All Other Funds	4,763,826	37,124	4,800,950	0	4,800,950	4,763,826	37,124
Oroville Division (2.9%)							
California Water Resources Development Bond Fund	5,725,216	0	5,725,216	1,790,491	7,515,707	7,515,707	0
All Other Funds	6,079,855	(7,827)	6,072,028	0	6,072,028	6,078,891	(6,863)
Del Valle Dam and Lake del Valle (48.0%)							
California Water Resources Development Bond Fund	10,546,762	0	10,546,762	6,813,560	17,360,322	17,360,322	0
All Other Funds	4,208,966	9,998	4,218,964	0	4,218,964	4,208,966	9,998
California Aqueduct Dos Amigos Pumping Plant to Termini (5.7%)							
California Water Resources Development Bond Fund	48,382,162	0	48,382,162	75,353,773	123,735,935	123,735,935	0
All Other Funds	90,993,089	959,516	91,952,605	0	91,952,605	90,993,483	959,122
<i>Subtotal</i>	<i>210,130,962</i>	<i>1,225,090</i>	<i>211,356,052</i>	<i>85,626,954</i>	<i>296,983,006</i>	<i>295,757,284</i>	<i>1,225,722</i>
Specific Costs of Acquiring Land for Recreation Development							
Frenchman Dam and Lake							
California Water Resources Development Bond Fund	3,379	0	3,379	160	3,539	3,539	0
All Other Funds	49,950	0	49,950	0	49,950	49,950	0
Grizzly Valley Dam and Lake Davis							
California Water Resources Development Bond Fund	204,475	0	204,475	17,573	222,048	222,048	0
All Other Funds	554,246	0	554,246	0	554,246	554,246	0
Abbey Bridge Dam and Reservoir							
California Water Resources Development Bond Fund	9	0	9	0	9	9	0
All Other Funds	9,921	0	9,921	0	9,921	9,921	0
Antelope Dam and Lake							
California Water Resources Development Bond Fund	3,167	0	3,167	0	3,167	3,167	0
All Other Funds	201,137	0	201,137	0	201,137	201,137	0
San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir							
California Water Resources Development Bond Fund	395,284	0	395,284	33,467	428,751	428,751	0
All Other Funds	867,243	0	867,243	0	867,243	867,243	0
California Aqueduct Delta to Dos Amigos Pumping Plant							
California Water Resources Development Bond Fund	422,681	0	422,681	158,456	581,137	581,137	0
All Other Funds	(91,879)	0	(91,879)	0	(91,879)	(91,879)	0
Oroville Division							
California Water Resources Development Bond Fund	7,809,509	0	7,809,509	3,673,041	11,482,550	11,482,550	0
All Other Funds	5,938,028	27,250	5,965,278	0	5,965,278	5,938,028	27,250
Del Valle Dam and Lake del Valle							
California Water Resources Development Bond Fund	519,425	0	519,425	448,292	967,717	967,717	0
All Other Funds	(32,202)	0	(32,202)	0	(32,202)	(32,202)	0
California Aqueduct Dos Amigos Pumping Plant to Termini							
California Water Resources Development Bond Fund	478,971	0	478,971	915,217	1,394,188	1,394,188	0
All Other Funds	419,088	0	419,088	0	419,088	419,088	0
Castaic Dam and Lake							
California Water Resources Development Bond Fund	1,954,297	0	1,954,297	3,856,203	5,810,500	5,810,500	0
All Other Funds	951,352	0	951,352	0	951,352	951,352	0
Cedar Springs Dam and Silverwood Lake							
California Water Resources Development Bond Fund	424,966	0	424,966	817,173	1,242,139	1,242,139	0
All Other Funds	370,164	0	370,164	0	370,164	370,164	0
Perris Dam and Lake Perris							
California Water Resources Development Bond Fund	1,022,313	0	1,022,313	2,033,799	3,056,112	3,056,112	0
All Other Funds	4,939,976	0	4,939,976	0	4,939,976	4,939,976	0
<i>Subtotal</i>	<i>27,415,500</i>	<i>27,250</i>	<i>27,442,750</i>	<i>11,953,381</i>	<i>39,396,131</i>	<i>39,368,881</i>	<i>27,250</i>
Total Recreation and Enhancement Costs							
California Water Resources Development Bond Fund	88,488,543	0	88,488,543	97,580,335	186,068,878	186,068,878	0
All Other Funds	149,057,919	1,252,340	150,310,259	0	150,310,259	149,057,287	1,252,972
Total	237,546,462	1,252,340	238,798,802	97,580,335	336,379,137	335,126,165	1,252,972

^a Actual capitalized costs for facilities not yet constructed..

Table 13-4 Calculation of Interest Accruals on California Water Resources Development (WRD) Bond Fund Disbursements (in dollars at 4.608% per annum)

Facility	1952-2010				2011				2012 Beginning of Year Balance to be Reimbursed					
	Disbursements		Reimbursements		Disbursements		Reimbursements		Disbursements		Reimbursements		Interest Accrual ^a	
	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds
Frenchman Dam and Lake	102,997	2,719,905	104,900	2,719,468	0	10	0	0	102,997	2,719,915	104,900	2,719,468	2,097	2,097
Antelope Dam and Lake	1,033,261	4,625,780	1,140,322	4,478,932	0	0	0	0	1,033,261	4,625,780	1,140,322	4,478,932	113,788	113,788
Grizzly Valley Dam and Lake Davis	4,003,092	4,109,455	4,444,594	2,568,667	0	777	0	0	4,003,092	4,110,232	4,444,594	2,568,667	486,754	486,754
Oroville Division	5,725,216	6,079,855	7,324,529	4,570,269	0	(7,827)	0	0	5,725,216	6,072,028	7,324,529	4,570,269	1,790,491	1,790,491
Other Feather River Projects	0	746,168	0	0	0	3	0	0	0	746,171	0	0	0	0
Delta Facilities	0	13,100,306	0	0	0	225,747	0	0	0	13,326,053	0	0	0	0
Del Valle Dam and Lake del Valle	10,546,762	4,208,966	16,463,934	3,130,016	0	9,998	0	0	10,546,762	4,218,964	16,463,934	3,130,016	6,813,560	6,813,560
California Aqueduct Delta to Dos Amigos Pumping Plant	4,467,667	4,763,826	5,267,351	4,092,435	0	37,124	0	0	4,467,667	4,800,950	5,267,351	4,092,435	897,406	897,406
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	988,910	3,533,545	1,938,244	2,725,578	0	(258)	0	0	988,910	3,533,287	1,938,244	2,725,578	169,085	169,085
California Aqueduct Dos Amigos Pumping Plant to Termini	48,382,162	90,993,089	113,035,518	49,410,851	0	959,516	0	0	48,382,162	91,952,605	113,035,518	49,410,851	75,353,773	75,353,773
Subtotal	75,250,067	134,880,895	149,719,392	73,696,216	0	1,225,090	0	0	75,250,067	136,105,985	149,719,392	73,696,216	85,626,954	85,626,954
	Specific Costs of Acquiring Land for Recreation Development													
Frenchman Dam and Lake	3,379	49,950	3,520	49,947	0	0	0	0	3,379	49,950	3,520	49,947	160	160
Grizzly Valley Dam and Lake Davis	204,475	554,246	220,423	554,244	0	0	0	0	204,475	554,246	220,423	554,244	17,573	17,573
Abbey Bridge Dam and Reservoir	9	9,921	9	9,921	0	0	0	0	9	9,921	9	9,921	0	0
Antelope Dam and Lake	3,167	201,137	0	0	0	0	0	0	3,167	201,137	0	0	0	0
Oroville Division	7,809,509	5,938,028	11,028,039	6,497,333	0	27,250	0	0	7,809,509	5,965,278	11,028,039	6,497,333	3,673,041	3,673,041
Del Valle Dam and Lake del Valle	519,425	(32,202)	917,078	(32,200)	0	0	0	0	519,425	(32,202)	917,078	(32,200)	448,292	448,292
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	395,284	867,243	425,700	415,610	0	0	0	0	395,284	867,243	425,700	415,610	33,467	33,467
California Aqueduct Delta to Dos Amigos Pumping Plant	422,681	(91,879)	603,887	(137,494)	0	0	0	0	422,681	(91,879)	603,887	(137,494)	158,456	158,456
California Aqueduct Dos Amigos Pumping Plant to Termini	478,971	419,088	1,271,912	398,349	0	0	0	0	478,971	419,088	1,271,912	398,349	915,217	915,217
Castaic Dam and Lake	1,954,297	951,352	5,291,258	951,070	0	0	0	0	1,954,297	951,352	5,291,258	951,070	3,856,203	3,856,203
Cedar Springs Dam and Silverwood Lake	424,966	370,164	1,132,207	370,137	0	0	0	0	424,966	370,164	1,132,207	370,137	817,173	817,173
Perris Dam and Lake Perris	1,022,313	4,939,976	2,780,487	4,867,247	0	0	0	0	1,022,313	4,939,976	2,780,487	4,867,247	2,033,799	2,033,799
Subtotal	13,238,476	14,177,024	23,674,520	8,096,564	0	27,250	0	0	13,238,476	14,204,274	23,674,520	8,096,564	11,953,381	11,953,381
Total	88,488,543	149,057,919	173,393,912	81,792,780	0	1,252,340	0	0	88,488,543	150,310,259	173,393,912	81,792,780	97,580,335	97,580,335

^a Accrued interest not calculated since October 2001 when SB 1191 amended CWC Section 11912 so that DWR was no longer required to report these costs annually to the Legislature or to submit cost allocations to the California State Parks' Division of Boating and Waterways, California State Parks, and the Department of Fish and Wildlife.



Chapter 14

Financial Analysis

Clifton Court Forebay.

Significant Events in 2011

On September 7, the Department of Water Resources (DWR) delivered \$92.275 million of Water System Revenue Bonds, series AI. The proceeds were presold on November 8, 2010, to refinance previously issued bonds and to pay bond financing costs.

On October 13, DWR delivered \$216.930 million of Water System Revenue Bonds, series AJ. The proceeds were presold on October 5 to refinance commercial paper and previously issued bonds, finance long-term construction expenditures, and pay bond financing costs.

Information for this chapter was provided by the State Water Project Analysis Office in conjunction with the Division of Fiscal Services.

This chapter presents both a summary and a detailed explanation of the State Water Project's (SWP) current financial analysis, capital costs and requirements, revenues and expenses, and bond activities for years 2011 through 2021.

The Department of Water Resources (DWR) performs a financial analysis annually to ensure the SWP financing program will have sufficient funds to meet construction obligations; project operation, maintenance, power, and replacement costs; and debt service payments for bonds expended for construction. The results of the current financial analysis, dated December 31, 2011, are presented in Tables 14-1 and 14-2, located at the end of this chapter. (Please note that, in some instances, the tables in this chapter may not sum due to rounding.)

Future contingencies may change the financial analysis, some of which include:

- alterations in schedules of currently planned construction for future facilities;
- changes in economic conditions, including changes in interest rates and in SWP water contractor Table A amounts due to changes in amounts of water needed, conserved, or reclaimed;
- development of additional sources of water not foreseen at this time;
- deviations from the assumptions regarding actual rates of price escalations for future construction from those currently assumed for cost estimates;
- increases in capital costs related to additional conservation facilities; and
- outcome of lawsuits now pending before the courts.

Capital Requirements and Financing

In conducting the current financial analysis, DWR projected future construction costs through the year 2021 plus reimbursement of \$82 million interim financing for prior expenditures will total \$1.61 billion. Special capital requirements for revenue bond financing of these construction costs are projected at \$162 million for a total capital requirement of \$1.77 billion. This projection includes construction and financing costs for the following significant SWP projects planned for completion by 2021:

- Perris Dam remediation;
- Phase II enlargement of the East Branch of the California Aqueduct;
- Phase I improvements to the East Branch Extension;
- Phase II of the East Branch Extension;
- enlargement of and improvement to the South Bay Aqueduct (SBA); and
- a new intake to the North Bay Aqueduct.

Most of these capital requirements will be financed from the projected sale of \$1.72 billion of revenue bonds. The remaining \$45 million will be financed from capital resources revenues and the transfer of excess revenues not needed for operation costs or debt service.

The analysis of capital requirements and financing presented in Table 14-1 does not include the costs and financing of all facilities needed to develop the remaining yield necessary to meet the

total 4.2 million acre-foot contractual commitment to long-term SWP water contractors. Table 14-1 also does not include the costs of associated work essential for realizing full benefits from the SWP, but financed and constructed by local interests or State agencies other than DWR. Those facilities include on-shore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures for various SWP purposes is detailed in Table 14-3.

Capital Requirements

Lines 1 through 20 in Table 14-1 show actual and projected SWP capital requirements through 2021. Estimates of future capital expenditures include allowances for construction cost escalation of 5 percent per year from 2012 through 2021. Right-of-way costs are escalated at 4 percent per year from 2012 through 2021. Capital expenditures for the SWP also include requirements other than those for construction, such as disbursements made as part of the Davis-Grunsky Act Program (Line 16) and special capital requirements under revenue bond financing (Line 17). DWR will decide whether to construct facilities only after examining alternatives and completing environmental documentation and other review processes.

Line 1, Initial Project Facilities, includes only those facilities completed in the initial construction program, which concluded December 31, 1973 (see Bulletin 132-74, Chapter 2). Additional costs after 1973, and estimated costs of remaining work on the initial SWP facilities, are not included.

Line 2, North Bay Aqueduct, consists of the estimated costs for improvements and the historical costs for Phase II. Operational in May 1988, Phase II connected with the Phase I facilities, which were completed in 1968 (Phase I costs are included in the initial

project facilities discussed in Line 1). Phase II included costs for pipelines, pumping plants, and a small reservoir necessary to divert water from the western Delta to Napa and Solano counties for urban use. The improvements consist of replacing the existing tank with two 5-million gallon tanks. Construction of the new tanks began in 2007 and was completed in 2010.

Line 3, Delta and Suisun Marsh Facilities, shows historical costs that include planning for general Delta facilities and the previously planned peripheral canal and overland water delivery facilities for the western Delta. Also included are historical planning costs for Suisun Marsh as well as construction costs for the Suisun Marsh Salinity Control Gates and an access road. The projected amounts include projected planning costs plus projected costs for fish screens at Sherman and Twitchell islands.

Line 4, Final Four Units at Banks Pumping Plant, includes costs of the final four 1,067 cubic feet per second units, which became operational in spring 1992.

Line 5, Coastal Branch Aqueduct, includes all costs for the planning, design, and construction of Phase II of the Coastal Branch of the California Aqueduct. Phase II construction began in October 1993 and was completed in 1997. Water deliveries from Phase II facilities began in July 1997.

Line 6, West Branch Aqueduct, shows costs for all facilities on the West Branch except Warne Powerplant. Those costs are included in Line 11.

Line 7, East Branch Enlargement, includes expenditures for Phases I and II of the East Branch Enlargement. Phase I included the enlargement share of power plant costs at Mojave Siphon and Devil Canyon. (The remaining power plant costs are included in Line 11.) East Branch Enlargement costs for Phase I, by facility, are presented in

Table 14-3 Allocation of Capital Expenditures (in thousands of dollars)

Facilities and Construction Divisions	Expenditures Incurred Through 2011	Future Expenditures	Total	Preliminary Allocation Among Project Purposes			
				Water Supply and Power Generation	Flood Control ^b	Recreation and Fish and Wildlife Enhancement	Other ^b
Project Construction Expenditures							
Upper Feather Division	19,926	3	19,929	1,561	0	18,368	0
Oroville Division (excludes Small Hydro)	642,363	25,623	667,987	570,710	71,690	25,587	0
Delta Facilities Division	422,585	87,603	510,188	491,466	0	18,722	0
North Bay Aqueduct	108,523	407,433	515,956	515,956	0	0	0
South Bay Aqueduct	344,347	19,957	364,304	340,847	8204	15,253	0
California Aqueduct							
North San Joaquin Division	277,338	36,566	313,904	303,069	0	10,835	0
San Luis Division	274,263	14,724	288,987	275,912	0	13,075	0
South San Joaquin Division	317,555	7,935	325,490	307,708	0	17,782	0
Tehachapi Division	368,880	5,752	374,631	353,623	0	21,008	0
Mojave Division (excludes Small Hydro)	348,370	20,653	369,023	328,616	0	40,407	0
Santa Ana Division	291,512	176,429	467,941	424,005	0	43,936	0
West Branch	557,876	6,807	564,683	531,986	0	32,697	0
Coastal Branch	491,970	19,029	510,999	510,999	0	0	0
<i>Subtotal, California Aqueduct</i>	<i>2,927,765</i>	<i>287,895</i>	<i>3,215,660</i>	<i>3,035,919</i>	<i>0</i>	<i>179,741</i>	<i>0</i>
Other Project Facilities							
Small Hydroelectric Power							
Generating Facilities	99,776	0	99,776	99,776	0	0	0
Off-Aqueduct Power							
Generating Facilities	488,720	0	488,720	488,720	0	0	0
East Branch Enlargement	461,014	435,518	896,532	896,532	0	0	0
East Branch Extension	169,013	209,602	378,615	378,615	0	0	0
Coastal Power Allocation	30,708	0	30,708	30,708	0	0	0
Agricultural Drainage Facilities	80,037	11,270	91,307	0	0	0	91,307
Planning and Preoperations	65,720	31,700	97,420	97,420	0	0	0
Unassigned/Miscellaneous	76,536	8,074	84,610	0	0	0	84,610
<i>Subtotal, Project Construction Expenditures</i>	<i>5,937,034</i>	<i>1,524,678</i>	<i>7,461,712</i>	<i>6,948,230</i>	<i>79,894</i>	<i>257,670</i>	<i>175,917</i>
Other Capital Requirements							
Davis-Grunsky Act Program	130,000	0	130,000	0	0	0	130,000
Total Capital Expenditures	6,067,034	1,524,678	7,591,712	6,948,230	79,894	257,670	305,917

^aReflects DWR's allocation to this purpose, irrespective of federal payments.

^bIncludes costs currently unassigned to purpose, planning costs of deleted features of project facilities, initial costs of inventoried items, and costs assigned to the Davis-Grunsky Act Program.

Table 14-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement. Construction of Unit 2 was deferred.

Work on the environmental impact report, mapping, and preliminary design for Phase II of the enlargement began in March 2007. Construction is projected to be completed in 2020. Project costs include raising the canal embankment and concrete lining, constructing additional siphon barrels, adding bays to check structures, constructing Unit 2 at Alamo Powerplant, and adding two pump/motor units and a discharge line at Pearblossom Pumping Plant.

All costs in Line 7 are allocated to and repaid by the seven Southern California contractors participating in the East Branch Enlargement.

Line 8, East Branch Improvements, shows all aqueduct costs on the East Branch not allocated to the enlargement project. Those costs include improvements constructed concurrently with the enlargement work, the reconstruction of the San Bernardino Tunnel Intake, and the construction of the Tehachapi East Afterbay. Costs for power plant construction at Alamo, Mojave Siphon, and Devil Canyon are not included in this line.

Line 9, East Branch Extension, shows expenditures for Phases I and II of the extension of the East Branch of the California Aqueduct. The East Branch Extension extends the California Aqueduct east from the Devil Canyon Powerplant to a terminus at Noble Creek near Beaumont in Riverside County. The extension provides water service to the San Geronio Pass Water Agency and the San Bernardino Valley Municipal Water District. Construction of Phase I began in February 1999 and was completed in 2003. Phase I improvements include enlargement of the Crafton Hills Reservoir and construction of the Yucaipa Connector Pipeline. Construction of this phase is to be completed in 2013. Phase II will increase

the pumping capacity to 100 percent of design capacity. Construction of Phase II is anticipated to begin in 2012. All costs in Line 9 will be allocated to and repaid by the two participating contractors.

Line 10, South Bay Aqueduct Improvements and Enlargement, shows expenditures for providing additional capacity required to meet increases in water demands for the service area of Alameda County Flood Control and Water Conservation District, Zone 7, and increasing the existing capacity of the SBA to its original design capacity. Construction began in 2006 and is scheduled to be completed in 2013.

Line 11, Power Generation and Transmission Facilities, does not include the East Branch Enlargement share of costs for Alamo, Mojave Siphon, and Devil Canyon powerplants shown in Line 7 of Table 14-1. The capital costs for facilities included in Line 11 are shown in Table 14-5.

Line 12, Additional Conservation Facilities, shows projected costs to plan and study additional conservation facilities. Specific planning activities and projected spending amounts for 2012 through 2021 are shown in Table 14-6. Expenditures for these items are being reviewed. Construction costs of additional conservation facilities are not included in the financial analysis.

Line 12 does not include the Bay Delta Conservation Plan costs. DWR's share of the Bay Delta Conservation Plan expenditures for preliminary planning and environmental impact report preparation are currently financed by participating contractors.

Line 13, Agricultural Drainage Facilities, includes projected costs of the Agricultural Drainage Program. The activities in this program are monitoring, evaluating, reducing, and treating drainage, as well as investigating treatment and reuse of drainage water.

Table 14-4 East Branch Enlargement Capital Costs by Facility

Facility	Amount (in millions of dollars)
Aqueduct and Siphons	128.1
Pearblossom Pumping Plant	70.1
Alamo Powerplant	5.0
Mojave Siphon Powerplant	47.3
Devil Canyon Powerplant and Second Afterbay	202.9
Total	453.4

Table 14-5 Estimated Capital Costs for Power Generation and Transmission Facilities

Power Plants and Transmission Lines	Amount (in millions of dollars)
Power Plants	
Reid Gardner, Unit 4	311.3
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
Warne	84.5
Alamo	44.9
Mojave Siphon	40.8
Thermalito Diversion Dam	14.1
<i>Subtotal</i>	<i>702.9</i>
Transmission Lines	
Midway–Wheeler Ridge	10.7
Geysers–Lakeville	6.9
<i>Subtotal</i>	<i>17.6</i>
Total	720.5

Table 14-6 Estimated Future Costs for Planning Additional Conservation Facilities

Activity	Amount (in millions of dollars)
SWP Future Water Supply	31.7
Other Planning Costs	0.0
Total	31.7

DWR assumes that future costs of the drainage program will be financed by revenue transfers (Line 36).

Line 14, Other Costs, includes items such as general design and construction costs, costs of completing operation and maintenance facilities, and costs of other completion activities for the initial facilities of the California Aqueduct. Portions of those costs ultimately will be allocated to California Aqueduct units described in the preceding paragraphs.

Line 15, Subtotal Project Construction Expenditures, is the total of Lines 1 through 14.

Line 16, Davis-Grunsky Act Program Costs, shows costs of the Davis-Grunsky Act Program, a financial assistance program to provide grants and loans to public agencies for constructing local water projects.

As of December 31, 2011, DWR had disbursed \$130 million (including \$8.5 million for administration) in grants and loans to local agencies throughout the State.

Line 17, Special Capital Requirements Under Revenue Bond Financing, presents special capital requirements at the time revenue bonds are sold. The financial analysis assumes that proceeds from any future revenue bonds will be used to pay for bond discounts, bond issuance costs, and debt service reserve requirements.

Information about the application of proceeds to these special requirements for actual and assumed revenue bond sales is presented in Table 14-7.

Line 18, Total Capital Requirements, is the total of Lines 15, 16, and 17.

Line 19, Power Facilities Capital Requirements, shows the total capital requirements for power facilities included in Line 18.

Line 20, Water Facilities Capital Requirements, shows the total capital requirements for water facilities included in Line 18.

Capital Financing

The SWP was constructed using three general types of financing: Burns-Porter Act, revenue bonds, and capital resources. Lines 21 through 37 of Table 14-1 present specific information about these financing sources.

Burns-Porter Act

Burns-Porter Act financing is derived from the sale of California Water Resources Development Bonds (general obligation bonds) and State tideland oil revenues deposited in the California Water Fund as authorized by the Burns-Porter Act (California Water Code Sections 12930–12944), approved by voters in November 1960. The Burns-Porter Act authorized an issuance of \$1.75 billion of general obligation State bonds, which are repaid by revenues received according to the water supply contracts. Of that authorization, \$130 million was reserved specifically for the Davis-Grunsky Act Program.

Proceeds from the sale of general obligation bonds were deposited in the California Water Resources Development Bond Fund—Bond Proceeds Account, from which monies were expended only for the construction of SWP facilities and for the Davis-Grunsky Act Program. Approximately 26 percent of the expenditures through 2011 for construction and the Davis-Grunsky Act Program were financed with general obligation bonds.

Monies deposited in the California Water Fund were appropriated for purposes outlined in the Burns-Porter Act. Such deposits were derived from a portion of the

Table 14-7 Application of Revenue Bond Proceeds (in millions of dollars)

Bond Series ^a	Construction Expenditures	Other Capital Requirements					Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs ^b	Subtotal	
Oroville	218.0	2.6	19.9	1.5	3.0	27.0	245.0
Devil Canyon-Castaic	126.4	0.0	10.0	0.7	2.1	12.8	139.2
Pyramid Series A	74.0	0.0	19.2	1.0	1.6	21.8	95.8
Reid Gardner Series B	146.1	0.0	41.9	0.0	12.0	53.9	200.0
Reid Gardner Series C	91.1	0.0	17.9	7.9	8.1	33.9	125.0
Small Hydro-South Geysers Series D	49.6	0.0	19.9	0.0	5.5	25.4	75.0
Bottle Rock Series E	96.9	0.0	22.0	3.7	2.4	28.1	125.0
Alamo-South Geysers Series F	59.1	0.0	14.2	0.0	1.7	15.9	75.0
Reid Gardner Series G	1.6	0.0	0.0	0.0	237.9	237.9	239.5
Power Facilities Series H	22.2	0.0	0.0	0.0	184.5	184.5	206.7
East Branch Enlargement Series A	108.3	0.0	12.6	0.0	11.1	23.7	132.0
Water System Facilities Series B	97.4	0.0	0.0	0.0	2.6	2.6	100.0
Water System Facilities Series C	0.6	0.0	0.0	0.0	8.4	8.4	9.0
Water System Facilities Series D	95.9	0.0	2.9	0.0	1.2	4.1	100.0
Water System Facilities Series E	0.4	0.0	0.0	0.0	8.6	8.6	9.0
Water System Facilities Series F	0.0	0.0	0.0	0.0	160.0	160.0	160.0
Water System Facilities Series G	86.8	0.0	4.6	0.0	8.6	13.2	100.0
Water System Facilities Series H	85.5	0.0	5.7	0.0	8.8	14.5	100.0
Water System Facilities Series I	158.9	0.0	5.8	0.0	15.3	21.1	180.0
Water System Facilities Series J	0.0	0.0	0.0	0.0	649.8	649.8	649.8
Water System Facilities Series K	88.6	0.0	3.1	0.0	8.3	11.4	100.0
Water System Facilities Series L	0.0	0.0	0.0	0.0	537.8	537.8	537.8
Water System Facilities Series M	166.3	0.0	9.9	0.0	13.8	23.7	190.0
Water System Facilities Series N	137.4	0.0	6.0	0.0	8.6	14.6	152.0
Water System Facilities Series O	156.5	0.0	8.4	0.0	170.1	178.5	335.0
Water System Facilities Series P	141.6	0.0	5.2	0.0	13.2	18.4	160.0
Water System Facilities Series Q	135.0	0.0	8.0	0.0	123.6	131.6	266.6
Water System Facilities Series R	0.0	0.0	0.0	0.0	20.7	20.7	20.7
Water System Facilities Series S	78.2	0.0	5.8	0.0	116.2	122.0	200.2
Water System Facilities Series T	0.0	0.0	0.0	0.0	135.7	135.7	135.7
Water System Facilities Series U	98.7	0.0	5.3	0.0	103.2	108.5	207.2
Water System Facilities Series V	0.0	0.0	0.0	0.0	20.6	20.6	20.6
Water System Facilities Series W	41.0	0.0	1.3	0.0	218.7	220.0	261.0
Water System Facilities Series X	0.0	0.0	0.0	0.0	160.2	160.2	160.2
Water System Facilities Series Y	0.0	0.0	0.0	0.0	329.9	329.9	329.9
Water System Facilities Series Z	0.0	0.0	0.0	0.0	170.7	170.7	170.7
Water System Facilities Series AA	0.0	0.0	0.0	0.0	108.7	108.7	108.7
Water System Facilities Series AB	92.2	0.0	3.9	0.0	93.6	97.5	189.7
Water System Facilities Series AC	13.7	0.0	0.6	0.0	257.7	258.3	272.0
Water System Facilities Series AD	12.4	0.0	0.9	0.0	99.1	100.0	112.4
Water System Facilities Series AE	383.9	0.0	9.5	0.0	239.5	249.0	632.9
Water System Facilities Series AF	33.4	0.0	1.3	0.0	253.1	254.4	287.7
Water System Facilities Series AG	9.9	0.0	0.4	0.0	158.8	159.2	169.1
Water System Facilities Series AH	71.7	0.0	3.6	0.0	22.3	26.0	97.7
Water System Facilities Series AI	0.0	0.0	0.0	0.0	92.3	92.3	92.3
Water System Facilities Series AJ	69.3	0.0	3.7	0.0	143.9	147.6	216.9
<i>Subtotal</i>	<i>3,248.6</i>	<i>2.6</i>	<i>273.6</i>	<i>14.8</i>	<i>4,953.5</i>	<i>5,244.4</i>	<i>8,493.1^c</i>
Future East Branch Enlargement Bonds	443.1	0.0	20.4	0.0	26.0	46.5	489.5
Future East Branch Extension Bonds	200.6	0.0	9.1	0.0	11.6	20.8	221.4
Future SBA Enlargement Bonds	1.2	0.0	0.1	0.0	0.1	0.1	1.3
Future Water System Facilities Bonds	917.4	0.0	41.8	0.0	53.2	95.0	1,012.4
Total	4,810.9	2.6	345.0	14.8	5,044.4	5,406.8	10,217.7

^a Actual bond issue for all except future East Branch Enlargement, future East Branch Extension, future South Bay Aqueduct Improvements and Enlargement, and future Water System Facilities bonds.

^b Bond financing and refunding costs include funds applied to debt service reserve requirements.

^c Includes \$4,580.9 million of refunded principal, leaving a net principal obligation of \$3,912.1 million.

State tideland oil revenues, in accordance with a continuing authorization. The California Water Fund was used to finance \$508 million, or approximately 8 percent, of the construction expenditures through 2011.

Revenue Bonds

Revenue bond financing is derived from the sale of revenue bonds as authorized by the Central Valley Project Act (California Water Code Sections 11100–11925). DWR's authority to issue revenue bonds was confirmed by a decision of the California Supreme Court in 1963 (*Warne v. Harkness*, 60 Cal. 2d 579).

Proceeds from the sale of revenue bonds are deposited in the Central Valley Water Project Construction Fund, from which money is expended only for purposes specified in the resolution authorizing each bond sale. Those purposes, in addition to paying construction, planning, and right-of-way costs, may include funding the Debt Service Reserve Account, paying interest on bonds, and paying water system operating expenses during a specified period.

As of December 31, 2011, DWR had sold \$8.5 billion of revenue bonds. That amount includes \$4.6 billion of refunded bonds, leaving a total principal obligation of \$3.9 billion.

Capital Resources

Capital resources financing is derived from payments and appropriations (including a portion of the State tideland oil revenues) authorized by a variety of special contracts, cost-sharing agreements, and legislative actions concerning the SWP, plus accrued interest on these funds. Capital resources revenues are deposited in the Central Valley Water Project Construction Fund and may be expended for interest on general obligation bonds and costs of constructing SWP facilities.

According to DWR's financial management policy, the capital resources revenues are used first to cover any general obligation bond debt service that exceeds available revenues.

Capital Financing Sources

Capital financing sources include power revenue bonds, East Branch Enlargement bonds, East Branch Extension bonds, SBA Enlargement bonds, water system facilities bonds, initial project facilities bonds, bond proceeds from the Davis-Grunsky Act Program, California Water Fund monies, and capital resources revenues.

Line 21, Power Facilities Revenue Bonds through Series H, includes the proceeds applied from power revenue bonds for Oroville, Devil Canyon, Castaic, Warne, Reid Gardner, Bottle Rock, Alamo, South Geysers, and small hydro projects.

No future power revenue bond sales are projected for this financial analysis.

Line 22, East Branch Enlargement, Current Bonds, shows that \$474 million of Water System Revenue Bond proceeds has been applied to the East Branch Enlargement project through December 31, 2011. Of this total, \$417 million was used for construction expenditures and \$57 million was used for bond discounts, interest costs, and debt service reserve requirements.

Line 23, East Branch Enlargement, Future Bonds, shows DWR's estimate of \$490 million of bonds required to complete construction of the East Branch Enlargement Phase II.

Line 24, East Branch Extension, Current Bonds, shows that \$193 million of Water System Revenue Bond proceeds has been spent through December 31, 2011.

Line 25, East Branch Extension, Future Bonds, shows DWR's estimate of \$221 million of additional bonds required to complete construction of the East Branch Extension and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 26, South Bay Aqueduct Enlargement, Current Bonds, shows that \$180 million of Water System Revenue Bond proceeds had been spent through December 31, 2011.

Line 27, South Bay Aqueduct Enlargement, Future Bonds, shows DWR's estimate of \$1.3 million of bonds required to complete construction of the SBA Enlargement and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 28, Water System Facilities, Current Bonds, shows that through December 31, 2011, \$1.8 billion of proceeds from Water System Revenue Bonds, Series A through Series AJ, was applied to SWP projects other than the East Branch Enlargement, the East Branch Extension, and the SBA Enlargement. Of this total, \$1.6 billion was used to pay for construction expenditures and \$0.2 billion was used to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 29, Water System Facilities, Future Bonds, shows that \$1.0 billion of future water revenue bonds is needed to provide \$917 million for construction of SWP water system facilities and \$95 million for bond discounts, interest costs, and debt service reserve requirements.

Line 30, Subtotal, Water System Revenue Bonds, is the total of Lines 22 through 29.

Line 31, Initial Project Facilities Bond Proceeds, shows the amount of general obligation bonds sold to provide financing costs for initial SWP facilities and for costs of planning certain additional conservation facilities.

Financing initial facilities from general obligation bonds was completed in mid-1972 and totaled \$1.444 billion—\$1.750 billion Burns-Porter Act authorization less \$130 million reserved for the Davis-Grunsky Act Program and \$176 million "offset" for additional conservation facilities. (The Burns-Porter Act provides that to the extent California Water Fund monies are expended, an equal amount of general obligation bonds are reserved [offset] for financing the construction of additional conservation facilities in certain watersheds.)

In mid-1972, the reservation of offset bonds was effectively limited to \$176 million, the total amount of California Water Fund monies expended up to that time. By mid-1972, all general obligation bonds authorized by the Burns-Porter Act had been offset, reserved for the Davis-Grunsky Act Program, or used for SWP construction.

Approximately \$8.5 million of the offset bonds was used to finance planning studies of the Middle Fork Eel River Development. This financial analysis is not based on the use of any offset bond proceeds to meet capital requirements. If, at some time, the State constructs an additional conservation facility, as specified in California Water Code Section 12938, the remaining offset bonds could be sold.

Line 32, Davis-Grunsky Act Program Bond Proceeds, shows, for simplification, the entire \$130 million of capital expenditures authorized for the Davis-Grunsky Act Program, according to the Burns-Porter Act, as being funded by proceeds from the sale of general obligation bonds. In fact, \$102 million originated from bond proceeds while \$28 million from the California Water Fund was used for the program in lieu of bond proceeds prior to 1969. Since the final offset in 1994, DWR has accumulated \$44.6 million in capital costs through fiscal year 2006–2007.

Line 33, Application of California Water Fund Monies, shows the amount of SWP costs financed under the Burns-Porter Act. The act provides that any available money in the California Water Fund must be used for construction in lieu of proceeds from the sale of general obligation bonds.

When the Burns-Porter Act became effective in late 1960, approximately \$97 million had been accumulated in the fund. That balance, plus subsequent appropriations, interest earnings, and other miscellaneous income to the fund through December 31, 2011, was used to finance a total of \$508 million of SWP costs.

Line 34, Interim Financing, shows the net annual amounts of funds flowing into and out of the Water Revenue Commercial Paper Notes program. This program was established in March 1993 to provide an ongoing source of interim financing for water system projects prior to permanent financing from the sale of long-term revenue bonds. DWR has authority to issue up to \$141.5 million of Water Revenue Commercial Paper Notes. A positive number indicates money borrowed from the program to finance construction costs. A negative number indicates money repaid to the program. The financial analysis assumes that all funds borrowed from the program will be repaid before the end of the analysis period.

Line 35, Application of Capital Resources Revenues to Construction, presents the Capital Resources Revenues applied for capital expenditures.

Line 36, Revenue Transfers Applied, shows monies assumed to be transferred to the California Water Fund, according to provisions of the Burns-Porter Act, and subsequently reappropriated to construction (see Line 40 of Table 14-2). Projected amounts for the years 2012 through 2021 include funds to finance expenditures for agricultural drainage facilities, as indicated

in Line 13 of Table 14-1, and expenditures for additional conservation facilities, as indicated in Line 12.

Line 37, Subtotal, Other Capital Financing, is the total of Lines 31 through 36.

Line 38, Total Financing of Capital Requirements, totals Lines 21, 30, and 37.

Annual Revenues and Expenditures

After financial analysis of SWP operations, DWR concluded that projected payments by contractors and other revenues will be adequate to pay annual operations, maintenance, power, and replacement costs and meet all repayment obligations on funds used to finance SWP construction and other authorized costs during the period 2012 through 2021. Data on annual revenues and expenditures are presented in Table 14-2. A detailed discussion of each line item follows.

Project Revenues

Project revenues primarily consist of SWP water contractor payments required under their individual long-term water supply contracts. Those revenues are deposited in two funds: the Central Valley Water Project Revenue Fund, where all revenues pledged to revenue bonds are placed, and the California Water Resources Development Bond Fund—Systems Revenue Account, where all other SWP operating revenues are placed. Use of those funds is limited to paying operating costs and debt service; except that revenues in excess of those costs may be deposited to a reserve for future SWP construction, since the California Water Fund has been repaid (see Line 39).

Line 1, Capital Resources Revenues, includes the following:

- federal payments for SWP capital expenditures;

- appropriations for capital costs allocated to recreation;
- appropriations for SWP capital expenditures prior to passage of the Burns-Porter Act and according to Senate Bill 261 (1968);
- payments from Los Angeles Department of Water and Power for Castaic power development;
- advances from contractors for construction of requested work;
- investment earnings on the Capital Resources Account; and
- investment earnings on unexpended revenue bond proceeds.

Historically, appropriations for capital costs allocated to recreation and fish and wildlife enhancement have amounted to \$5 million per year and have been appropriated by the California Legislature from the State tideland oil revenues. There have been no appropriations since 1985, and no appropriations are indicated in the financial analysis for 2012 through 2021. Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see Line 39). Since the final offset in 1994, DWR has accumulated \$67.2 million in capital costs through fiscal year 2011–2012.

Lines 2 through 12, Water Contractor Payments, show amounts of the separate elements of water contractor payments.

Amounts in Line 4 also include revenues sufficient to cover costs associated with sales of excess power. Appendix B of this bulletin presents a detailed explanation of payments identified in Lines 2 through 12.

Operations, maintenance, power, and replacement (OMP&R) costs are repaid as they are incurred as part of the Transportation Charge; therefore, no interest

charges are included. Construction costs included in the Transportation Charge, and all construction and annual OMP&R costs included in the Delta Water Charge, are to be repaid with interest at the Project Interest Rate.

The Project Interest Rate, as defined in Article 1(r) of the standard provisions of the long-term water supply contracts, is the weighted average of the rates paid on certain securities issued and loans obtained to finance SWP facilities.

According to the original water supply contract provisions, the basis for determining the Project Interest Rate was the weighted average of rates paid on general obligation bond sales only. In 1969, after Oroville Revenue Bonds were issued, the contracts were amended to expand the basis to include rates on all other securities sold and loans obtained thereafter for financing SWP facilities, including revenue bonds (see Bulletin 132-70, page 28).

However, not all proceeds from the sale of revenue bonds are melded into the calculation of the Project Interest Rate. Only those proceeds applied to construction costs (the only application of general obligation bonds permitted by law) and those consumed by the bond discount (a component of the total interest cost of a revenue bond issue) are included in the calculation (see Table 14-8).

Calculations for determining the Project Interest Rate do not include proceeds from the sale of revenue bonds for Off-Aqueduct Power facilities, the East Branch Enlargement facilities, SBA, or water system facilities defined in the Water Revenue Bond Amendment. Table 14-9 lists all bond sales by date and presents basic information used in the calculation of the Project Interest Rate.

Information about contractor water charges in Appendix B, which can be found in the

Table 14-8 Revenue Bond Proceeds Affecting Project Interest Rate (in millions of dollars)

Project	Proceeds Included in Project Interest Rate				Total Principal Amount of Bonds	Percentage of Total Amount Included in Calculating Project Interest Rate [4] / [5]
	Applied to Construction Costs	Less Portion of Proceeds Derived from Interest Earnings Prior to Delivery of Bonds	Plus Bond Financing and Refunding Costs	Subtotal, Proceeds Included in Calculating Project Interest Rate [1] - [2] + [3]		
	[1]	[2]	[3]	[4]	[5]	[6]
Devil Canyon-Castaic Project Revenue Bonds	125.3	1.5	1.4	125.2	139.2	90
Pyramid Project Revenue Bonds (Series A)	71.2	0.5	1.1	71.8	95.8	75
Alamo Project Bond Anticipation Note	16.8	0.1	0.3	17.0	24.4	70
Small Hydro Project I Revenue Bonds (Series D)	25.4	0.2	1.5	26.7	37.5	71
Alamo Project Revenue Bonds (Series F)	38.9	0.3	0.7	39.3	50.0	79
Power Facilities Revenue Bonds (Series H)						
Pyramid Project	5.0	0.0	0.1	5.1	5.1	100
Alamo Project	1.7	0.0	0.0	1.7	1.7	100
Small Hydro Project I	25.2 ^a	0.2	0.4	25.4	35.6	71
Water System Revenue Bonds (Series J)						
Pyramid Project	0.0	0.0	75.9 ^b	75.9	99.2 ^b	77
Alamo Project	0.0	0.0	45.6 ^b	45.6	57.1 ^b	80
Small Hydro Project I	0.0	0.0	27.8 ^b	27.8	38.8 ^b	72
Water System Revenue Bonds (Series L)						
Small Hydro Project I	0.0	0.0	1.5 ^b	1.5	2.1 ^b	71
Water System Revenue Bonds (Series Q)						
Pyramid Project	0.0	0.0	3.0 ^b	3.0	3.9 ^b	77
Alamo Project	0.0	0.0	4.8 ^b	4.8	6.0 ^b	80
Water System Revenue Bonds (Series S)						
Pyramid Project	0.0	0.0	8.0 ^b	8.0	10.4 ^b	77
Alamo Project	0.0	0.0	7.6 ^b	7.6	9.5 ^b	80
Water System Revenue Bonds (Series U)						
Pyramid Project	0.0	0.0	2.4 ^b	2.4	3.2 ^b	75
Alamo Project	0.0	0.0	3.2 ^b	3.2	4.0 ^b	80
Water System Revenue Bonds (Series W)						
Pyramid Project	0.0	0.0	27.7 ^b	27.7	36.0 ^b	77
Alamo Project	0.0	0.0	11.8 ^b	11.8	14.7 ^b	80
Small Hydro Project (construction)	3.4	0.0	0.0	3.4	3.7	92
Small Hydro Project (refunding)	0.0	0.0	16.3 ^b	16.3	22.7 ^b	72
Water System Revenue Bonds (Series X)						
Pyramid Project	0.0	0.0	8.5 ^b	8.5	11.0 ^b	77
Alamo Project (Series H refunding)	0.0	0.0	0.3 ^b	0.3	0.3 ^b	100
Alamo Project (Series F refunding)	0.0	0.0	3.9 ^b	3.9	4.9 ^b	79
Small Hydro Project	0.0	0.0	4.6 ^b	4.6	6.4 ^b	72

^a Amount consists of 71 percent of proceeds deposited in escrow to refund portion of Series D bonds (\$35.1 million plus deposits to construction account [\$0.3 million]).

^b Represents amount of principal used to refund portions of prior bond issuances.

back of this bulletin, is based on known conditions and substantiates DWR's determination of 2013 water charges to be billed on July 1, 2012. However, information about significant differences between the sum of future charges included in Lines 2 through 12 of Table 14-2 and the substantiation of 2013 charges included in Appendix B are as follows.

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 2011. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-2012 charges in Appendix B represent charges as they should have been, according to currently known conditions. Pre-2012 charges included in Table 14-2 are those actually paid as part of previously determined bills.
- Charges in Appendix B are unadjusted for past overpayments or underpayments. Charges included in Table 14-2 for 2012 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-2012 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch Enlargement share of the Series A through Series AJ bonds. Charges in Table 14-2 apply to Series A through Series AJ bonds and also include amounts of the debt service and cover for assumed future bonds.
- The water revenue bond surcharge in Appendix B applies only to the Series B through Series AJ bonds. Surcharge values included in Table 14-2 apply to Series B through Series AJ bonds and to assumed future issues required to finance SWP construction costs included in Table 14-1.

Line 13, Subtotal, Water Contractor Payments, is the total of Lines 2 through 12.

Line 14, Revenue Bond Cover Adjustments, represents the credit to contractors resulting from the cover of 25 percent of the annual debt service for Power Facilities Revenue Bonds and Water System Revenue Bonds. Cover is collected as required by the bond resolutions to provide security to the bondholders. If not needed to meet annual bond service, the cover is credited to the contractors in the following year. The annual charges for the following cost components include an amount for bond cover:

- minimum OMP&R component of the Transportation Charge for Off-Aqueduct Power Facilities;
- Water System Revenue Bond Surcharge;
- capital cost component of the Transportation Charge for East Branch Enlargement Facilities;
- capital cost component of the Transportation Charge for Coastal Branch Extension Facilities;
- capital cost component of the Transportation Charge for East Branch Extension Facilities;
- capital cost component of the Transportation Charge for Tehachapi Afterbay; and
- capital cost component of the Transportation Charge for SBA Enlargement.

Line 15, Rate Management Adjustments, shows the projected amount of revenue reductions allocated to contractors after repayment of the California Water Fund (see Line 39). Under provisions of the Monterey Amendment, the reduction amount allocated to agricultural contractors is deposited into a trust fund to stabilize payments in water-short years. The urban contractor allocation is applied as a direct reduction in charges.

Line 16, Federal Payments for Project Operating Costs, shows federal payments made in accordance with the December 31, 1961, agreement between California and

Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale

Bond Sales	Date of Sale	Dollar-Years ^a (thousands)	Interest Cost (thousands)	Issue Interest Rate ^b (percent)	Project Interest Rate ^c (percent)
\$ 50,000,000 Bond Anticipation Notes	11/21/63	26,944	531	1.971	1.971
\$100,000,000 Series A Water Bonds	2/18/64	3,402,000	119,750	3.520	3.508
\$ 50,000,000 Series B Water Bonds	5/05/64	1,726,000	60,986	3.533	3.516
\$100,000,000 Series C Water Bonds	10/07/64	3,452,000	123,764	3.585	3.544
\$100,000,000 Series D Water Bonds	2/16/65	3,497,900	122,403	3.499	3.531
\$100,000,000 Series E Water Bonds	11/23/65	3,497,900	130,029	3.717	3.573
\$100,000,000 Series F Water Bonds	6/08/66	3,497,900	137,359	3.927	3.638
\$100,000,000 Series G Water Bonds	11/22/66	3,497,900	143,788	4.111	3.711
\$100,000,000 Series H Water Bonds	3/21/67	3,497,900	129,261	3.695	3.709
\$100,000,000 Series J Water Bonds	7/18/67	3,497,900	143,199	4.094	3.754
\$100,000,000 Series K Water Bonds	11/14/67	3,497,900	163,887	4.685	3.853
\$150,000,000 Revenue Bonds, Oroville Division, Series A	4/03/68	5,228,700	270,289	5.169	
\$100,000,000 Series L Water Bonds	7/11/68	3,497,900	166,918	4.772	3.941
\$100,000,000 Series M Water Bonds	10/22/68	3,497,900	169,989	4.860	4.021
\$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/01/69	3,423,460	195,902	5.722	
\$ 46,761,000 Cumulative 1970 General Fund Borrowing, repaid 7/10/70	-	4,938	346	7.007	
\$200,000,000 Series N and P Bond Anticipation Notes	6/16/70	200,000	11,660	5.830	4.030
\$100,000,000 Series N Water Bonds	2/02/71	3,447,900	190,292	5.519	4.148
\$100,000,000 Series Q Bond Anticipation Notes	3/10/71	100,000	2,349	2.349	4.143
\$100,000,000 Series P Water Bonds	4/21/71	3,397,900	193,377	5.691	4.255
\$150,000,000 Series Q and R Water Bonds	11/09/71	5,171,850	265,734	5.138	4.342
\$ 40,000,000 Series S Water Bonds	3/28/72	1,399,160	76,509	5.468	4.371
\$139,165,000 Devil Canyon-Castaic Revenue Bonds	8/08/72	4,776,204	258,839	5.419	4.457
\$ 10,000,000 Series T Water Bonds	3/20/73	185,265	9,491	5.123	4.459
\$ 10,000,000 Series U Water Bonds	1/13/76	158,750	8,731	5.500	4.462
\$ 10,000,000 Series V Water Bonds	11/15/77	158,750	7,573	4.770	4.462
\$ 95,800,000 Pyramid Hydroelectric Revenue Bonds	10/23/79	2,260,072	172,495	7.632	4.584
\$150,000,000 Reid Gardner Project, Series A Bond Anticipation Notes	7/1/81	347,906	29,572	8.500	
\$ 75,600,000 Bottle Rock Project, Bond Anticipation Notes	12/1/81	264,600	25,137	9.500	
\$ 24,400,000 Alamo Project, Bond Anticipation Notes	12/1/81	24,266	2,305	9.499	4.589
\$200,000,000 Reid Gardner Project, Series B Revenue Bonds	7/07/82	4,623,137	553,793	11.979	
\$125,000,000 Reid Gardner Project, Series C Revenue Bonds	11/16/82	2,720,045	255,744	9.402	
\$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds	11/16/82	837,769	84,587	10.097	4.666
\$ 37,500,000 South Geysers Project, Series D Revenue Bonds	11/16/82	930,325	90,021	9.676	
\$125,000,000 Bottle Rock Project, Series E Revenue Bonds	4/27/83	2,624,805	225,102	8.576	
\$ 50,000,000 Alamo Project, Series F Revenue Bonds	4/27/83	1,190,763	100,836	8.468	4.727
\$ 25,000,000 South Geysers Project, Series F Revenue Bonds	4/27/83	608,550	52,578	8.640	
\$239,505,000 Reid Gardner Project, Series G Revenue Bonds	3/15/85	4,524,136	425,840	9.413	
\$206,690,000 Power Facilities Series H Revenue Bonds	6/20/86	4,430,520	347,745	7.849	4.713
\$132,000,000 East Branch Enlargement, Series A Water System Revenue Bonds	7/15/86	3,427,165	254,915	7.438	

Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale

Bond Sales	Date of Sale	Dollar-Years ^a (thousands)	Interest Cost (thousands)	Issue Interest Rate ^b (percent)	Project Interest Rate ^c (percent)
\$100,000,000 Series B Water System Revenue Bonds	5/05/87	2,564,012	194,817	7.598	
\$ 9,000,000 Series C Water System Revenue Bonds	12/01/87	324,000	31,995	9.875	
\$100,000,000 Series D Water System Revenue Bonds	6/14/88	2,640,510	201,253	7.622	
\$ 9,000,000 Series E Water System Revenue Bonds	11/29/88	324,000	31,995	9.875	
\$160,030,000 Series F Water System Revenue Bonds	3/15/89	2,779,838	189,261	6.808	
\$100,000,000 Series G Water System Revenue Bonds	3/06/90	2,434,175	172,277	7.077	
\$100,000,000 Series H Water System Revenue Bonds	1/10/91	2,459,172	168,857	6.866	
\$180,000,000 Series I Water System Revenue Bonds	5/14/91	4,366,680	294,090	6.735	
\$649,835,000 Series J Water System Revenue Bonds	1/16/92	12,422,222	745,198	5.999	
\$100,000,000 Series K Water System Revenue Bonds	5/12/92	2,366,783	147,064	6.214	
\$ 9,000,000 Series W Water Bonds	8/19/92	95,250	6,172	6.480	4.621
\$537,830,000 Series L Water System Revenue Bonds	5/19/93	11,414,859	640,518	5.611	4.620
\$ 2,000,000 Series X Water Bonds	9/01/93	26,000	1,247	4.796	4.621
\$ 1,400,000 Series Y Water Bonds	11/30/94	19,483	1,249	6.411	
\$190,000,000 Series M Water System Revenue Bonds	12/19/93	3,911,846	194,981	4.984	
\$152,000,000 Series N Water System Revenue Bonds	3/03/95	2,241,606	122,658	5.472	
\$335,000,000 Series O Water System Revenue Bonds	12/05/95	7,528,890	375,667	4.990	
\$160,000,000 Series P Water System Revenue Bonds	5/07/96	3,553,823	204,524	5.755	
\$266,630,000 Series Q Water System Revenue Bonds	11/05/96	5,481,815	299,846	5.470	4.620
\$ 20,700,000 Series R Water System Revenue Bonds	3/10/97	564,125	36,627	6.493	
\$200,205,000 Series S Water System Revenue Bonds	8/04/97	4,093,110	203,755	4.978	4.615
\$135,665,000 Series T Water System Revenue Bonds	8/04/97	1,310,620	66,942	5.108	
\$207,180,000 Series U Water System Revenue Bonds	12/01/98	4,032,075	200,758	4.979	
\$ 20,580,000 Series V Water System Revenue Bonds	12/01/98	525,100	32,819	6.250	
\$260,995,000 Series W Water System Revenue Bonds	5/01/01	3,659,312	195,822	5.351	4.613
\$160,225,000 Series X Water System Revenue Bonds	5/01/02	2,732,785	139,109	5.090	4.610
\$329,885,000 Series Y Water System Revenue Bonds	7/05/02	4,422,973	222,654	5.034	
\$170,655,000 Series Z Water System Revenue Bonds	10/02/02	1,706,132	75,696	4.437	
\$108,705,000 Series AA Water System Revenue Bonds	10/04/02	2,114,341	104,220	4.929	
\$189,625,000 Series AB Water System Revenue Bonds	3/09/04	4,344,942	173,788	4.000	
\$272,070,000 Series AC Water System Revenue Bonds	12/15/04	4,479,436	209,150	4.669	
\$112,390,000 Series AD Water System Revenue Bonds	6/14/05	1,827,449	90,461	4.950	4.608
\$632,890,000 Series AE Water System Revenue Bonds	5/1/08	8,884,000	436,216	4.910	
\$287,735,000 Series AF Water System Revenue Bonds	11/17/09	2,980,895	431,199	14.465	
\$169,115,000 Series AG Water System Revenue Bonds	3/10/09	2,907,605	311,889	10.727	
\$ 97,675,000 Series AH Water System Revenue Bonds	11/9/10	1,432,014	72,176	5.040	4.610
\$ 92,275,000 Series AI Water System Revenue Bonds	9/7/11	698,716	34,936	5.000	
\$216,930,000 Series AJ Water System Revenue Bonds	10/13/11	2,080,429	100,663	4.839	
Total		218,306,003	12,886,175		
Portion allocated to Project Interest Rate		63,903,487	2,945,789	4.610	4.610

^a A unit equivalent to one dollar of principal amount outstanding for one year.

^b The total interest cost (without regard to discounts paid or to premiums received) divided by the total dollar-years, expressed as a percent.

^c Determined by dividing cumulative interest costs by cumulative dollar-years, expressed as a percent. (Excluding Oroville Division bonds and revenue bonds for Off-Aqueduct Power Facilities, East Branch Enlargement Facilities, East Branch Extension Facilities, Water System Facilities as defined in the Water Revenue Bond Amendment, Coastal Extension Facilities, or South Bay Aqueduct Enlargement Facilities.)

the United States providing for DWR to operate and maintain the San Luis Joint-Use Facilities. According to the January 12, 1972, supplement to the agreement, the Bureau of Reclamation (Reclamation) initially paid 45 percent of operations, maintenance, and replacement (OM&R) costs for those activities. (The percentage does not apply to power costs; Reclamation and DWR each provide their own power to pump water through the joint facilities.)

The percentage paid by Reclamation is periodically reviewed by Reclamation and DWR. The most recent review of the percentage paid by Reclamation was completed in 1987 and resulted in a federal share of 44.09 percent. The amounts in Line 16 are based on the assumption that the federal share will continue at this level for calendar years 2012 through 2021.

Line 17, Appropriations for Operating Costs Allocated to Recreation, shows appropriations made under the Davis-Dolwig Act. In passing the Davis-Dolwig Act, the California Legislature declared its intent that, except for funds provided according to Assembly Bill 12 (1966), DWR's budget will include appropriations of monies from the General Fund necessary for enhancement of fish and wildlife and recreation in connection with State water projects.

Annual OMP&R costs allocated to recreation and fish and wildlife enhancement are to be paid by annual appropriations from the General Fund. Through fiscal year 1982–1983, these appropriations totaled \$16.657 million. There have been no additional appropriations since the 1982–1983 fiscal year and none are indicated for 2012 through 2021.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and to fish and wildlife enhancement against the amount the SWP owed to the California

Water Fund (see line 39). Since the final offset in 1994, DWR has accumulated \$199.3 million in OMP&R costs through fiscal year 2011–2012.

Line 18, Davis-Grunsky Loan Repayments, shows the repayments by local agencies of \$69.3 million of loans disbursed as of December 31, 2011. Repayment on any future loans was assumed to be beyond the period covered by the financial analysis.

Line 19, Revenue Bond Proceeds, includes bond proceeds classified as special reserves according to the description of revenue bond financing in Line 17 of Table 14-1. Those proceeds, used for capitalized OMP&R costs, revenue bond debt service, and debt service reserves, are not classified as revenue but are included in this line to simplify the financial presentation.

Line 20, Interest Earnings on Operating Revenues, includes interest earnings on unexpended proceeds from the sale of general obligation bonds, interest on operating reserves, and other short-term investment earnings on SWP revenues.

Line 21, Oroville-Thermalito Payments, shows payments from Pacific Gas & Electric Company, Southern California Edison, and San Diego Gas & Electric Company for power generation at the Oroville facilities. Those utilities purchased all power generation from Hyatt and Thermalito powerplants before April 1, 1983, in accordance with a power sale contract dated November 29, 1967. The historic amount includes the amounts of final settlement of payments made according to the contract.

Line 22, Miscellaneous Revenues, includes all other operating revenues not included in Lines 2 through 21.

Line 23, Subtotal, Other Revenues, is the total of Lines 16 through 22.

Line 24, Total Operating Revenues, is the total of Lines 13, 14, 15, and 23.

Line 25, Total Operating Revenues and Capital Resources Revenues, is the total of Lines 1 and 24.

Project Expenses

Project expenses include the following:

- operations, maintenance, and power costs;
- deposits to replacement reserves;
- deposits to special reserves;
- capital resources expenditures; and
- debt service.

Revenue bond proceeds earmarked for debt service during construction and the first year's operating expenses are deposited in the Central Valley Water Project Construction Fund and disbursed in accordance with resolutions authorizing the issuance of such bonds.

Water contractor revenues associated with operating costs and debt service attributable to projects financed by revenue bonds are deposited in the Central Valley Water Project Revenue Fund for appropriate disbursement. All other operating revenues are deposited in the California Water Resources Development Bond Fund—Systems Revenue Account and are disbursed in accordance with the following four priorities of use, as specified in the Burns-Porter Act:

- SWP OMP&R costs;
- general obligation bond debt service;
- repayment of expenditures from the California Water Fund; and
- deposits to a reserve for future SWP construction.

Project expenses are presented in Lines 26 through 36 of Table 14-2.

Line 26, Project Operations, Maintenance, Power, and Replacement Costs, shows the OMP&R portion of the historical and projected costs presented in Table 14-10.

Table 14-10 and Line 26 of Table 14-2 also include the amounts of the operations and maintenance costs for the federal share of joint facilities and those OMP&R costs allocated to recreation, which are intended to be offset by revenues listed in Lines 16 and 17.

Allowances for cost escalations are included in OMP&R costs through 2012. Allowances for additional long-term price escalations in the future are not included in these estimates, because changes in OMP&R costs do not substantially affect the overall results of the financial analysis. (For the most part, changes in OMP&R costs cause direct offsetting changes in operating revenues.)

Power costs make up the largest component of annual operating expenses for the SWP. Assumptions about future power sources and costs are discussed in Chapter 10, Power Resources. Line 26 also includes costs associated with power transactions that result in the sale of power not required for the delivery of water.

Line 27, Deposits to Replacement Reserves, shows funds set aside as required by contract for replacing existing SWP facilities. By December 31, 2011, \$139.2 million had been spent for replacement costs; the balance of the replacement reserve as of that date was \$30.1 million.

Line 28, Deposits to Special Reserves Under Revenue Bond Financing, includes two significant components: special reserve deposits related to revenue bonds and capital resources revenue carryover from prior years used for construction in the current year. Special reserve deposits are the

Table 14-10 Operations, Maintenance, Power, and Replacement Costs, by Facility, Composition, and Purpose (in thousands of dollars)

Feature	Calendar Year												TOTAL
	1962-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022-2035	
Project Facility													
Feather River facilities	1,359,842	61,129	64,456	64,209	65,408	65,944	66,403	67,168	67,758	68,470	69,138	1,063,037	3,082,962
North Bay Aqueduct	86,623	7,774	7,368	7,006	5,820	5,983	6,022	6,390	6,436	6,493	6,545	99,421	251,881
Delta facilities	762,855	60,542	64,207	58,234	53,556	53,995	54,370	54,996	53,416	53,978	50,293	773,294	2,093,736
Suisun Marsh	44,336	2,499	2,279	2,258	2,356	2,375	2,391	2,419	2,440	2,466	2,490	38,283	106,592
South Bay Aqueduct	326,558	13,598	14,297	13,806	13,234	13,291	13,448	13,551	13,617	13,708	13,789	206,148	669,045
California Aqueduct													
Delta to Edmonston	3,973,881	196,056	227,163	215,229	183,832	190,121	187,201	200,842	197,418	203,285	201,672	2,973,529	8,950,230
Edmonston to Perris	3,405,380	196,908	214,338	212,578	189,131	202,368	197,543	226,918	210,143	222,380	216,237	3,222,220	8,716,144
West Branch	59,319	12,998	11,710	12,159	13,784	13,338	12,405	14,599	10,173	9,082	10,711	226,311	406,589
Coastal Branch	278,272	19,716	17,181	16,494	16,595	16,688	16,761	17,864	17,969	18,105	18,229	274,423	728,297
East Branch Enlargement	112,542	6,690	8,112	6,300	6,804	6,792	6,772	6,782	6,774	6,777	6,776	96,610	277,731
Off-Aqueduct power-generating facilities	1,495,461	69,374	23,866	123	126	8	8	8	8	9	9	71	1,589,071
Recreation, planning, and CVP negotiations	6,692	679	679	679	679	679	679	679	679	679	679	9,506	22,988
Water quality monitoring	424,976	12,683	12,683	12,683	12,683	11,379	11,379	11,379	11,379	11,379	11,379	159,306	703,288
Davis-Grunsky Act Program	5,330	278	270	260	260	260	260	260	260	260	260	3,640	11,598
<i>Subtotal</i>	<i>12,342,067</i>	<i>660,924</i>	<i>668,609</i>	<i>622,018</i>	<i>564,268</i>	<i>583,221</i>	<i>575,642</i>	<i>623,855</i>	<i>598,470</i>	<i>617,071</i>	<i>608,207</i>	<i>9,145,799</i>	<i>27,610,152</i>
Payments to/credits from PG&E under Comprehensive Agreement (59,848)	0	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Total OMP&R Costs	12,282,219	660,924	668,609	622,018	564,268	583,221	575,642	623,855	598,470	617,071	608,207	9,145,799	27,550,304
Composition													
Salaries and expenses of headquarters personnel	3,638,657	146,904	165,003	131,343	135,321	117,374	113,038	122,382	114,910	118,734	118,024	1,288,576	6,210,266
Salaries and expenses of field personnel	5,043,763	188,721	212,471	171,213	176,243	204,170	196,121	213,122	199,269	206,204	205,064	2,249,707	9,266,068
Pumping power													
Used by pumping plants	2,763,709	297,783	334,796	363,959	292,487	306,487	311,274	336,978	333,252	342,654	333,877	4,718,036	10,735,293
Produced by generation plants	(478,115)	(42,135)	(44,061)	(44,900)	(40,068)	(45,095)	(45,076)	(48,912)	(49,247)	(50,807)	(49,044)	(703,559)	(1,641,019)
Payments to/credits from PG&E under Comprehensive Agreement (59,848)	0	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Off-Aqueduct power generating facilities requirement	1,482,399	69,374	123	126	8	8	8	8	9	9	9	1,589,161	3,141,242
Oroville-Thermalto insurance premiums	12,705	277	277	277	277	277	277	277	277	277	277	3,878	19,353
Less portion of costs incurred during construction (121,051)	(121,051)	0	0	0	0	0	0	0	0	0	0	0	(121,051)
Total OMP&R Costs	12,282,219	660,924	668,609	622,018	564,268	583,221	575,642	623,855	598,470	617,071	608,207	9,145,799	27,550,304
Project Purpose													
Water supply and power generation	11,767,933	630,865	638,550	591,959	534,209	553,162	545,583	593,796	568,411	587,012	578,148	8,724,973	26,314,601
Payments to/credits from PG&E under Comprehensive Agreement (59,848)	0	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Recreation and fish and wildlife enhancement	221,688	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	154,000	485,688
Flood control	8,034	459	459	459	459	459	459	459	459	459	459	6,427	19,051
Miscellaneous purposes													
Federal share, San Luis and Delta facilities	330,306	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	252,000	762,306
Other (Davis-Grunsky, drainage, City of Los Angeles)	14,105	600	600	600	600	600	600	600	600	600	600	8,400	28,505
Total OMP&R Costs	12,282,219	660,924	668,609	622,018	564,268	583,221	575,642	623,855	598,470	617,071	608,207	9,145,799	27,550,304

net of several income and expenditure items. Income items related to revenue bonds are:

- proceeds set aside to pay bond interest during construction (capitalized interest);
- proceeds set aside for first year operating costs (capitalized operations and maintenance);
- water contractor payments or bond proceeds set aside for debt service reserves;
- water contractor payments for revenue bond cover requirements; and
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements.

The 1952–2011 column also includes advances to DWR’s revolving fund for working funds to purchase mobile equipment and to meet day-to-day operating expenses.

The expenditure items related to revenue bonds include:

- debt service cover payments returned to contractors;
- debt service reserve interest payments returned to contractors;
- surplus account funds returned to contractors or applied to meet expenses;
- total capitalized interest paid out; and
- total capitalized operations and maintenance paid out.

Special reserves, reduced over time as reserved amounts, are used for their respective purposes. The amount indicated each year in Line 28 reflects the change from the previous year. A negative number indicates a withdrawal of special reserves to meet expenses, while a positive number indicates a deposit.

Line 29, Capital Resources Expenditures, includes the amount of capital resources revenues applied to construction that is shown in Line 35 of Table 14-1. In

Table 14-2, these expenditures are funded out of withdrawals from the reserves in Line 28 and do not affect net revenues shown in Line 38.

Lines 30 and 31, Payment of Debt Service on Bonds Sold through December 31, 2011, show the total principal and interest payments, respectively, on bonds sold to date. Table 14-11, at the end of this chapter, summarizes payments on general obligation bonds (Series A through Y water bonds), power revenue bonds by project, and water system revenue bonds (Series A through AJ).

Lines 32 and 33, Payments on Projected Future Water Bonds, include the projected annual debt service amounts for future water revenue bonds included on Lines 23, 25, 27, and 29 of Table 14-1 for the East Branch Enlargement, East Branch Extension, SBA Enlargement, and other water system facilities. Assumptions about the service on these future bonds are that interest costs for the water revenue bonds average 4.0 percent; and that bonds are to be repaid by the end of the project repayment period (2035) or sooner, with maturities commencing in the year following the date of sale and with equal annual bond service for the principal repayment period.

Lines 34 and 35, Total Payments of Bond Debt Service, show the total of principal payments indicated on Lines 30 and 32, and the total of interest repayments indicated on Lines 31 and 33.

Line 36, Subtotal, Debt Service, is the total of Lines 34 and 35.

Line 37, Total Operating Expenses and Debt Service, is the total of Lines 26, 27, 28, 29, and 36.

Line 38, Net System Revenues, shows the annual amounts of revenues remaining after the payment of operating costs and bond debt service costs.

Line 39, *California Water Fund Repayment*, shows the total amount of repayments made to the California Water Fund to reimburse the fund for monies expended for construction of the State Water Resources Development System.

Repayment of the California Water Fund was completed in 1998. The \$508 million includes the \$306 million of repayments shown in Line 39 and the \$202 million of reimbursement that was credited to the SWP as offsets for recreation and fish and wildlife enhancement expenditures.

Line 40, *Revenues Used for Capital Expenditures*, includes the amounts required annually for financing scheduled capital expenditures. Revenues not needed for operating costs or debt services are available for financing SWP capital expenditures.

Future Costs of Water Service

Estimates of future water costs are useful to contractors for short-range and long-range planning of water needs, operations, and budgets. Unit water charges shown in Table 14-12 represent estimated costs of water delivery by service area for calendar years 2013 and 2018. The unit rates include costs of existing and future SWP facilities accounted for in Table 14-1 and Table 14-7. The unit water charges are based on the assumption that in 2013 and 2018, the SWP will be able to deliver the entire amount of water requested by each contractor. The unit water charges included in Table 14-12 are listed both as 2013 dollars and as escalated rates reflecting assumed future inflation of 2.5 percent per year through 2018.

Table 14-12 Estimated Unit Water Charges for 2013 and 2018, by Service Area (in dollars per acre-foot)

Service Area and Charge	2013	2018
	(in 2013 dollars)	(in 2018 dollars)
Feather River Area		
Capital; Operations, Maintenance, and Replacement (OM&R)	245	259
North Bay Area		
Capital; OM&R	369	418
Power	49	26
Total	418	444
South Bay Area		
Capital; OM&R	234	236
Power	67	53
Total	301	289
Coastal Area		
Capital; OM&R	1,043	1,181
Power	151	140
Total	1,194	1,321
San Joaquin Area		
Capital; OM&R	144	155
Power	36	27
Total	180	182
Southern California Area		
Capital; OM&R	295	318
Power	195	172
Total	490	490

Table 14-1 Capital Requirements and Financing, December 31, 2011 (in thousands of dollars)

Line Number/Item	Calendar Year												
	1952-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012-2021	1952-2021
Capital Requirements													
1. Initial Project Facilities	2,202,316	0	0	0	0	0	0	0	0	0	0	0	2,202,316
2. North Bay Aqueduct	106,848	3,014	2,744	8,296	13,105	86,000	161,000	113,000	20,274	0	0	407,433	514,281
3. Delta and Suisun Marsh Facilities	285,259	18,171	26,361	13,223	8,024	7,824	7,000	7,000	0	0	0	87,603	372,862
4. Final 4 Units at Banks Pumping Plant	43,673	0	0	0	0	0	0	0	0	0	0	0	43,673
5. Coastal Branch Aqueduct	508,705	0	0	0	0	0	0	0	0	0	0	0	508,705
6. West Branch Aqueduct	208,346	0	0	0	0	0	0	0	0	0	0	0	208,346
7. East Branch Enlargement	461,014	1,022	1,040	2,040	33,399	77,739	84,255	84,532	84,482	62,243	4,766	435,518	896,532
8. East Branch Improvements	364,844	2,509	1,885	250	0	0	0	0	0	0	0	4,644	369,488
9. East Branch Extension	169,013	54,784	96,880	57,938	0	0	0	0	0	0	0	209,602	378,615
10. South Bay Aqueduct Improvements and Enlargement	218,738	19,707	250	0	0	0	0	0	0	0	0	19,957	238,695
11. Power Generation and Transmission Facilities	720,437	0	0	0	0	0	0	0	0	0	0	0	720,437
12. Additional Conservation Facilities	159,298	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	31,700	190,998
13. Agricultural Drainage Facilities	80,037	2,419	1,935	1,617	757	757	757	757	757	757	757	11,270	91,307
14. Other Costs	408,506	74,954	66,048	118,077	57,874	0	0	0	0	0	0	316,951	725,457
15. <i>Subtotal, Project Construction Expenditures</i>	<i>5,937,034</i>	<i>179,749</i>	<i>200,313</i>	<i>204,611</i>	<i>116,328</i>	<i>175,490</i>	<i>256,182</i>	<i>208,459</i>	<i>108,683</i>	<i>66,170</i>	<i>8,693</i>	<i>1,524,678</i>	<i>7,461,712</i>
16. Davis-Grunsky Act Program Costs	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
17. Special Capital Requirements Under Revenue Bond Financing	591,404	27,307	19,797	21,764	11,106	18,583	25,184	22,646	8,868	6,534	500	162,289	753,693
18. Total Capital Requirements	6,658,438	207,056	220,110	226,375	127,434	194,073	281,366	231,105	117,551	72,704	9,193	1,686,967	8,345,405
19. Power Facilities Capital Requirements	720,437	0	0	0	0	0	0	0	0	0	0	0	720,437
20. Water Facilities Capital Requirements	5,938,001	207,056	220,110	226,375	127,434	194,073	281,366	231,105	117,551	72,704	9,193	1,686,967	7,624,968
Financing of Capital Requirements													
Power Facilities Revenue Bond Proceeds													
21. Power Facilities Revenue Bonds through Series H	1,162,458	0	0	0	0	0	0	0	0	0	0	0	1,162,458
Water System Revenue Bond Proceeds													
22. East Branch Enlargement, Current Bonds	473,603	0	0	0	0	0	0	0	0	0	0	0	473,603
23. East Branch Enlargement, Future Bonds	0	9,425	1,149	2,254	36,905	85,899	93,099	93,406	93,350	68,777	5,266	489,530	489,530
24. East Branch Extension, Current Bonds	193,092	0	0	0	0	0	0	0	0	0	0	0	193,092
25. East Branch Extension, Future Bonds	0	50,322	107,050	64,020	0	0	0	0	0	0	0	221,392	221,392
26. South Bay Aqueduct Enlargement, Current Bonds	180,018	0	0	0	0	0	0	0	0	0	0	0	180,018
27. South Bay Aqueduct Enlargement, Future Bonds	0	1,100	193	0	0	0	0	0	0	0	0	1,293	1,293
28. Water System Facilities, Current Bonds	1,814,693	0	0	0	0	0	0	0	0	0	0	0	1,814,693
29. Water System Facilities, Future Bonds	0	242,570	100,000	162,820	80,000	109,703	172,000	144,966	0	0	0	1,012,059	1,012,059
30. <i>Subtotal, Water System Revenue Bonds</i>	<i>2,661,407</i>	<i>303,417</i>	<i>208,392</i>	<i>229,094</i>	<i>116,905</i>	<i>195,602</i>	<i>265,099</i>	<i>238,372</i>	<i>93,350</i>	<i>68,777</i>	<i>5,266</i>	<i>1,724,274</i>	<i>4,385,680</i>
Other Capital Financing													
31. Initial Project Facilities Bond Proceeds	1,452,452	0	0	0	0	0	0	0	0	0	0	0	1,452,452
32. Davis-Grunsky Act Program Bond Proceeds	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
33. Application of CA Water Fund Monies (Tideland Oil Revenues)	508,056	0	0	0	0	0	0	0	0	0	0	0	508,056
34. Interim Financing	82,306	(100,861)	7,218	(7,218)	6,029	(6,029)	11,767	(11,767)	19,701	(573)	(573)	(82,306)	0
35. Application of Capital Resources Revenues to Construction	566,269	0	0	0	0	0	0	0	0	0	0	0	566,269
36. Revenue Transfers Applied	95,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	140,490
37. <i>Subtotal, Other Capital Financing</i>	<i>2,834,573</i>	<i>(96,361)</i>	<i>11,718</i>	<i>(2,718)</i>	<i>10,529</i>	<i>(1,529)</i>	<i>16,267</i>	<i>(7,267)</i>	<i>24,201</i>	<i>3,927</i>	<i>3,927</i>	<i>(37,306)</i>	<i>2,797,267</i>
38. Total Financing of Capital Requirements	6,658,438	207,056	220,110	226,375	127,434	194,073	281,366	231,105	117,551	72,704	9,193	1,686,968	8,345,405

Table 14-2 State Water Project Revenues and Expenditures, December 31, 2011 (in thousands of dollars)

Line Number/Item	Calendar Year												
	1952-2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2012-2021	1952-2021
PROJECT REVENUES													
1. Capital resources revenues	814,701	0	0	0	0	0	0	0	0	0	0	0	814,701
Water Contractor Payments													
2. Transportation capital	4,461,929	162,748	165,815	168,575	174,921	175,977	170,918	162,340	152,823	143,765	133,422	1,611,304	6,073,233
3. Transportation minimum	3,795,456	218,291	215,223	185,915	205,792	207,850	209,929	212,028	214,148	216,290	218,453	2,103,918	5,899,375
4. Transportation variable	5,262,616	240,336	275,040	302,885	223,190	241,608	232,322	277,170	250,777	266,024	258,004	2,567,356	7,829,973
5. Off-Aqueduct power facilities	2,930,230	139,100	73,637	19,939	11,689	10,034	9,677	3,968	3,947	4,247	6,184	282,421	3,212,651
6. Delta water charge	2,771,327	175,811	193,300	193,314	193,323	193,329	193,329	193,329	193,329	193,329	193,329	1,915,723	4,687,050
7. East Branch Enlargement	859,925	46,127	42,228	43,231	46,254	48,892	57,935	66,418	76,108	85,295	93,876	606,364	1,466,289
8. East Branch Extension	121,545	18,923	22,568	31,064	36,966	37,013	38,264	37,794	37,942	38,124	38,432	337,091	458,636
9. Coastal Extension	44,425	3,840	4,132	4,690	4,742	4,676	4,432	3,418	2,604	3,603	3,766	39,901	84,326
10. South Bay Aqueduct Improvements and Enlargement	35,085	15,592	16,688	16,698	16,696	16,702	16,693	16,685	16,688	16,698	16,690	165,830	200,914
11. Tehachapi East Afterbay	20,875	6,346	6,367	6,377	6,371	6,368	6,366	6,364	6,374	6,365	6,366	63,665	84,539
12. Water revenue bond surcharge	602,217	69,650	73,235	77,469	81,417	81,803	80,668	72,451	76,426	72,018	71,754	756,890	1,359,107
13. Subtotal, water contractor payments	20,905,630	1,096,765	1,088,232	1,050,156	1,001,361	1,024,251	1,020,533	1,051,966	1,031,169	1,045,756	1,040,275	10,450,463	31,356,093
14. Revenue bond cover adjustments	(785,521)	(54,848)	(51,631)	(51,211)	(52,286)	(52,887)	(54,363)	(51,738)	(55,706)	(55,405)	(58,500)	(538,575)	(1,324,097)
15. Rate management adjustments	(380,680)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(404,700)	(785,380)
Other Revenues													
16. Federal payments for project operating costs	344,015	22,909	22,909	22,909	22,909	22,909	22,909	22,909	22,909	22,909	22,909	229,086	573,101
17. Appropriations for operating costs allocated to recreation	16,657	0	0	0	0	0	0	0	0	0	0	0	16,657
18. Davis-Grunsky loan repayments	69,339	2,207	1,816	1,522	1,373	1,277	1,273	1,081	984	913	906	13,352	82,691
19. Revenue bond proceeds	652,977	0	0	0	0	0	0	0	0	0	0	0	652,977
20. Interest earnings on operating revenues	576,162	700	700	700	700	700	900	900	900	900	900	8,000	584,162
21. Oroville-Thermalito payments	249,279	0	0	0	0	0	0	0	0	0	0	0	249,279
22. Miscellaneous revenues	184,264	0	0	0	0	0	0	0	0	0	0	0	184,264
23. Subtotal, other revenues	2,092,693	25,816	25,425	25,131	24,981	24,886	25,081	24,890	24,793	24,722	24,714	250,438	2,343,131
24. Total operating revenues	21,832,122	1,027,262	1,021,556	983,606	933,586	955,779	950,781	984,648	959,785	974,603	966,020	9,757,626	31,589,747
25. Total operating revenues and capital resources revenues	22,646,823	1,027,262	1,021,556	983,606	933,586	955,779	950,781	984,648	959,785	974,603	966,020	9,757,626	32,404,448
PROJECT EXPENSES													
26. Project operations, maintenance, power, and replacement costs	12,282,219	660,924	668,609	622,018	564,268	583,220	575,641	623,853	598,469	617,069	608,204	6,122,275	18,404,495
27. Deposits to replacement reserves	136,587	0	0	0	0	0	0	0	0	0	0	0	136,587
28. Deposits to special reserves	453,478	44,012	28,973	36,351	34,683	39,079	36,779	37,297	20,822	16,910	20,539	315,446	768,924
29. Capital resources expenditures	686,932	0	0	0	0	0	0	0	0	0	0	0	686,932
Payments of Debt Service													
30. Principal repayments on bonds sold through December 31, 2011 (current bonds)	2,794,190	182,769	178,049	172,835	173,754	172,129	170,189	142,600	146,904	146,371	143,885	1,629,485	4,423,675
31. Interest on bonds sold through December 31, 2011 (current bonds)	5,887,660	130,900	121,999	114,057	106,206	98,074	90,002	81,787	74,886	67,538	60,489	945,938	6,833,598
32. Future water bond principal repayments	0	1,821	8,805	15,198	22,926	27,723	35,851	47,572	59,481	66,083	72,105	357,565	357,565
33. Future water bond interest payments	0	2,336	10,620	18,647	27,249	31,054	37,819	47,039	54,724	56,132	56,297	341,917	341,917
34. Total principal	2,794,190	184,590	186,854	188,033	196,680	199,852	206,040	190,172	206,385	212,454	215,990	1,987,050	4,781,240
35. Total interest	5,887,660	133,236	132,619	132,704	133,455	129,128	127,821	128,826	129,610	123,670	116,786	1,287,855	7,175,515
36. Subtotal, debt service	8,681,850	317,826	319,473	320,737	330,135	328,980	333,861	318,998	335,995	336,124	332,776	3,274,905	11,956,755
NET REVENUES													
37. Total Operating Expenses and Debt Service	22,241,067	1,022,762	1,017,056	979,106	929,086	951,279	946,281	980,148	955,285	970,103	961,520	9,712,626	31,953,693
38. Net system revenues	405,755	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	450,755
Application of Net System Revenues													
39. California Water Fund repayment	305,765	0	0	0	0	0	0	0	0	0	0	0	305,765
40. Revenues used for capital expenditures	99,990	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	144,990

Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2011 (in thousands of dollars)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds ^a		Pyramid Project Revenue Bonds ^b		Alamo Project Revenue Bonds ^b		Small Hydro Project Revenue Bonds ^b		Water System Facilities Water System Revenue Bonds ^c		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds ^{d,e}		South Geysers Project Revenue Bonds ^d		Bottle Rock Project Revenue Bonds ^d		East Branch Enlargement Project Water System Revenue Bonds ^d		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds ^d		South Bay Enlargement Facilities Water System Revenue Bonds ^d		Tehachapi East Afterbay Facilities Water System Revenue Bonds ^d		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
1964	0	3,333	0	0	0	0	0	0	0	0	0	0	0	0	3,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,333
1965	0	11,114	0	0	0	0	0	0	0	0	0	0	0	0	11,114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,114
1966	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,764
1967	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,911
1968	0	37,761	0	3,876	0	0	0	0	0	0	0	0	0	0	41,637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,637
1969	0	47,460	0	10,448	0	0	0	0	0	0	0	0	0	0	57,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,908
1970	0	53,290	0	13,145	0	0	0	0	0	0	0	0	0	0	66,435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,435
1971	0	63,035	0	13,145	0	0	0	0	0	0	0	0	0	0	76,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,180
1972	0	69,149	1,260	13,112	0	0	0	0	0	0	0	0	1,260	82,261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	82,261	
1973	1,200	69,347	1,330	13,042	0	0	0	0	0	0	0	0	2,530	82,389	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,097	
1974	3,000	69,533	1,400	12,969	0	0	0	0	0	0	0	0	4,400	82,502	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,400	90,210	
1975	5,000	69,366	1,475	12,893	0	0	0	0	0	0	0	0	6,475	82,259	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,475	89,967	
1976	7,000	69,657	1,555	12,811	0	0	0	0	0	0	0	0	8,555	82,468	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	90,176	
1977	10,200	69,298	1,635	12,727	0	0	0	0	0	0	0	0	11,835	82,025	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,733	
1978	12,700	69,286	5,775	12,537	0	0	0	0	0	0	0	0	18,475	81,823	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,531	
1979	13,650	68,660	11,585	12,275	0	0	0	0	0	0	0	0	25,235	80,935	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,643	
1980	16,050	67,941	3,265	11,739	0	7,900	0	0	0	0	0	0	19,315	87,580	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,288	
1981	18,050	67,078	4,885	11,444	0	7,292	0	0	0	0	0	0	22,935	85,814	0	7,708	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,834	
1982	19,250	66,130	17,920	10,968	0	7,292	0	0	0	0	0	0	37,170	84,390	0	7,708	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,445	
1983	20,520	65,111	21,110	10,147	0	7,292	0	2,449	0	3,727	0	0	41,630	88,726	900	7,708	0	35,719	0	4,777	0	6,017	0	0	0	0	0	0	0	0	42,530	142,947		
1984	21,785	64,036	10,005	9,013	640	7,292	0	4,198	0	3,727	0	0	32,430	88,266	955	7,647	0	35,719	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	33,385	147,594	
1985	22,555	62,892	12,700	8,628	675	7,238	0	4,198	0	3,727	0	0	35,930	86,683	1,010	7,583	9,425	27,209	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	46,365	137,437	
1986	23,830	61,705	11,435	7,859	715	7,377	0	4,263	0	3,537	0	0	35,980	84,741	1,070	7,515	3,805	32,882	0	5,516	1,240	10,315	0	4,021	0	0	0	0	0	0	42,095	144,990		
1987	25,495	60,452	11,715	7,188	790	7,513	265	4,329	0	3,348	0	4,952	38,265	87,782	1,135	7,442	4,860	32,605	0	5,386	1,305	10,253	0	9,651	0	0	0	0	0	0	45,565	153,119		
1988	26,770	59,120	6,685	6,664	830	7,447	280	4,314	345	3,348	710	11,037	35,620	91,930	1,205	7,366	5,065	32,295	580	5,521	1,390	10,849	995	9,875	0	0	0	0	0	0	44,855	157,836		
1989	28,145	57,790	33,705	5,513	875	7,378	295	4,298	365	3,328	1,148	14,373	64,533	92,680	1,275	7,284	7,820	27,557	709	5,646	1,565	11,592	1,078	10,104	0	0	0	0	0	0	76,980	154,863		
1990	29,385	56,436	10,385	4,301	930	7,305	320	4,279	405	3,304	1,227	15,555	42,652	95,180	1,355	7,198	6,675	29,781	761	5,596	1,678	11,491	1,134	10,048	0	0	0	0	0	0	54,255	159,294		
1991	30,365	55,034	12,055	3,922	980	7,227	335	4,257	430	3,276	2,129	17,569	46,294	101,285	1,435	7,107	7,170	29,302	818	5,535	1,791	11,376	1,197	16,856	0	0	0	0	0	0	58,705	171,461		
1992	31,745	54,193	14,135	2,985	2,395	5,308	1,260	3,086	960	2,553	5,108	28,412	55,603	96,537	1,520	7,010	8,950	27,188	1,934	4,136	4,575	7,942	2,583	22,241	0	0	0	0	0	0	75,165	165,054		
1993	33,390	52,670	13,755	2,237	1,525	5,688	755	3,300	445	2,640	4,576	29,965	54,446	96,500	1,610	6,907	8,820	26,953	901	4,256	3,264	8,385	3,040	21,428	0	0	0	0	0	0	72,081	164,429		
1994	35,075	51,231	35,225	934	1,580	5,634	780	3,274	695	2,569	5,910	38,223	79,265	101,865	1,705	6,799	77,105	26,273	1,588	4,072	3,374	8,270	4,567	20,752	0	0	0	0	0	0	167,604	168,031		
1995	36,280	49,703	0	0	1,635	5,570	805	3,242	745	2,536	8,064	37,879	47,529	98,930	1,810	6,684	5,420	19,230	1,695	4,004	3,521	8,133	4,979	20,499	0	0	0	0	0	0	64,954	157,480		
1996	37,520	48,024	0	0	2,320	5,486	1,055	3,203	3,135	2,464	10,459	58,171	54,489	117,348	1,920	6,561	49,465	18,130	3,043	3,908	3,682	7,974	4,771	23,240	0	0	0	0	0	0	117,370	177,161		
1997	37,215	46,365	0	0	1,695	5,274	875	3,073	585	2,283	14,375	67,909	54,745	124,904	2,035	6,432	7,515	15,255	1,825	3,696	3,861	7,741	6,300	23,702	0	1,981	0	76	0	0	76,281	183,787		
1998	37,295	44,736	0	0	1,770	5,237	910	3,059	625	2,258	16,755	68,584	57,355	123,874	2,155	6,295	5,045	16,144	1,935	3,637	4,030	7,509	6,760	23,966	0	1,829	0	229	0	0	77,280	183,483		
1999	38,220	43,132	0	0	1,845	5,141	960	3,004	680	2,229	18,701	68,086	60,406	121,592	2,285	6,160	9,310	11,660	2,081	3,549	4,240	7,319	7,518	25,032	0	1,808	65	2,930	0	0	85,905	180,050		
2000	39,510	41,469	0	0	1,925	5,045	1,010	2,955	610	2,197	19,536	66,900	62,591	118,566	2,420	6,040	9,870	11,194	1,950	3,448	4,470	7,097	8,974	24,651	0	1,808	915	2,928	0	0	91,190	175,732		
2001	40,600	39,751	0	0	2,250	4,949	1,155	2,902	780	2,272	20,945	66,417	65,730	116,291	2,565	5,912	10,365	10,758	2,045	3,344	4,720	6,855	9,425	24,188	0	2,131	950	2,889	0	0	95,800	172,368		
2002	41,740	37,984	0	0	2,460	4,619	1,280	2,758	950	2,192	23,918	63,126	70,348	110,679	2,720	5,773	11,185	10,010	2,225	3,074	5,265	6,323	9,817	23,099	335	2,311	1,245	3,481	0	0	103,140	164,750		
2003	43,590	36,159	0	0	2,500	4,429	1,315	2,671	940	2,110	23,441	60,465	71,786	105,834	2,885	5,626	2,135	9,313	2,335	2,889	5,445	5,938	9,988	18,479	245	2,310	1,105	4,278	0	0	95,924	154,667		
2004	45,730	34,244	0	0	2,500	4,291	1,330	2,598	970	2,059	26,396	58,988	76,926	102,180	3,055	5,470	2,210	9,214	2,425	2,758	5,610	5,633	9,883	20,583	220	2,298	2,045	4,747	0	91	102,374	153,029		
2005	46,985	32,242	0	0	2,727	4,097	1,461	2,487	1,327	1,987	23,064	58,061	75,564	98,																				

Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2011 (in thousands of dollars)

(continued)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds ^a		Pyramid Project Revenue Bonds ^b		Alamo Project Revenue Bonds ^b		Small Hydro Project Revenue Bonds ^b		Water System Facilities Water System Revenue Bonds ^c		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds ^{a,c}		South Geysers Project Revenue Bonds ^b		Bottle Rock Project Revenue Bonds ^b		East Branch Enlargement Project Water System Revenue Bonds ^c		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds ^c		South Bay Enlargement Facilities Water System Revenue Bonds ^c		Tehachapi East Afterbay Facilities Water System Revenue Bonds ^c		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2018	25,435	3,011	0	0	4,763	1,271	2,791	854	2,479	601	61,041	44,455	96,509	50,192	6,910	2,045	109	298	685	279	1,202	652	20,686	10,933	1,513	1,216	5,780	7,039	6,517	6,747	2,689	2,386	142,600	81,787
2019	16,975	1,804	0	0	4,470	1,033	2,714	715	2,169	477	71,801	41,497	98,129	45,526	7,325	1,682	114	294	733	245	1,232	591	22,632	9,940	942	1,140	6,151	6,764	6,820	6,447	2,826	2,257	146,904	74,886
2020	17,405	956	0	0	5,462	810	3,294	580	2,764	369	66,384	37,926	95,309	40,641	7,765	1,298	119	288	861	209	1,443	530	22,393	8,783	1,788	1,093	6,573	6,466	7,160	6,114	2,960	2,116	146,371	67,538
2021	8,595	318	0	0	2,779	537	1,733	415	1,253	231	72,893	34,636	87,253	36,137	8,230	890	1,077	282	970	165	2,451	457	24,162	7,682	2,008	1,004	7,120	6,141	7,506	5,763	3,108	1,968	143,885	60,489
2022	1,885	60	0	0	5,474	400	5,119	330	1,310	169	71,043	31,052	84,831	32,011	8,725	458	1,126	230	906	117	2,412	338	28,078	6,500	2,830	904	7,415	5,796	7,878	5,401	3,268	1,813	147,469	53,568
2023	85	7	0	0	1,113	127	590	75	690	103	77,622	27,511	80,100	27,823	0	0	620	173	586	72	1,997	215	20,951	5,260	2,036	763	7,535	5,426	8,251	5,016	3,429	1,649	125,505	46,397
2024	35	3	0	0	708	70	400	45	456	68	78,255	23,630	79,854	23,816	0	0	385	142	457	40	1,558	103	22,919	4,236	2,136	661	7,828	5,052	8,665	4,612	3,600	1,482	127,402	40,144
2025	0	0	0	0	144	35	102	25	169	45	74,040	19,639	74,455	19,744	0	0	147	122	60	15	59	14	27,964	3,102	1,710	555	7,969	4,663	9,087	4,183	3,773	1,303	125,224	33,701
2026	0	0	0	0	151	28	108	20	178	37	70,085	15,940	70,522	16,025	0	0	262	115	63	12	61	11	9,897	1,715	1,798	470	14,144	4,265	10,576	3,729	4,588	1,114	111,911	27,456
2027	0	0	0	0	405	20	289	14	267	28	81,531	12,447	82,492	12,509	0	0	337	102	170	8	165	8	10,668	1,232	1,814	380	18,192	3,558	11,680	3,201	5,148	885	130,666	21,883
2028	0	0	0	0	0	0	0	0	140	15	65,133	8,364	65,273	8,379	0	0	452	85	0	0	0	0	7,521	710	2,815	289	24,095	2,647	13,181	2,614	5,955	628	119,292	15,352
2029	0	0	0	0	0	0	0	0	149	8	74,243	5,102	74,392	5,110	0	0	472	62	0	0	0	0	2,779	371	2,976	148	25,138	1,441	13,804	1,952	6,238	330	125,799	9,414
2030	0	0	0	0	0	0	0	0	0	0	4,040	1,416	4,040	1,416	0	0	105	38	0	0	0	0	0	0	0	0	575	195	4,860	1,264	55	20	9,635	2,933
2031	0	0	0	0	0	0	0	0	0	0	4,255	1,211	4,255	1,211	0	0	110	33	0	0	0	0	0	0	0	605	167	5,105	1,022	60	17	10,135	2,450	
2032	0	0	0	0	0	0	0	0	0	0	4,470	993	4,470	993	0	0	120	27	0	0	0	0	0	0	0	635	136	5,355	767	60	14	10,640	1,937	
2033	0	0	0	0	0	0	0	0	0	0	4,700	763	4,700	763	0	0	125	21	0	0	0	0	0	0	0	665	105	3,080	498	65	11	8,635	1,398	
2034	0	0	0	0	0	0	0	0	0	0	4,945	521	4,945	521	0	0	130	14	0	0	0	0	0	0	0	695	71	3,240	341	70	8	9,080	955	
2035	0	0	0	0	0	0	0	0	0	0	5,200	267	5,200	267	0	0	140	7	0	0	0	0	0	0	0	730	37	3,405	175	75	4	9,550	490	
Total	1,582,400	2,386,523	244,995	246,522	107,648	197,855	60,652	102,457	49,264	82,655	1,655,820	1,848,496	3,700,779	4,864,508	139,165	283,872	448,769	570,966	74,417	116,586	156,800	229,140	494,123	627,467	42,891	49,131	190,027	175,512	179,821	129,078	67,824	46,618	5,494,616	7,092,878

^aPrincipal and interest schedule adjusted to reflect early redemption of bonds.
^bAllocated portions of Power Facilities Revenue Bonds and Water System Revenue Bonds.
^cInterest includes a minimum fee for Water System Revenue Bonds Series AB.



Chapter 15

SWP Education and Information

Albert and Einstein, DWR's two water safety mascots, were created to educate kids of all ages about how to stay water safe at State Water Project facilities.

Significant Events in 2011

In 2011, California received heavy rains and near-record snowfalls in a wet water year that replenished reservoirs and provided an abundant water supply. The State Water Project (SWP) provided 80 percent of its contractors' water deliveries during 2011, up by 30 percent from the 50 percent deliveries in 2010.

Recognizing the end of a 3-year drought, Governor Edmund G. Brown Jr., in March formally rescinded Governor Schwarzenegger's drought emergency declaration of 2008–2009. However, because of yearly variations in water availability, water officials stressed conservation. "California can quickly turn from wet to dry," reminded DWR Director Mark W. Cowin, "and we can't afford to forget the lessons of conservation that we learned in the 2007–2009 drought."

For its long-term water planning, DWR hosted a 2-day meeting in Sacramento in October to advance the process of preparing the *California Water Plan Update 2013*. In preparing this comprehensive report on California's water supply and demand, DWR relies on extensive input from water experts and the public. The California Water Plan updates are published at 5-year intervals.

Information for this chapter was provided by the Public Affairs Office.

The Department of Water Resources (DWR) Public Affairs Office (PAO) produces and distributes news and program information describing California's water resources, DWR, its mission, programs, and activities. PAO disseminates information by way of news releases, interviews, Internet posts, and publications. Other avenues include artwork, films, graphics, photography, public meetings, social media, and special events.

News Topics

Selected highlights below provide examples of PAO's 2011 outreach efforts related to DWR's water policy, programs, and activities.

Snow Surveys

DWR experts conduct five monthly Sierra snow surveys, ending in late April or early May, when snowpack typically is at its peak. By analyzing snow depth and water content, experts gauge the Sierra snowpack's potential for producing snowmelt runoff for water use. Typically, Sierra snowpack produces about one-third of California's annual water supply.

DWR promotes media coverage of its monthly snow surveys to help inform water agency managers and educate the public about snowpack conditions and water supply prospects. In 2011, the monthly surveys received extensive coverage because heavy precipitation produced an increased estimate of water availability. The Sierra snowpack improved after the relatively dry years of 2007, 2008, and 2009.

Winter precipitation started at 195 percent of average for December. Though January was relatively light, succeeding months resumed a wet and snowy pattern that enabled DWR to gradually boost its State Water Project (SWP) supply projections as the season progressed. DWR's final snow survey showed that snowpack water content statewide was at 144 percent of the April 1 full season average.

SWP Allocations

DWR's first estimate for 2011 was that it could deliver 25 percent of requests. That estimate rose to 50 percent with the December snowstorms. After the final snow survey data was analyzed, DWR announced it would deliver 80 percent of requested SWP water in 2011.

In 2010, the SWP delivered 50 percent of water contractors' requests. In the three prior dry years, SWP deliveries were 60 percent in 2007, 35 percent in 2008, and 40 percent in 2009.

Climate Change

Climate change topics are key elements in preparation of the *California Water Plan Update 2013*. An initial meeting to launch research and expert input for this report was held in October.

In December, DWR joined with other leading water agencies, including the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers, to publish the *Climate Change Handbook for Regional Water Planning*. The handbook provides guidance and technical advice for water managers dealing with the impacts of climate change. DWR also presented a climate change exhibit in Long Beach in October.

SWP Publications

DWR maintains approximately 40 brochures describing the SWP, its mission, and facilities. The brochures are periodically issued in updated versions and distributed statewide to educate the public about the SWP.

E-News

PAO compiles and electronically distributes news articles and commentaries on water related issues. These news clips inform DWR managers and staff of water issues relevant to DWR and its programs.

DWR—A Magazine from DWR

This magazine (formerly *DWR News/People*) contains articles highlighting DWR programs and employees. The magazine is available in electronic and hardcopy format.

In the Winter 2010–2011 issue, the magazine profiled DWR’s Delta Field Division, which includes the SWP’s Banks Pumping Plant and the northernmost stretch of the California Aqueduct. Another major feature described the growth and functions of the Solano County Water Agency, an SWP long-term contractor that is served by the North Bay Aqueduct. Other stories described research efforts by DWR’s consulting firm, RNT Consulting, Inc., to help safeguard the SWP from invasive mussels, and DWR’s role in a multiagency effort to restore flows and fish populations to the San Joaquin River, California’s second-longest river.

In the Spring/Summer 2011 issue, the magazine focused on the 10-year anniversary of DWR’s California Energy Resources Scheduling Division, created to help solve a 2001 electrical energy crisis and prevent a statewide blackout. This edition also featured an article entitled *The Rains Have Come Back*, in which veteran DWR hydrologist Maury Roos analyzed California’s water supply recovery in water year 2011.

Another story profiled DWR’s Oroville Field Division, home of Oroville Dam, the tallest earth-filled dam in the nation, and Lake Oroville, the largest storage reservoir in the SWP. The cover story reported on the progress of the East Branch Extension of the California Aqueduct.

The Fall 2011 issue featured an article about DWR’s Southern Region Office, part of the Division of Integrated Regional Water Management. The Fall issue also profiled the Santa Clara Valley Water District, and the Save Our Water program, which won two awards in 2011, one from the National Association of Government Communicators and one from the International Association of Business Communicators.

DWR Tours Program

During 2011, DWR welcomed 22 foreign tours with 182 visitors to DWR’s Headquarters and SWP facilities. Tour groups came from throughout the United States and 16 foreign countries, including Canada, Chile, China, Egypt, Israel, Japan, Macedonia, the Netherlands, Russia, and South Korea.

There were also a number of domestic and school tours as follows:

- Oroville Field Division hosted 82 groups with 1,848 participants;
- Delta Field Division had 21 bus tours;
- Romero Overlook Visitors Center hosted 47 tour groups (16 foreign) with 1,414 participants;
- San Joaquin Field Division had one bus tour at the facilities;
- Southern Region Office hosted 15 tour groups with 173 participants; and
- Vista del Lago Visitors Center welcomed 24 tour groups (6 foreign) totaling 763 participants.

In addition, there were seven employee and nine nonemployee van tours of the Delta and Oroville field divisions. Figure 15-1 shows the SWP visitors center locations.

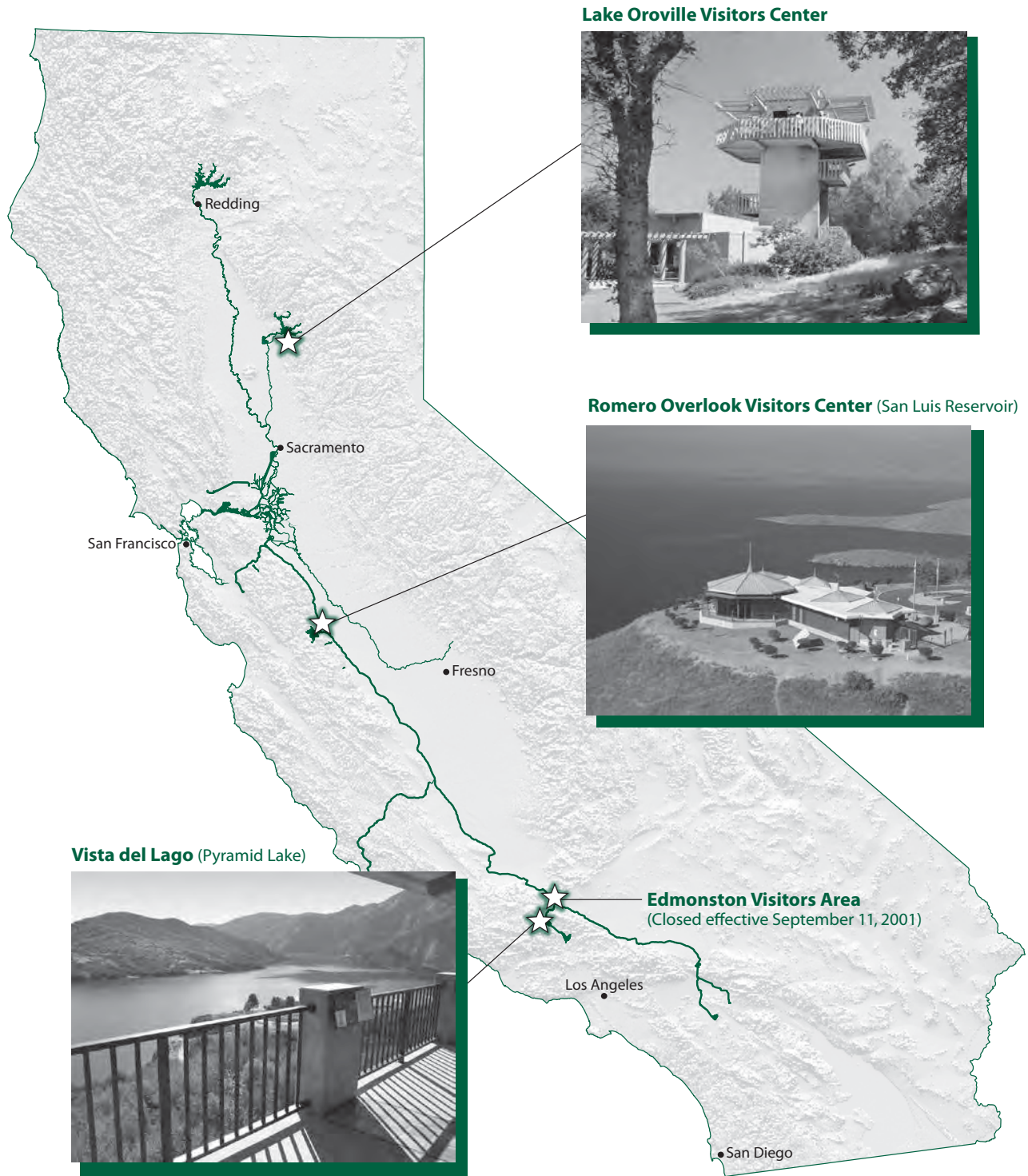


Figure 15-1 Visitors Centers on the SWP

Community Relations and Recreational Safety

PAO staff continued to educate the public about water conservation and the Save Our Water program through DWR's award-winning water efficient gardens at the California State Fair, and with an exhibit at the Tamale Festival in Indio County. Other Save Our Water outreach that PAO staff assisted with included booths at the Alameda County Fair and the Cornflower Farms Open House event in Elk Grove. Additionally, DWR worked with Radio Disney for the third year to educate younger Californians about water conservation via public service announcements and at Northern California regional events.

Using many ways to develop relationships with various communities through water recreation, education, conservation, and safety, PAO administers the annual Lakes and Reservoirs Appreciation Week in the summer. Lakes and Reservoirs Appreciation Week was held July 1–7, 2011. This event promotes clean, safe, and nonpolluting forms of recreation at lakes and reservoirs, including those in the SWP system.

DWR also co-sponsors and coordinates "Catch A Special Thrill" (C.A.S.T.) fishing events for disabled and disadvantaged children. During 2011, C.A.S.T. events were held at Lake Oroville, Lake del Valle, Castaic Lake, Silverwood Lake, and Lake Perris.

DWR continued its partnerships with communities to offer nine Aquatic Adventure Camps throughout the summer months, teaching water safety to children, especially those who would most benefit from positive youth development. The camps utilized facilities at Lake Oroville, Lake del Valle, Castaic Lake, and Lake Perris.

SWP Recreation Outreach Program

The goal of the SWP recreation outreach program is to educate the public about the many recreational opportunities available at SWP facilities. PAO staff attends community events, State and county fairs, State and federally sponsored events, and forms partnerships with State, federal, and community groups.

SWP Recreation Outreach Events

DWR, the California Department of Parks and Recreation, and several partner agencies co-sponsored or attended the following recreation outreach events in 2011:

- Sacramento International Sportsmen's Exposition, Sacramento;
- North State Sportsman Expo, Chico;
- Jack Splash Club/Oroville YMCA Healthy Kids Day/Kiwanis Egg Hunt, Oroville;
- Oroville Feather Fiesta Days, Oroville;
- Fit-N-Fun Day, Oroville;
- O'Neill Forebay Fun & Fishing Day for Kids, Gustine;
- Oroville Hooked on Fishing Not Drugs, Oroville;
- C.A.S.T. New Melones Lake, Sonora;
- C.A.S.T. Lake Oroville, Oroville;
- C.A.S.T. Lake del Valle, Livermore;
- Butte County Fair Sportsmen's Expo, Gridley;
- Pittsburg Seafood Festival, Pittsburg;
- Save the Auburn Ravine Salmon and Steelhead Festival, Lincoln;
- Feather River Salmon Festival, Oroville;
- El Dorado Sportsman's and Outdoor Expo, Placerville; and
- Stanislaus River Salmon Festival, Knight's Ferry.

The Jack Splash Club was created by PAO as a way to interest and educate kids and their families in the Oroville area about safe water recreation. The Oroville YMCA helped manage the club because of its

water safety programs, fitness programs, and community standing.

SWP Recreation Outreach Publications

The following recreation outreach publications were made available to the public:

- *Family Getaway Map*
- *Family Getaway Guide*
- *Lake Oroville Recreation*
- *Best Bass Fishing Lake*
- *Lake Oroville Floating Campsite*
- *Upper Feather River Lakes*
- *South Bay Aqueduct/Lake del Valle/Bethany Reservoir*
- *San Luis Joint-Use Complex*
- *Quail Lake*
- *Pyramid Lake*
- *Castaic Lake*
- *Lake Perris*
- *Silverwood Lake*
- *Fishing along the State Water Project*
- *State Water Project Recreation Facilities*
- *Water Safety along the SWP*
- *Quagga Warning Card*
- *Quagga Info Sheet*

The *Family Getaway Map* and *Family Getaway Guide* were developed to expand the public's awareness of the waters of California, including rivers, lakes, and reservoirs.

School Education Program

The School Education Program's goal is to provide students and educators with a statewide perspective on water issues such as conservation, conveyance systems, and the water cycle. PAO staff develops and promotes high-quality materials, providing them free of charge to schools, educators, and water districts.

Public Events and Outreach

PAO staff provided displays of DWR's interactive children's exhibits and other educational materials at:

- the Sacramento Municipal Utility District's Youth Energy Summit, Sacramento;
- AgVenture, San Joaquin County;
- the Children's Water Education Festival, Yorba Linda;
- the Sacramento Area Creeks Council's Creek Week Event, Sacramento;
- the CalEPA Earth Day Event, Sacramento;
- State Scientists' Day, Sacramento; and
- the Lindsay Wildlife Museum's Educator Resource Fair, Walnut Creek.

PAO staff organized a team of DWR judges from multiple divisions and provided a special award at the Sacramento Regional Science and Engineering Fair in Sacramento.

Publications and Materials

Curriculum materials and children's videos were provided to California teachers and water agencies through the *Water Facts & Fun* online catalog and order form, and during promotional events. During 2011, the following materials were purchased or reprinted:

- 10,000 *California Water Works & Why It Does* student booklets;
- 3,000 *Captain Hydro* student workbooks;
- 4,750 California Environmental Education Interagency Network resource brochures;
- 325 *Conservation Connection* student books;
- 325 *Conservation Connection* teacher guides;
- 5,000 *KIDS: Discover Storm Water* student activity booklets;
- 7,500 hamburger activity sheets for students;

- 4,000 parent/student water conservation checklists;
- 8,000 *Water & Me* student activity booklets;
- 7,500 water conservation pledge sheets; and
- 380 *Project WET* (Water Education for Teachers) books, which were provided to pre-service teachers who participated in Project WET training workshops.
- Delta Studies Institute for teachers, co-sponsored with the San Joaquin County Office of Education.

Collaboration and Partnerships

DWR's School Education Program seeks to partner with other entities with similar interests and goals to pool resources in educating California's youth on the importance of water resources. During 2011, PAO staff participated in the following collaborative activities/meetings:

- Project WET Advisory Committee, the California Environmental Education Interagency Network Committee,
- California Urban Water Conservation Council's Education subcommittee and the Northern California Water Educators Collaborative;
- Creek Week Planning Committee, where activity passports, artwork for a poster, brochures, and a Creek Week Celebration bookmark were provided; and
- Caring for Our Watersheds contest, sponsored by Agrium and the Center for Land-Based Learning.

Additional collaborative efforts included PAO staff working with the following:

- California Department of Education's California Regional Environmental Education Community Network;
- California Environmental Education Foundation Teacher Institute;
- Floodplain and Delta Ecology Institute for teachers, co-sponsored with the San Joaquin County Office of Education; and

Glossary

This glossary contains terms used in the text of Bulletin 132-12 as well as additional terms related to water resources.

A

abundance The number of organisms of a particular kind in a population. (See also, abundance index.)

abundance index (fisheries) A relative measure of the weight or number of fish in a stock, a segment of the stock (e.g. the spawners), or an area. Often available in time series, the information is collected through scientific surveys or inferred from fishery data.

acre-foot The volume of water that would cover one acre to a depth of one foot; equal to 43,560 cubic feet or 325,851 gallons.

adaptive management The process of improving management effectiveness by learning from the results of carefully designed decisions or experiments.

adipose fin A small fleshy fin with no rays on the topside of a fish located between the fin on the back and the tail fin.

afterbay A storage reservoir downstream of a power plant or large reservoir that regulates fluctuating discharges from a hydroelectric power plant or a pumping plant.

agricultural drainage (1) The process of directing excess water away from root zones by natural or artificial means, such as by using a system of drains placed below ground surface level; also called subsurface drainage; (2) the water drained away from irrigated farmland.

alluvium Unconsolidated soil strata deposited over time by flowing water.

amphipod A small crustacean with a flat (laterally compressed) body belonging to the group Amphipoda, found in freshwater or marine environments.

amphipod A small crustacean with a flat (laterally compressed) body belonging to the group Amphipoda, found in freshwater or marine environments.

anadromous Fish that live the majority of their life cycle in the sea and return to freshwater streams to spawn.

anion An atom or a molecule in which the total number of electrons is greater than the total number of protons, giving it a net negative electrical charge.

aquifer A geologic formation that stores water underground (called groundwater), especially one that yields significant quantities of water to wells or springs.

arid Describes a climate or region in which precipitation is so deficient in quantity or occurs so infrequently that intensive agricultural production is not possible without irrigation.

artificial recharge The addition of surface water to a groundwater basin by human activity, such as putting surface water into spreading basins.

average annual runoff The average value of annual runoff volume calculated for a selected period of record, at a specified location, such as a dam or stream gauge.

average year water demand Demand for water under average hydrologic conditions for a defined level of development.

B

balanced water conditions These exist when upstream reservoir storage releases, plus other inflows, approximately equal the water supply needed to (1) satisfy Sacramento Valley and Sacramento-San Joaquin Delta in-basin needs, including Delta water quality requirements, and (2) meet export needs. DWR and Reclamation jointly decide when balanced or excess water conditions exist.

beneficial use Water quality beneficial use categories for water are designated by State law. Beneficial uses of the waters of the State that may be protected against water quality degradation include, but are not limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

benthic organisms Aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water.

biological assessment A document prepared as part of the Endangered Species Act, Section 7 process to determine whether a proposed major construction activity under the authority of a federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.

biological opinion A document required by the Endangered Species Act stating the opinion of the U.S. Fish and Wildlife Service or National Marine Fisheries Service on whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

biota Living organisms of a region, as in a stream or other body of water.

brackish water Water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Considerably less saline than sea water.

bromide A salt which naturally occurs in small quantities in sea water; a compound of bromine.

Burns-Porter Act (California Water Code Section 12930 et seq.) Formally known as the California Water Resources Development Bond Act, this act passed the Legislature in 1959 and was approved by voters in 1960. It provided initial funding of \$1.75 billion in general obligation bonds and authorized construction of the State Water Project facilities.

bypass As part of a flood management system, a natural overflow area or channel that allows excessive floodwaters to flow or be diverted from a main river channel to prevent water from overflowing the main river channel.

C

CALFED Bay-Delta Program A federal and State multiagency program the goals of which are to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management in the Bay-Delta system.

California Data Exchange Center (CDEC) CDEC installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gauges for the DWR Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered cooperatively throughout the State.

California Irrigation Management Information System (CIMIS) A network of automated weather stations that are owned and operated cooperatively between the DWR and local agencies. The stations are installed in most of the agricultural and urban areas of the State and provide farm and large landscape irrigation managers and researchers with “real-time” weather data to estimate crop and landscape evapotranspiration rates and make irrigation management decisions.

California Water Resources Simulation Model (CALSIM) A computer model that simulates operations of the SWP and CVP water delivery systems. CALSIM II is a planning tool that was jointly developed by DWR and Reclamation. The model's inputs include hydrologic data for specified study planning years, water demands, infrastructure and regulatory change, and other factors. Outputs include deliveries to water contractors, river flows, reservoir changes, Delta hydrologic parameters, and other data.

cation An atom or a molecule in which the total number of protons is greater than the total number of electrons, giving it a net positive electrical charge.

Central Valley Project deliveries The volume of water imported to a given area through the Central Valley Project.

ciliates Single-celled organisms, characterized by the presence of many hair-like structures called cilia used for locomotion and for feeding.

climate change Any significant change in the measures of climate lasting for an extended period of time. This includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer.

coded wire tag A small piece of stainless steel wire injected into the snout of juvenile salmon and steelhead. Each tag is etched with a binary code that identifies a fish release group.

conjunctive use Application of surface and groundwater to meet the demand for a beneficial use. Coordinated and planned management of both surface and groundwater resources in order to maximize the efficient use of the resource; that is, the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later planned use by intentionally recharging the basin during years of above-average surface water supply.

conservation facilities Reservoir facilities which store water and make it available for later use.

consultation The process required of a federal agency under Section 7 of the Endangered Species Act when any activity authorized, carried out, or conducted by that agency may affect a listed species or designated critical habitat; consultation is with the U.S. Fish and Wildlife Service or National Marine Fisheries Service and may be either informal or formal.

conveyance Provides for the movement of water and includes the use of natural watercourses and constructed facilities including open channels, pipelines, diversions, fish screens, distribution systems, and pump lifts.

conveyance facilities Canals, pipelines, pump lifts, ditches, etc., used to move water from one area to another.

cryptomonad A single-celled, photosynthetic organism with two flagella that inhabits both marine and freshwater environments.

cyanobacteria Photosynthetic, nitrogen-fixing, colonial bacteria found in a wide variety of terrestrial and aquatic habitats, often referred to as “blue-green algae.”

D

Davis-Grunsky Act Authorized in 1960 as part of the Burns-Porter Act, this act provides construction loans for local domestic water projects and agricultural water conservation projects.

Decision 1485 operating criteria The standards for operating the CVP and SWP under Water Right Decision 1485 for the Sacramento-San Joaquin Delta and Suisun Marsh, adopted by the State Water Resources Control Board in August 1978.

Delta outflow Freshwater outflow from the Sacramento-San Joaquin Delta to protect the beneficial uses within the Delta from the incursion of saline water.

Delta outflow index A calculated approximation of the seaward freshwater outflow as it passes Chipps Island near Pittsburg, beyond the confluence of the Sacramento and San Joaquin rivers.

desalting A process to reduce the salt concentration of sea water or brackish water.

diatom Microscopic marine or freshwater colonial algae which have cell walls made out of silica.

dinoflagellate A small single-celled organism with flagella and an internal skeleton of cellulose-like plates, found in both freshwater and marine environments and best known as causers of harmful algal blooms.

discount rate The interest rate used to calculate the present value of future benefits and future costs or to convert benefits and costs to a common time basis.

dissolved organic compounds Carbon-based substances dissolved in water.

dissolved oxygen The amount of oxygen dissolved in water or wastewater, usually expressed in milligrams per liter, parts per million, or percent of saturation.

distinct population segment A subdivision of a species that is treated as a species for purposes of listing under the Endangered Species Act. The smallest division of a taxonomic species that can be protected under the Endangered Species Act.

drainage area The area of land from which water drains into a river; for example, the Sacramento River Basin, in which all land area drains into the Sacramento River. Also called a watershed, drainage basin, or river basin.

drought preparedness The magnitude and probability of economic, social, or environmental consequences that would occur as a result of a sustained drought under a given study plan.

drought condition Hydrologic conditions during a defined period, greater than one dry year, when precipitation and runoff are much less than average.

drought year supply The average annual supply of a water development system during a defined drought period.

Delta Simulation Model 2 (DSM2) A hydrodynamic and water quality simulation model used to simulate water quality conditions in the Sacramento-San Joaquin Delta. The model is frequently used to evaluate potential changes in Delta conditions (salinity, flow, and water level) associated with changes in flow patterns in the Delta.

E

ecosystem restoration The activity of improving the condition of natural landscapes and biotic communities.

effluent Wastewater or other liquid, treated or in its natural state, flowing from a treatment plant or process.

electrical conductivity The measure of the ability of water to conduct an electrical current, the magnitude of which depends on the dissolved mineral content of the water.

endangered species An animal or plant species in danger of extinction throughout all or a significant portion of its range.

entrainment The unintended diversion of fish (or other aquatic organisms) into an unsafe passage route. The incidental trapping of any life stage of fish within waterways or structures that carry water being diverted for use

elsewhere. Fish are considered “entrained” when they enter a diversion point, which for the SWP is Clifton Court Forebay.

environmental impact report A report done to analyze project or program impacts on a variety of resources under the California Environmental Quality Act.

environmental impact statement A report done to analyze project or program impacts on a variety of resources under National Environmental Policy Act.

environmental water The water for wetlands, for the instream flow in a major river or in the Bay-Delta, or for a designated wild and scenic river.

escapement The portion of an anadromous fish population that escapes commercial and recreational fisheries and reaches its freshwater spawning grounds.

estuary A semi-closed coastal body of water where the lower course of a river enters the sea, influenced by tidal action where the tide meets the river flow, resulting in brackish water.

evapotranspiration The amount of water transpired by plants, retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces. (See also, reference evapotranspiration.)

excess water conditions Periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceeds Sacramento Valley in-basin uses plus exports. DWR and Reclamation jointly decide when balanced or excess water conditions exist. During excess water conditions, sufficient water is available to meet all beneficial needs and the CVP and SWP are not required to supplement the supply with water from reservoir storage.

export An amount of water transported from one source or location to another.

F

firm yield The maximum annual supply of a water development project under drought conditions, for some specified level of demand.

flagellates Organisms with one or more whip-like structures called flagella, which are used for locomotion or feeding.

floodplain A strip of relatively level land bordering a stream or river that is often inundated during times of high water.

forages Food for animals, especially crops grown to feed horses, cattle, and other livestock.

forebay A reservoir at the intake of a pumping plant or power plant to stabilize water levels; also a storage basin for regulating water for percolation into groundwater basins.

fork length A measurement used frequently for fish length when the tail has a fork shape; projected straight distance between the tip of the snout and the fork of the tail.

freeboard The height of the physical top of a levee above a specified water surface elevation. This serves as a factor of safety for containing water in the stream or reservoir without overtopping the levee or dam.

fry Young, recently hatched fish that are able to swim and catch their own food.

G

greenhouse gas emissions Also referred to as carbon intensity or carbon footprint. Gases that trap heat in the atmosphere are called greenhouse gases. These include carbon dioxide, methane, nitrous oxide, and fluorinated gases.

grilse A term that generally refers to young adult salmonids of a certain length and age. Grilse are often 55-65 centimeters (22-26 inches) in length. They are assumed to be two years old, and adults are assumed to be age three and older.

groundwater Water located beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated. It excludes soil moisture, which refers to water held by capillary action in the upper unsaturated zones of soil or rock.

groundwater bank Groundwater banking refers to the practice of recharging specific amounts of water in a groundwater basin during wet or above-average years, which can later be withdrawn and used by the depositing entity.

groundwater basin An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom.

groundwater recharge The natural or intentional infiltration of surface water into the zone of saturation (i.e., into groundwater).

groundwater storage capacity The volume of void space that can be occupied by water in a given volume of a formation, aquifer, or groundwater basin.

groundwater table The upper surface of the zone of saturation in an unconfined aquifer.

H

habitat The place or environment where a plant or animal naturally lives and grows (a group of particular environmental conditions).

habitat conservation plan A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area. Required before a federal Endangered Species Act incidental take permit may be issued.

halophyte A plant capable of growing in salty soil.

haptophyte A kind of unicellular marine phytoplankton, typically covered in tiny scales or plates composed of carbohydrates and calcium deposits.

hydraulic barrier (1) A barrier created by injecting fresh water to control seawater intrusion in an aquifer, or created by water injection to control migration of contaminants in an aquifer. (2) A barrier developed in the estuary by release of fresh water from upstream reservoirs to prevent intrusion of sea water into the body of fresh water.

hydrologic balance An accounting of all water inflow to, water outflow from, and changes in water storage within a hydrologic unit over a specified period of time.

hydrologic basin Where, conceptually, any drop of water that falls in the basin will flow to a stream or groundwater basin within it. It is a larger set of which a subset is the groundwater basin which can be within a hydrologic basin. DWR's hydrologic regions are collections of the larger hydrologic basins.

hydrologic region A geographical division of the State based on the local hydrologic basins. There are 10 hydrologic regions in California.

hydrology The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

I

in-lieu recharge The practice of providing surplus surface water to historic groundwater users, thereby leaving groundwater in storage for later use.

ion exchange Processes of purification, separation, and decontamination of aqueous and other ion-containing solutions with solid ion exchangers such as sodium carbonate used for water softening.

instream use Use of water within its natural watercourse as specified in an agreement, water rights permit, etc. For example, the use of water for navigation, recreation, fish and wildlife, aesthetics, and scenic enjoyment.

integrated regional water management A comprehensive approach for determining the appropriate mix of demand and supply management options to provide long-term, reliable water supply at the lowest reasonable cost and with the highest possible benefits to customers, economic development, environmental quality, and other social objectives.

invertebrate An animal that lacks a backbone.

J

joint points of diversion The ability of the SWP to use Jones Pumping Plant as a point of diversion and the CVP to use Banks Pumping Plant as a point of diversion. The SWP and CVP may use one another's diversion facilities under certain conditions.

joint powers agreement An agreement entered into by two or more public agencies that allows them to jointly exercise any power common to the contracting parties. This is defined in Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the California Government Code.

joint-use facilities Those portions of the SWP which serve both SWP and CVP functions, and in which both State and federal agencies participate in the construction and use; specifically, the San Luis complex and Reaches 3, 4, 5, 6, and 7 of the California Aqueduct.

jurisdictional dam Artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more, which are regulated by the Division of Safety of Dams.

K

kathablepharid A specific type of cryptomonad.

L

land subsidence The lowering of the natural land surface in response to earth movements, lowering of fluid pressure or groundwater level, consolidation of underlying soils, removal of underlying supporting materials by mining (oil and gas extraction), compaction caused by wetting, or oxidation of organic matter in soils (peat soil being converted to gas).

legal Delta The legal geographical boundaries of the Sacramento-San Joaquin Delta, as established by the Delta Protection Act of 1959, and as defined in California Water Code Section 12220.

listed species A species, subspecies, or distinct population segment that has been added to the federal list of endangered and threatened wildlife and plants. The term also applies to a species or subspecies added to the California list of endangered or threatened plants and animals.

M

maximum contaminant level The highest drinking water contaminant concentration allowed under federal and State Safe Drinking Water Act regulations.

mitigation (1) An action or set of actions designed to avoid, minimize, reduce, eliminate, or compensate for adverse environmental impacts due to an agency activity or program. (2) Reduction of human activities that affect global climate change; includes strategies to reduce greenhouse gas emissions.

Monterey Agreement An agreement executed in December 1994 among DWR and the SWP water contractors to address fundamental contract issues by amending the long-term water supply contracts.

Monterey Amendments Amendments to the long-term water supply contracts for the SWP entered into by DWR and most (27 of 29) of the SWP water contractors in 1995 and 1996 as implementation of the terms of the Monterey Agreement.

multipurpose project A project, usually a reservoir, designed to serve more than one purpose, and whose costs are normally allocated among the different functions it provides. For example, a project that provides water supply, flood control, and generates hydroelectricity.

N

natural community conservation planning (NCCP) A process that promotes multispecies and multihabitat management and conservation through cooperative efforts among public agencies, private landowners, and other interests within a plan area. It provides a framework for minimizing impacts on plant communities and wildlife from proposed development projects.

natural recharge Natural replenishment of an aquifer generally from snowmelt and runoff through seepage from the surface.

net groundwater The amount of groundwater extraction in excess of deep percolation.

nonreimbursable costs The part of project costs allocated to general statewide or national beneficial purposes and funded from general revenues, rather than by water users.

normalized demand The process of adjusting actual water use in a given year to account for unusual events such as dry weather conditions, government price support programs for agriculture, rationing programs, or other unusual conditions.

O

operational yield An optimal amount of groundwater that should be withdrawn from an aquifer system or a groundwater basin each year. It is a dynamic quantity that must be determined from a set of alternative groundwater management decisions subject to goals, objectives, and constraints of the management plan.

Operations Criteria and Plan (OCAP) (1) The document titled, "Long-Term Central Valley Project Operations Criteria and Plan," that serves as a baseline description of the facilities and operating environment of the CVP and SWP and identifies factors influencing the physical and institutional conditions and decision-making process under which the project currently operates. Regulatory and legal requirements are explained and alternative operating models and strategies described. (2) The document titled, "Central Valley Project Operations Criteria and Plan" (CVP-OCAP, 2004), that describes the laws, regulations, and other criteria applicable to operations of the CVP that were in effect from 1991 through 2003.

Operations Criteria and Plan biological opinion (1) The document titled, "Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and the State Water Project" (NOAA Fisheries, 2009). (2) The December 15, 2008, memorandum from USFWS to Reclamation that

comprises the USFWS biological opinion on the coordinated operations of the CVP and SWP.

otolith Ear bone of a fish. Otoliths often show seasonal or annual rings that can be used to determine age.

outflow The amount of applied water and conveyance water leaving the service area. Also conveyance outflow.

P

parr The developmental life stage of salmon and trout when the young have developed parr marks (vertical bars or spots on the sides of the fish) and are actively feeding in fresh water.

pelagic Inhabiting the water column as opposed to being associated with the bottom; generally occurring anywhere from the water's surface down to, but not including, the bottom.

pelagic fish Fish that live in open water, often near the surface.

perched groundwater Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater.

perennial yield The maximum quantity of water that can be annually withdrawn from a groundwater basin over a long period of time without developing an overdraft condition.

permeability The capability of soil or other geologic formations to transmit water.

phytoplankton Minute plants, such as algae, that live suspended in bodies of water and that drift about because they cannot move by themselves or because they are too small or too weak to swim effectively against a current.

precipitation A deposit on the earth of hail, rain, mist, sleet, or snow. It is the common process by which atmospheric water becomes surface or subsurface water.

project yield The water supply attributed to all features of a project, including integrated operation.

proposal solicitation package (PSP) As part of the formal solicitation for grant applications, a PSP provides detailed instructions on the mechanics of submitting proposals and specific information on submittal requirements.

public trust doctrine A legal doctrine recognizing public rights in the beds, banks, and waters of navigable waterways, and the State's power and duty to exercise continued supervision over them as trustee for the benefit of the people.

pump lift (1) The vertical distance that a pump will raise water. (2) The distance between the groundwater table and the overlying land surface.

pumped storage project A hydroelectric power plant and reservoir system using an arrangement whereby water released for generating energy during peak load periods is stored and pumped back into the upper reservoir, usually during periods of reduced power demand.

pumping-generating plant A plant which can either pump water or generate electricity, depending on the direction of water flow.

punch list A list of tasks or "to-do" items necessary for the completion of a construction project.

R

radial gates Gates used to control the flow of water into or from a reservoir, canal, pipeline, or through a channel. Each gate can close under its own weight and is operated independently by remote control.

radio-telemetry Automatic measurement and transmission of data from remote sources via radio to a receiving station for recording and analysis.

rate structure Designates the rate basis for cost recovery (e.g., flat, uniform, tiered, etc.). Block/Tiered rates are assumed to provide cost signals to consumers. Costs can include capital, operation and maintenance, financing, environmental compliance (documentation, permitting, and mitigation), etc.

reach On the California Aqueduct, a specific segment of the canal, identified by a number, which is the smallest unit of the SWP identified in water supply contracts for cost allocation and repayment purposes.

rearing Refers to the amount of time that juvenile fish spend feeding in nursery areas of rivers, lakes, streams, and estuaries before migration.

reasonable and prudent alternatives Alternative actions that can be implemented in a manner consistent with the intended purpose and scope of a project, are economically and technologically feasible, and would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

recharge Water added to an aquifer or the process of adding water to an aquifer. Groundwater recharge occurs either naturally as the net gain from precipitation or artificially as the result of human influence.

recharge basin A surface facility constructed to infiltrate surface water into a groundwater basin.

recreation Water-dependent recreation activities that are consumptive (e.g., parks), flat-water (e.g., boating), or flow-based (e.g., whitewater rafting).

recycled water (1) The application of treated water/reclaimed water to meet a beneficial use, supplanting a potable or potentially potable supply. (2) Treated municipal, industrial, or agricultural wastewater to produce water that can be reused.

redd A shallow nest of fish eggs covered with gravel in a streambed.

reference evapotranspiration (ET_0) The evapotranspiration rate from an extended surface of 3 to 6 inch (8 to 15 centimeter) tall green grass cover of uniform height, actively growing, completely shading the ground, and not short on water (the reference ET reported by CIMIS).

reliability planning Water reliability management planning is done by comparing the costs of taking actions to maintain or increase reliability to the costs of accepting less reliability. On this basis, accepting of the costs of adverse effects of less than 100 percent reliability could be a legitimate planning decision. Providing full water supply to meet 100 percent of projected future water demand is not the planning goal, rather, the goal is to find the justified level of reliability.

reoperation See system reoperation.

repayment reach Aqueduct reaches are delineated for the purpose of making project repayment as equitable as possible. The reaches are generally numbered consecutively from the Delta with Reach 1 being first. Repayment reaches vary greatly in length. (See also, reach.)

required instream flow The amount of water required for instream use by agreement, water rights permit, or State/federal acts.

reused water The application of previously used water to meet a beneficial use, whether treated or not prior to the subsequent use (cf. recycled water).

return flow The portion of withdrawn water not consumed by evapotranspiration or system losses which returns to its source or to another body of water.

reverse osmosis A method to remove salts and other constituents from water by forcing water through membranes.

riparian area The area of land adjacent to a stream, lake, or wetland with vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas. Riparian areas provide important wildlife habitat (including fish habitat, when sufficient to overhang, extend into, or fall into the water).

riparian [water] right A right to use surface water, such right derived from the fact that the land in question abuts the banks of a stream or other water source (lake or pond). These rights are senior to most appropriative water rights.

run (of fish) A group of fish of the same species whose upstream spawning migration timing is associated with the seasons, e.g., fall, spring, summer, and winter runs. Members of a run may interbreed with fish of another run.

runoff The volume of surface flow from an area during a specified period. Natural runoff is the portion of precipitation that runs off the land and makes up the natural flow in rivers. Incidental runoff is the portion of precipitation that would have been used by natural vegetation but now contributes to runoff. This is a result of roads, paved areas, building roofs, land drainage systems, fields developed for irrigation, and other changes in land use.

S

sabellid polychaete A segmented marine worm which lives in a tube that it builds.

saline intrusion The movement of salt water into a body of fresh water. It can occur in either surface water or groundwater bodies.

salinity Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration, weight (total dissolved solids), electrical conductivity, or osmotic pressure. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. (See also, total dissolved solids.)

salmonid A fish species belonging to the salmon family, including salmon and trout.

salt-water barrier A physical facility or method of operation designed to prevent the intrusion of saltwater into a body of fresh water.

salvage (fish) At the SWP and CVP fish protective facilities, fish are removed from export water, transported, and released away from the influence of the water diversion facilities.

sediment Soil or mineral material transported by water and deposited in streams or other bodies of water.

seepage The gradual movement of water into, through, or from a porous medium. Also, the infiltration of water into the soil from canals, ditches, laterals, watercourses, reservoirs, storage facilities, or other bodies of water or from a field.

service area The geographic area served by a water agency.

smolt A juvenile salmonid fish that has assumed the silvery color of the adult and, while migrating toward the ocean, is undergoing physiological changes that allow it to live in saltwater.

snowpack The annual accumulation of snow in mountain areas.

soluble minerals Naturally occurring substances capable of being dissolved.

special status species Plants or animals legally protected under either the federal or California Endangered Species Act or the California Fish and Game Code; those species not currently protected by statute but considered to be rare or endangered under the California Environmental Quality Act; and species considered by the scientific community to be sufficiently rare to qualify for such listing (e.g., candidate species for listing as threatened or endangered, species of concern to the Department of Fish and Wildlife or U.S. Fish and Wildlife Service, or rare plants identified by the California Native Plant Society).

species of concern An informal term referring to a species that might be in need of conservation action.

spillway The section of a dam designed to permit water to pass over its crest; a weir or channel taking overflow from the dam. The spillway serves as a safety channel to prevent erosion or overtopping of the dam.

sprinkler irrigation A method of irrigation in which the water is sprayed, or sprinkled, through the air to the ground surface.

stakeholder Individuals or groups who can affect or be affected by an organization's activities; individuals or groups with an interest or "stake" in what happens as a result of a decision or action.

State Water Project deliveries The volume of water imported to a given area from the State Water Project.

statewide water management systems These include physical facilities (more than 1,200 State, federal, and local reservoirs, as well as canals, treatment plants, and levees), which make up the backbone of water management in California; and statewide water management programs, which include water-quality standards, monitoring programs, economic incentives, water-pricing policies, and statewide water-efficiency programs such as appliance standards, labeling, and education.

strategic plan The long-term goals of an organization or program and an outline of how they will be achieved (e.g., adopting specific strategies, approaches, and methodologies).

stocking Releasing hatchery-raised fish into water body for the purposes of supplementing existing populations or creating new ones for fishing or to increase a species population. Same as planting.

streamflow The rate of water flow past a specified point in a channel.

subsidence See land subsidence.

surface storage Surface storage uses reservoirs to collect water for later release and use.

surface supply Water supply obtained from streams, lakes, and reservoirs.

system reoperation Changes to existing water system operations and management procedures for existing reservoirs and conveyance facilities to increase their water-related benefits.

T

threatened species An animal or plant species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

tidal wetlands The margins of an estuary that are periodically inundated by tides; includes all habitats within the elevation range between the lowest and highest tides: intertidal mudflats, regularly inundated tidal marsh plains, tidal channels within the marsh, and infrequently inundated wetland-upland transition zones at the edge of the upland.

total capital cost The total monetary cost of option required for “turnkey” implementation, including environmental and third-party impact mitigation, storage, conveyance, energy, capitalized operations and maintenance, administrative costs, planning costs, legal costs, and engineering costs.

total dissolved solids The quantity of the residual minerals dissolved in water that remain after evaporation of a solution.

transpiration An essential physiological process in which plant tissues give off water vapor to the atmosphere.

tributary A stream that flows into a larger stream or other body of water.

tubificid worm An aquatic worm with a small, thin, segmented body.

turbidity A measure of the cloudiness of water caused by the presence of suspended particles in the water which attenuate or reduce light penetration. Turbidity in natural waters may be composed of organic and/or inorganic constituents and may have direct implications to drinking water treatment.

turnout The point at which water is diverted from a main channel or water delivery facility to a distributing facility; a structure through which a water contractor takes delivery of water.

U

unimpaired flow The flow past a specified point on a natural stream that is unaffected by stream diversion, storage, import, export, return flow, or change in use caused by modifications in land use.

unimpaired runoff A representation of the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

Urban Water Management Planning Act Sections 10610 through 10657 of the California Water Code. The act requires urban water suppliers to prepare urban water management plans which describe and evaluate sources of water supplies, efficient uses of water, demand management measures, implementation strategies and schedules, and other relevant information and programs within their water service areas. Urban water suppliers (Section 10617) are either publicly or privately owned and provide water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supply more than 3,000 acre-feet of water annually.

urban water use The use of water for urban purposes, including residential, commercial, industrial, recreation, energy production, military, and institutional classes. The term is applied in the sense that it is a kind of use rather than a place of use.

urban water use efficiency Methods or technologies resulting in the same beneficial residential, commercial, industrial, and institutional uses with less water or increased beneficial uses from existing water quantities.

V

vernal pools A type of wetland that occurs in shallow foothill and valley depressions. Water remains in pools and swales until it evaporates, usually within a few days to a few months, mainly in late winter and spring.

volatile organic compound (VOC) A man-made organic compound that readily vaporizes in the atmosphere. These compounds are often highly mobile in the groundwater system and are generally associated with industrial activities.

W

wastewater Domestic or municipal sewage or effluent from an industrial process.

water demand The desired quantity of water that would be used if the water were available and if a number of other factors, such as price, did not change. Demand is not static.

water exchanges Typically water delivered by one water user to another water user; the receiving water user will return the water at a specified time or when the conditions of the parties' agreement are met. (See also, water transfers.)

water quality Description of the chemical, physical, and biological characteristics of water, usually with regard to its suitability for a particular purpose or use.

water quality objectives Specific, legally enforced levels of water quality desired for identified uses, including drinking, recreation, farming, fish production, propagation of other aquatic life, and agricultural, industrial, and urban use.

water recycling The treatment of urban wastewater to a level rendering it suitable for a specific beneficial use.

water right In water law, the right of a user to use water from a water source (e.g., a river, stream, pond, or source of groundwater).

water service reliability The degree to which a water service system can successfully manage water shortages.

water supply exports The amount of water that a region transfers to another to meet needs.

water table See groundwater table.

water transfer A temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights. A more general definition is that water transfers are a voluntary change in the way water is usually distributed among water users in response to water scarcity.

water year A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years. For DWR, a water year is October 1 through September 30.

watershed The land area from which water drains into a stream, river, or reservoir. Also called drainage area, drainage basin, or river basin.

watershed management The process of evaluating, planning, managing, restoring, and organizing land and other resource use within an area that has a single common drainage point.

weir (1) Any structure across a watercourse used to control, raise, or measure flows; (2) a barrier constructed to catch upstream migrating adult fish.

wetlands Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds. An area characterized by periodic inundation or saturation, certain types of soils, and vegetation adapted for life in saturated soil conditions.

Wild and Scenic River systems State and federally designated river systems under the 1968 national Wild and Scenic Rivers Act and the 1972 California Wild and Scenic Rivers Act. Seventeen rivers in California, including many forks and tributaries are designated wild, scenic, or recreational.

wheel As applied to water and power, to provide the use of one agency's conveyance facilities for the purpose of transporting another agency's supply.

X

X2 Delta outflow interaction with tides determines the location of the X2 isohaline salinity gradient. X2 is the location in the Bay-Delta Estuary where the tidally averaged bottom salinity is 2 parts per thousand. It is expressed as the distance in kilometers from the Golden Gate Bridge. X2 is used as a primary indicator in managing Delta outflow.

Z

zooplankton Small aquatic animals that are suspended or swimming in water.

Appendix B

Data and Computations

Used to

Determine 2013 Water Charges

Appendix B, Data and Computations Used to Determine 2013 Water Charges, was previously printed and distributed under a July 2012 cover letter from Robert Cooke, Chief of SWPAO, to State Water Project water contractors to document and support DWR's calculation of the contractors' annual charges. Appendix B appears on the following pages as it was published in July 2012. However, Table B-7 was not published in the July 2012 version of Appendix B because the data was not available at the time of publication. Table B-7 now appears in its entirety on page B-78.

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Data and Computations
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Appendix B

Data and Computations Used to Determine 2013 Water Charges

The Department of Water Resources (DWR) annually furnishes Statements of Charges to the 29 long-term State Water Project (SWP) water supply contractors. Article 29(e) of the Standard Provisions for Water Supply Contracts, approved August 3, 1962, describes those statements:

All such statements shall be accompanied by the latest revised copies of the document amendatory to Article 22 and of Tables B, C, D, E, F, and G of this contract, together with such other data and computations used by the State in determining the amounts of the above charges as the State deems appropriate.

To comply with Article 29(e), DWR performs an annual comprehensive review and redetermination of all water supply and financial aspects of the SWP for the entire project repayment period. This annual redetermination is performed in accordance with Article 22(f) and Article 28 of the water supply contracts, which concern the Delta Water Rate and annual transportation charges, respectively.

Appendix B includes data used to document the redetermination of water charges to be paid by contractors during calendar year 2013. The information is based on established data about the SWP, both known and projected, as of June 2012; however, small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If research requires more current data than was available at the time of production of

Bulletin 132, please contact the State Water Project Analysis Office. Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

The computational procedures and interrelationships between tabulations in this appendix are outlined on *Figures B-1 and B-2*. All tables referenced on *Figures B-1 and B-2* follow this text.

Types of Water Charges

Charges to SWP water supply contractors include the costs of facilities for the conservation and development of a water supply and the conveyance of such supply to SWP service areas. These facilities are classified as “Project Conservation Facilities” and “Project Transportation Facilities” in the Standard Provisions for Water Supply Contract. Names of the main facilities in each classification follow.

Project Conservation Facilities

- Frenchman Dam and Lake
- Grizzly Valley Dam and Lake Davis
- Antelope Dam and Lake
- Oroville Dam and Lake Oroville
- Oroville power facilities
- Delta facilities
- A portion of the California Aqueduct from the Delta to Dos Amigos Pumping Plant
- Sisk Dam, San Luis Reservoir, and

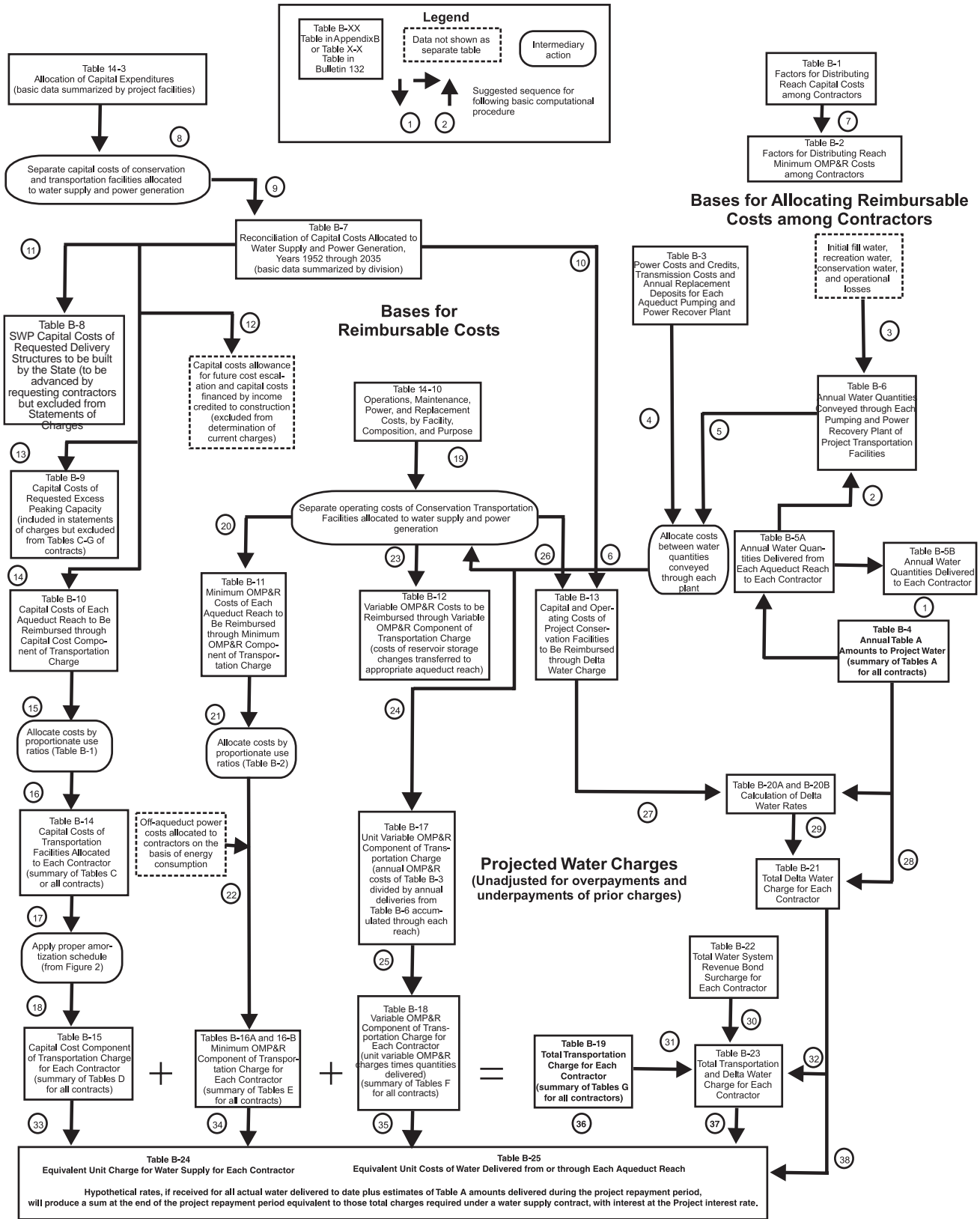


Figure B-1 Relationships of Data Used to Substantiate Statements of Charges

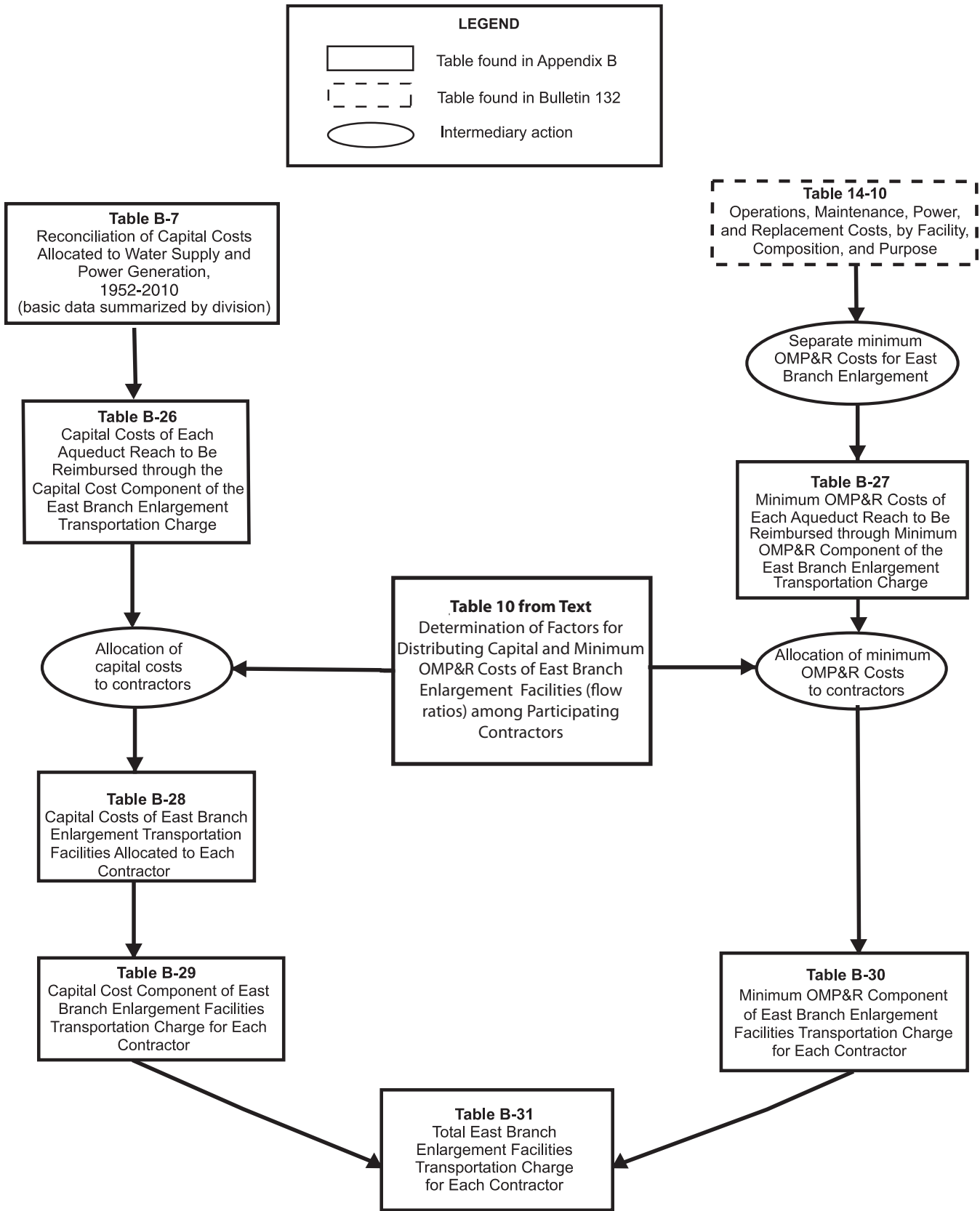


Figure B-2 Relationships of Data Used to Substantiate East Branch Enlargement Charges

Gianelli Pumping-Generating Plant

Project Transportation Facilities

- Grizzly Valley Pipeline
- North Bay Aqueduct
- South Bay Aqueduct, including Del Valle Dam and Lake del Valle
- The remainder of the California Aqueduct from the Delta to Dos Amigos Pumping Plant and all facilities south, including dams and lakes in Southern California
- Off-Aqueduct Power Facilities (Reid Gardner Unit No. 4, Bottlerock Powerplant, and South Geysers Powerplant)

The standard provisions provide for a Delta Water Charge and a Transportation Charge for project water.

The Delta Water Charge is a unit charge applied to each acre-foot of SWP water the contractors are to receive, in accordance with their contracts. The unit charge, if applied to each acre-foot of all such allocations for the remainder of the project repayment period, is calculated to result in repayment of all outstanding reimbursable costs of the Project Conservation Facilities, with appropriate interest, by the end of the repayment period (2035).

The Transportation Charge is for use of facilities to transport water to the vicinity of each contractor’s turnout(s). Generally, the annual charge represents each contractor’s proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each contractor’s allocated share of those reimbursable capital costs is amortized for repayment to the State, and certain variations are allowed in the amortization

methods. Contractors’ shares of reimbursable operating costs are repaid in the year such costs are incurred by the State.

The East Branch Enlargement Transportation Charge is paid by the seven Southern California contractors participating in the enlargement. San Bernardino Valley Municipal Water District advanced funds to pay the district’s allocated capital costs for the East Branch Enlargement. The remaining six contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each contractor also will pay an allocated share of the minimum operation, maintenance, power, and replacement (OMP&R) costs of the East Branch Enlargement.

Transportation charges for the Coastal Branch Extension, East Branch Extension, and South Bay Enlargement are being repaid by contractors in their respective service areas.

Transportation charges for the Tehachapi Afterbay are repaid by those contractors using electrical power for delivery of their Table A water downstream of the Tehachapi Afterbay.

Composition and Timing of Water Charges

As shown on *Figure B-3*, the Delta Water Charge and the Transportation Charge consist of the following three components:

1. Conservation and transportation capital cost components, which will return to the State all reimbursable capital costs;
2. Conservation and transportation minimum OMP&R components, which will return to the State all reimbursable operating costs that do not depend on

Delta Water Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of Conservation Facilities
2. Operations and maintenance costs for newly constructed Conservation Facilities prior to initial operations
3. Activation costs for newly constructed Conservation Facilities
4. Power costs allocated to initial filling of San Luis Reservoir
5. Capitalized O&M costs (major repair work and so forth) for Conservation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986
(Department of Water Resources-Department of Fish and Game agreement)

Minimum OMP&R Component

1. Direct O&M costs of Conservation Facilities
 - a. Headquarters and field divisions (portion)
 - b. Insurance and FERC costs (portion)
2. General O&M costs allocated to Conservation Facilities
 - a. Contractor Accounting Office (portion)
 - b. Financial and contract administration (portion)
 - c. Water rights
 - d. Power planning for SWP facilities (portion)
3. Replacement deposits for SWP control centers (portion)
4. Credits for a portion of Hyatt-Thermalito power generation
5. Power costs and credits related to pumping water to San Luis Reservoir for project operations (storage changes)
6. Value of power used and generated by Gianelli Pumping-Generating Plant
7. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant
(Department of Water Resources-Department of Fish and Game agreement)

Transportation Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of Transportation Facilities
2. O&M costs for newly constructed Transportation Facilities prior to initial operation
3. Activation costs for newly constructed Transportation Facilities
4. Power costs allocated to initial filling of Southern California reservoirs
5. Capitalized O&M costs (major repair work and so forth) for Transportation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986
(Department of Water Resources-Department of Fish and Game agreement)

Minimum OMP&R Component

1. Direct O&M costs of Transportation Facilities
 - a. Headquarters and field divisions (portion)
 - b. Insurance and FERC costs (portion)
2. General O&M costs related to Transportation Facilities
 - a. Contractor Accounting Office (portion)
 - b. Financial and contract administration (portion)
 - c. Power planning for SWP facilities (portion)
3. Power costs and credits related to pumping water to Southern California reservoirs for project operations (storage changes)
4. Power costs for pumping water to replenish losses from Transportation Facilities
5. Other power costs
 - a. Station service at Transportation Facility power and pumping plants
 - b. Transmission service costs related to "backbone" Transportation Facilities
6. Replacement deposits for SWP control centers (portion)
7. Off-Aqueduct Power Facility costs—bond service, bond cover costs (25 percent of bond service), bond reserves, transmission costs to provide service to backbone," fuel costs taxes, and O&M-less power sales allocated to Off-Aqueduct Power Facilities
8. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant
(Department of Water Resources-Department of Fish and Game agreement)

Variable OMP&R Component

1. Power purchase costs
 - a. Capacity
 - b. Energy
 - c. Pine Flat bond service, O&M, and transmission costs allocated to aqueduct pumping plants
2. Alamo, Devil Canyon, Warne, and Castaic power generation credited at the powerplant reach and charged to aqueduct pumping plants
3. Hyatt-Thermalito Diversion Dam powerplant generation charged to aqueduct pumping plants (credits for this generation are reflected in the Delta Water Rate)
4. Replacement deposits for equipment at pumping plants and powerplants
5. Credits from sale of excess SWP system power
6. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant
(Department of Water Resources-Department of Fish and Game agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge.

Figure B-3 Composition of Delta Water Charge and Transportation Charge

or vary with quantities of water actually delivered to the contractors; and

3. A transportation variable OMP&R component, which will return to the State all reimbursable operating costs that depend on, and vary with, quantities of water actually delivered to the contractors.

The formula for computing the Delta Water Rate, Article 22(f) of the Standard Provisions for Water Supply Contract, was designed to ensure that all adjustments for prior overpayments or underpayments of the Delta Water Charge are accounted for in a redetermination of the rate. Since the redetermined rate applies to all future allocations, such adjustments are amortized during the remainder of the project repayment period. This appendix includes a redetermination of the Delta Water Rate for 2013.

Article 28 of the standard provisions stipulates that Transportation Charges be redetermined each year. The tables in Appendix B include the numerical data used in this redetermination. Transportation Charges for prior years through 2012, included in those tables are the redetermined amounts, and do not equal the amounts actually paid by contractors.

As provided under the Water System Revenue Bond Amendment to the water supply contracts, differences between actual payments under the Transportation capital cost component and amounts computed in this redetermination are accumulated with interest and amortized during the remaining years of the contract repayment period. All computations for adjustments are included in the attachments accompanying each contractor's Statement of Charges and are reflected in revised copies of Table C through Table G of the contract, which are

also furnished to each long-term water supply contractor in the annual statements of charges.

These redeterminations exclude four charges associated with water service other than the Delta Water Charge and the Transportation Charge. The excluded charges (and the manner in which they are treated in this appendix) are outlined below.

1. Advances of funds pursuant to Article 24(d) of the standard provisions for excess capacity constructed by the State at the request of contractors.
2. Advances of funds pursuant to Article 10(d) of the standard provisions for delivery structures (turnouts) constructed by the State at the request of contractors. Partial information concerning actual and projected capital costs of such delivery structures is included in this appendix. Statements concerning these costs and data are furnished to the appropriate contractors at various times and are not part of the annual statements.
3. Payments for sale and service of surplus water to entities other than contractors, pursuant to Article 21 of the standard provisions, are also excluded. Those payments are generally based on the unit rates shown in Table B-25. Net revenues resulting from noncontractor service are applied as indicated on page 24 of Bulletin 132-71.
4. Payments under the Devil Canyon-Castaic contract for costs of the Devil Canyon-Castaic facilities allocable to power generation. Charges billed as a result of the contract are billed separately from those billed as a result of the water supply contract. Information about the treatment of such charges in relation to redetermined

Transportation Charges is included in special attachments to the bills of the six participating contractors.

Time and method of payment for corresponding components of the Delta Water Charge and the Transportation Charge are as follows:

1. The capital cost components of the Delta Water Charge and the Transportation Charge are paid in two semiannual installments, due January 1 and July 1 of each year, based on statements furnished by the State on or before July 1 of the preceding year.
2. The minimum OMP&R components of the Delta Water Charge and the Transportation Charge are paid in 12 equal installments, due the first of each month and based on statements furnished by the State on or before July 1 of the preceding year.
3. The variable OMP&R component of the Transportation Charge is paid in varying monthly amounts and is due the fifteenth day of the second month following actual water delivery. The charges are projected based on a unit charge per acre-foot established on or before July 1 of the preceding year. Those unit charges may be revised during the year to reflect current power costs and revenues. The unit charges are applied to actual monthly delivery quantities as determined by the State on or before the fifteenth day of the month following actual water delivery.

Bases for Allocating Reimbursable Costs among Contractors

This section describes procedures for allocating reimbursable costs of Project Transportation Facilities among contractors (see upper right portion of Figure B-1). Those costs do not include annual costs of Off-Aqueduct Power Facilities, which are explained in the “Project Water Charges” section.

Capital and Minimum OMP&R Costs

Figure B-4 includes information about the repayment reaches that form the basis for allocating reimbursable costs of the Project Transportation Facilities among contractors.

Allocations of reimbursable capital costs and minimum OMP&R costs of each reach are based on the proportionate maximum use of that reach by respective contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors was first reported in Bulletin 132-70. The ratios in Bulletin 132-70 were subsequently revised for the North Bay Aqueduct, the South Bay Aqueduct, the California Aqueduct from the Delta to Castaic Lake, and the Coastal Branch.

All the revisions reported in previous bulletins regarding the derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors were last reported in Tables B-1 and B-2 of Bulletin 132-91. Under Article 53 of the Monterey Amendment, agricultural contractors may sell up to 130,000 acre-feet of aqueduct capacity to municipal and industrial contractors. The first permanent transfer occurred in 1998. Currently,

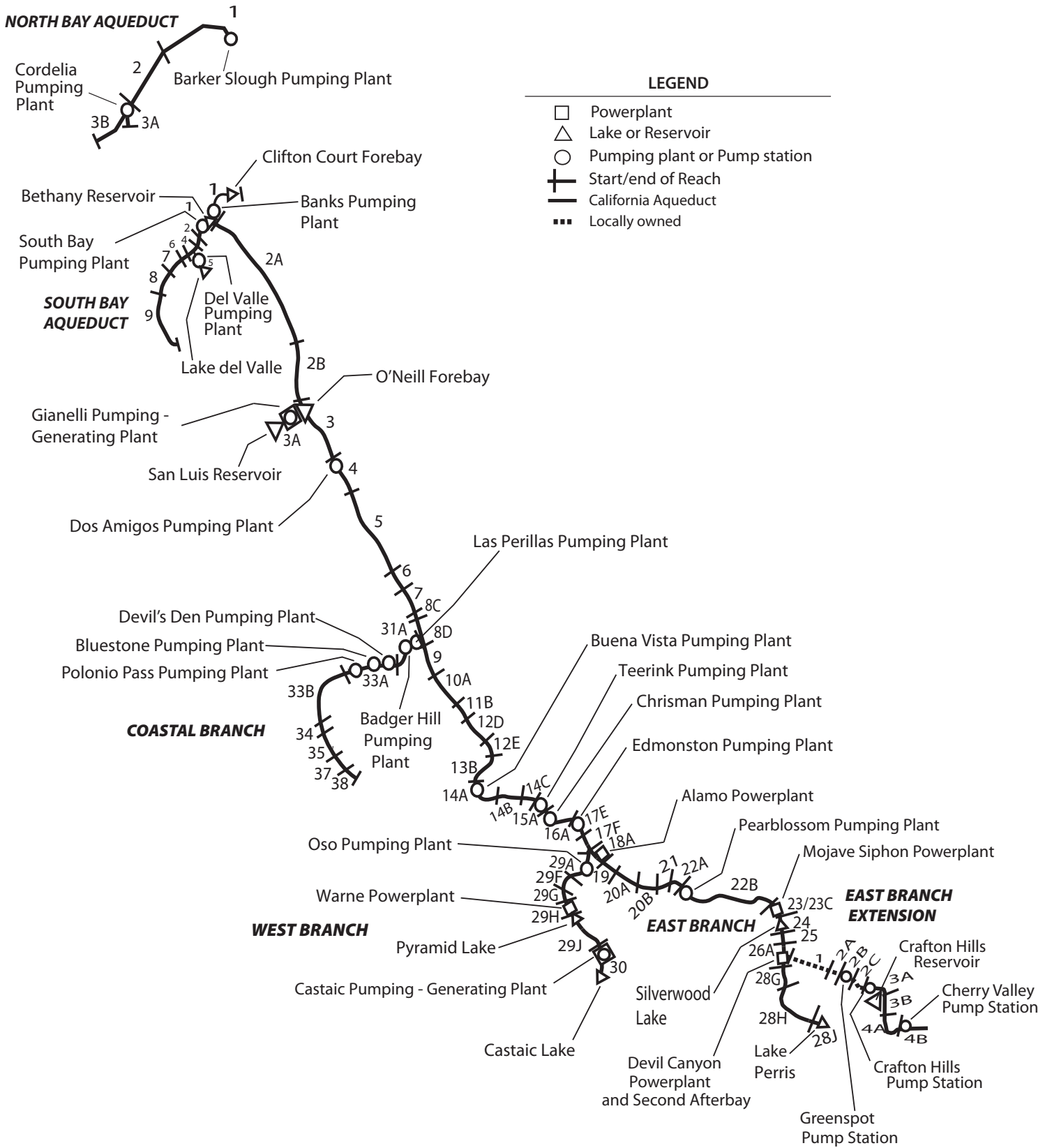


Figure B-4 Repayment Reaches and Descriptions

North Bay Aqueduct

- 1 Barker Slough through Fairfield /Vacaville Turnout
- 2 Fairfield/Vacaville Turnout to Cordelia Forebay
- 3A Cordelia Forebay through Benicia and Vallejo Turnouts
- 3B Cordelia Forebay through Napa Turnout Reservoir

South Bay Aqueduct

- 1 Bethany Reservoir through Altamont Turnout
- 2 Altamont Turnout through Patterson Reservoir
- 4 Patterson Reservoir to Del Valle Junction
- 5 Del Valle Junction through Lake del Valle
- 6 Del Valle Junction through South Livermore Turnout
- 7 South Livermore Turnout through Vallecitos Turnout
- 8 Vallecitos Turnout through Alameda-Bayside No.1 Turnout
- 9 Alameda-Bayside Turnout through Santa Clara Terminal Facilities

California Aqueduct**North San Joaquin Division**

- 1 Delta through Bethany Reservoir
- 2A Bethany Reservoir to Orestimba Creek
- 2B Orestimba Creek to O'Neill Forebay

San Luis Division

- 3A Sisk Dam, San Luis Reservoir, Gianelli Pumping-Generating Plant
- 3 O'Neill Forebay to Dos Amigos Pumping Plant
- 4 Dos Amigos Pumping Plant to Panoche Creek
- 5 Panoche Creek to Five Points
- 6 Five Points to Arroyo Pasajero
- 7 Arroyo Pasajero to Kettleman City

South San Joaquin Division

- 8C Kettleman City through Milham Avenue
- 8D Milham Avenue through Avenal Gap
- 9 Avenal Gap through Twisselman Road
- 10A Twisselman Road through Lost Hills
- 11B Lost Hills to 7th Standard Road
- 12D 7th Standard Road through Elk Hills Road
- 12E Elk Hills Road through Tupman Road
- 13B Tupman Road to Buena Vista Pumping Plant
- 14A Buena Vista Pumping Plant through Santiago Creek
- 14B Santiago Creek through Old River Road
- 14C Old River Road to Teerink Pumping Plant
- 15A Teerink Pumping Plant to Chrisman Pumping Plant
- 16A Chrisman Pumping Plant to Edmonston Pumping Plant

Coastal Branch, California Aqueduct

- 31A Avenal Gap to Devil's Den Pumping Plant
- 33A Devil's Den Pumping Plant through Tank 1
- 33B Tank 1 through Chorro Valley Turnout
- 34 Chorro Valley Turnout through Lopez Turnout
- 35 Lopez Turnout through Guadalupe Turnout
- 37 Guadalupe Turnout to SPRR crossing near Casmalia
- 38 SPRR crossing near Casmalia through terminous at Tank 5 (Outlet Vault)

Tehachapi Division

- 17E Edmonston Pumping Plant to Porter Tunnel
- 17F Porter Tunnel to Junction, West Branch

Mojave Division

- 18A Junction, West Branch through Alamo Powerplant
- 19 Alamo Powerplant to Fairmont
- 19C Buttes Junction through Buttes Reservoir
- 20A Fairmont through 70th Street West
- 20B 70th Street West to Palmdale
- 21 Palmdale to Littlerock Creek
- 22A Littlerock Creek to Pearblossom Pumping Plant
- 22B Pearblossom Pumping Plant to West Fork Mojave River
- 23 West Fork Mojave River to Silverwood Lake
- 23C Mojave Siphon Powerplant
- 24 Cedar Springs Dam and Silverwood Lake

Santa Ana Division

- 25 Silverwood Lake to South Portal, San Bernardino Tunnel
- 26A South Portals San Bernardino Tunnel through Devil Canyon Powerplant and Second Afterbay
- 28G Devil Canyon Powerplant and Second Afterbay to Barton Road
- 28H Barton Road to Lake Perris
- 28J Perris Dam and Lake Perris

East Branch Extension

- 1 Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road
- 2A Junction, Foothill Pipeline near Cone Camp Road to Greenspot Pump Station
- 2B Greenspot Pump Station to Morton Canyon Valve Vault
- 2C Morton Canyon Valve Vault to Crafton Hills Pump Station
- 3A Crafton Hills Pump Station to Carter Street Valve Vault
- 3B Carter Street Valve Vault to Garden Air Creek, South of San Bernardino/Riverside County Line
- 4A Garden Air Creek to Cherry Valley Pump Station
- 4B Cherry Valley Pump Station to Terminus at Noble Creek

West Branch, California Aqueduct

- 29A Junction, California Aqueduct through Oso Pumping Plant
- 29F Oso Pumping Plant through Quail Embankment
- 29G Quail Embankment through Warne Powerplant
- 29H Pyramid Dam and Lake
- 29J Pyramid Lake through Castaic Powerplant
- 30 Castaic Dam and Lake

114,000 acre-feet of the allowable capacity has been transferred. *Table 1* shows the permanent capacity transfers that have taken place since the Monterey Amendment was implemented in 1995.

Table B-1 presents the reach ratios currently applicable to reimbursable capital costs.

Table B-2 presents corresponding ratios for allocating 2013 and after reimbursable minimum OMP&R costs among contractors. Requested excess capacity is omitted when deriving ratios applicable to capital costs because the capital costs for the excess capacity are paid on an incremental-cost basis and not a proportionate-use basis. However, requested excess capacity is accounted for in the ratios applicable to minimum OMP&R costs.

Variable OMP&R Costs

Article 26(a) includes provisions to ensure that the variable OMP&R component of the Transportation Charge will result in a return to the State of those costs that depend on and vary with the amount of SWP water deliveries. (The minimum OMP&R component results in a return of those operating costs that do not vary with deliveries.) Under Article 26(a) all such costs for a reach for a given year will be allocated among contractors in proportion to the actual annual use of that reach by the respective contractors.

Table B-3 summarizes the total power costs, credits, and transmission costs for each aqueduct pumping and power recovery plant. Variable costs are the following:

- Costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service costs that are independent and vary with

power usage are classified as minimum OMP&R costs).

- Credits for capacity and energy produced at aqueduct power recovery plants (treated as negative costs).
- Payments for replacement of major plant machinery components having economic lives shorter than the project repayment period. (In 1997, DWR discontinued charging for a sinking fund for replacements. Replacement costs, for 1999 and thereafter, are to be paid on an annual basis as the costs are incurred.)
- Beginning in 2005, a portion of transmission expenditures that will depend on and vary with water and power usage. These costs will be included as part of the variable component.

Table B-3 excludes plant capacity and energy costs associated with surplus and unscheduled water service after May 1, 1973. Prior to that date, surplus water service was charged the same unit variable OMP&R component as allocated water service. An amendment to the long-term water supply contracts in 1973 significantly changed the rate structure for surplus water service. Capacity and energy costs for pumping surplus and unscheduled water were allocated directly to those water contractors receiving surplus and unscheduled water service. A contract amendment in 1991 again revised the rate structure to provide for payment of costs through a melded power rate. These revisions to charges for surplus and unscheduled water are effective from the date of the amendments and are not applied to past charges.

An interruptible water program was established in 1994. This program, later renamed to Article 21 program, is based on individual annual contracts; costs for Article 21 water actually delivered are included in *Table B-3*.

Table 1 Summary of Permanent Aqueduct Capacity Transfers

Contractor		Capacity Transfer		Transfer Description
Seller	Buyer	Amount (af)	Effective Year	
Transfers under Monterey Amendment				
Kern	Mojave	25,000	1998	Purchased capacity upstream from Reach 31A
Kern	Castaic Lake	41,000	2000	Purchased capacity upstream from Reach 16A
Kern	Palmdale	4,000	2000	Purchased capacity upstream from Reach 11B
Kern	Alameda-Zone 7	7,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	15,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	10,000	2001	Purchased capacity upstream from Reach 11B
Kern	Solano	5,756	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Napa	4,025	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Alameda-Zone 7	2,219	2004	Purchased capacity upstream from Reach 11B
<i>Subtotal under Article 53</i>		<i>114,000</i>		
Transfers outside of Monterey Amendment				
Tulare	Dudley Ridge	3,973	2002	Purchased capacity upstream from Reach 8D
Tulare	AVEK	3,000	2002	Purchased capacity upstream from Reach 8D
Tulare	Alameda-Zone 7	400	2003	Purchased capacity upstream from Reach 8D
Tulare	Kings	5,000	2004	Purchased capacity upstream from Reach 8D
Tulare	Coachella	9,900	2004	Purchased capacity upstream from Reach 8D
MWDSC	Coachella	88,100	2005	Purchased capacity upstream from Reach 28J
MWDSC	Desert	11,900	2005	Purchased capacity upstream from Reach 28J
Tulare	Kings	305	2006	Purchased capacity upstream from Reach 31A
Tulare	Desert	1,750	2010	Purchased capacity upstream from Reach 17F
Tulare	Coachella	5,250	2010	Purchased capacity upstream from Reach 17F
Kern	Desert	4,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Kern	Coachella	12,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Dudley Ridge	Mojave	7,000	2010	Purchased capacity upstream from Reach 8D
<i>Subtotal outside of Article 53</i>		<i>152,578</i>		

Water Conveyance

Tables B-4, B-5A, B-5A-Adj, B-5B, and B-6 present water conveyance quantities that form the basis for allocating costs.

Table B-4 presents the schedules of annual allocations as set forth in Table A and Article 6(a) of each water supply contract.

Table B-5A shows amounts of actual and projected allocated water quantities delivered from each aqueduct reach to each contractor. Projected deliveries for

years 2012 through 2035 are based on contractors' requests for future water deliveries. The quantities included in Table B-5A also include nonproject water delivered to contractors and surplus water deliveries prior to May 1, 1973, and actual Article 21 water deliveries in 1994 and after.

Table B-5A-Adj presents a summary of accounting adjustments that result from water deliveries not originating from the Sacramento-San Joaquin Delta. The methodologies used to calculate various components are based on cumulative

charges from the Delta through facilities conveying water to a specific repayment reach. When water is introduced to the SWP downstream of the Delta, contractors require an adjustment, or credit, for those facilities not used to convey the water.

Table B-5B presents a summary of actual and projected annual allocated water quantities for each contractor. The quantities also include amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and after.

Table B-6 summarizes the annual allocated water quantities conveyed or to be conveyed through each aqueduct pumping plant or power plant for each of the following functions:

- *Deliveries-Water Supply.* Water made available to contractors at down-aqueduct delivery structures, including certain hypothetical quantities to facilitate cost allocations, for those years when deliveries are made from net annual storage withdrawals. The net annual amounts of storage withdrawals are hypothetically added to the actual amounts conveyed from the Delta to the reservoirs, since deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were actually conveyed from the Delta in that year. The hypothetical increases in the deliveries made from reservoir storage withdrawals are offset by equal credits to the minimum OMP&R costs of the respective reservoirs. Thus, the variable OMP&R components per acre-foot (*Table B-17*) may be applied to the total annual quantities delivered either from aqueduct reservoir storage or from the Delta.
- *Initial Fill Water.* Water required for initial filling of down-aqueduct reaches and reservoirs or for repayment of pre-consolidation water used during construction.
- *Deliveries-Recreation.* Water delivered to down-aqueduct recreation developments or used for fish and wildlife enhancement.
- *Operational Losses.* Water lost through evaporation and seepage from all down-aqueduct reaches.
- *Reservoir Storage Changes.* Water placed in down-aqueduct reservoir storage after initial filling of the reservoirs, including projected net annual storage accretions (positive values) and withdrawals (negative values) for all down-aqueduct reservoirs of the Project Transportation Facilities.

Variable OMP&R costs (*Table B-12*) that are allocable to storage accretions are assigned to the minimum OMP&R costs of the respective reservoirs. With the exception of Banks Pumping Plant, "Reservoir Storage Changes" also includes SWP water placed into Southern California groundwater storage from 1978 through 1982 (as positive amounts); and water withdrawn from storage and delivered to contractors in 1979, 1982, 1987, 1988, and 1989 (as negative amounts). At Banks Pumping Plant, groundwater additions and withdrawals are included in "Conservation Water."

Table B-6 also summarizes the following two amounts under the heading "Conservation Water" (Column 25):

1. Net annual water amounts stored and projected to be stored in San Luis Reservoir.
2. Water lost and projected to be lost through evaporation and seepage from San Luis Reservoir and from the water conservation portion of the California Aqueduct.

"Conservation Water" includes initial fill water, operational losses, and net annual

storage changes associated with San Luis Reservoir and the portion of the California Aqueduct that is allocated to conservation. The same allocation procedure outlined previously for Transportation Facilities also applies to water delivered from storage in Conservation Facilities, except that the hypothetical cost increases are added to the variable OMP&R cost to be reimbursed through the Transportation Charge and deducted from the minimum OMP&R costs to be reimbursed through the Delta Water Charge.

San Luis Reservoir is operated to conserve water for future delivery to downstream contractors. To account for costs associated with reservoir storage, the power and replacement costs of Banks Pumping Plant (a joint Transportation-Conservation Facility) that are allocated to the conveyance of annual conservation water quantities are transferred to the capital costs of San Luis Reservoir (during initial fill) or to the minimum OMP&R costs of San Luis Reservoir (following initial fill).

In years of net storage withdrawal from San Luis Reservoir, a portion of the minimum OMP&R cost of the reservoir is transferred to the variable OMP&R cost of Banks Pumping Plant. That transfer is equal to the variable OMP&R cost per acre-foot of delivery through Banks Pumping Plant for that year, multiplied by the acre-feet of deliveries derived from San Luis Reservoir storage for that year. *Table B-6* also includes amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and thereafter.

Bases for Reimbursable Costs

This section describes the methods used to derive the costs allocated by the procedures outlined in the preceding section. A diagram

of the cost derivation process is shown in the upper-left quadrant of Figure B-1.

First, the capital and minimum OMP&R costs of all SWP facilities are allocated among the various project purposes in accordance with the allocation percentages in *Table 2*. Those percentages may be subject to revision in the future.

The redeterminations in this appendix involve only the SWP costs that are allocated to water supply and power generation.

Capital Costs

Capital costs used in the redeterminations in this appendix reflect prices prevailing on December 31, 2011; future cost escalation will be reflected in subsequent bulletins.

Table B-7 presents a reconciliation of estimated total capital costs of each Project Conservation Facility and each Project Transportation Facility. This table shows the relationship of Project Conservation and Transportation costs allocated to contractors (*Tables B-8, B-9, B-10 and B-13*) to the total SWP capital costs projected by DWR.

Table B-8 shows costs incurred and projected to be incurred by the State in connection with each contractor's turnouts. Costs incurred by the State for both State-constructed and contractor-constructed delivery structures are paid directly by the contractors for which the structures are built. The State incurs design review and construction inspection costs in connection with contractor-constructed turnouts.

Table B-9 lists costs and payments for excess capacity built into SWP Transportation Facilities in accordance with amendments to contracts with Metropolitan Water District of Southern California (Metropolitan), San

Table 2 Project Purpose Cost Allocation Factors (Percentages)

PROJECT FACILITIES	Water Supply and Power Generation		All Other Purposes (Nonreimbursable)	
	Capital Costs	Minimum OMP&R Costs	Capital Costs	Minimum OMP&R Costs
Project Conservation Facilities				
Frenchman Dam and Lake	21.5	0.0	78.5	100.0
Antelope Dam and Lake	0.0	0.0	100.0	100.0
Grizzly Valley Dam and Lake Davis	1.0	1.8	99.0	98.2
Oroville Division ^(a)	97.1	99.5	2.9	0.5
California Aqueduct, Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Delta Facilities				
Peripheral Canal Related	86.0	86.0	14.0	14.0
Remaining of Delta Facilities	96.6	96.7	3.4	3.3
Transportation Facilities				
Grizzly Valley Pipeline	100.0	100.0	0.0	0.0
North Bay Aqueduct	100.0	100.0	0.0	0.0
South Bay Aqueduct				
Del Valle Dam and Lake del Valle	25.2	22.0	74.8 ^(b)	78.0 ^(c)
Remainder of South Bay Aqueduct	100.0	100.0	0.0	0.0
California Aqueduct				
Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Dos Amigos Pumping Plant to termini (excluding Coastal Branch)	94.3	96.9	5.7	3.1
Coastal Branch	100.0	100.0	0.0	0.0

^(a)Percentages indicated are applicable to the remaining costs of division after excluding costs allocated to flood control that are reimbursed by the federal government (22 percent of capital costs) and excluding specific power costs of Hyatt and Thermalito Powerplants and switchyards.

^(b)Percentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.

^(c)Percentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

Gabriel Valley Municipal Water District, and Antelope Valley-East Kern Water Agency, including the following:

- Additional costs incurred by the State for requested excess capacity;
- Advances by water contractors of funds for such costs; and
- Credits for advances in excess of costs, which were applied to respective contractors' installments of the capital cost component of the Transportation Charge in 1981.

Under Amendment 2 of Metropolitan's contract, 809 cubic feet per second of excess

capacity was originally constructed in reaches of the West Branch at Metropolitan's request. That capacity was reclassified as basic capacity of SWP Transportation Facilities under Amendment 7. Metropolitan paid \$16.3 million as a prepayment of the capital cost component of the Transportation Charge in lieu of advancing funds for the original requested capacity.

Amendment 5 to Metropolitan's contract requires that additional costs for modifications to the Santa Ana Pipeline (required for enlargement of Lake Perris) will be allocated to Metropolitan and returned to the State through payments of the Transportation Charge. The additional costs

to be repaid through Metropolitan's capital cost component for the aqueduct reach from Devil Canyon Powerplant to Barton Road total about \$6.7 million (see Bulletin 132-72, page 98).

Table B-10 presents the actual and projected annual capital costs of each aqueduct reach that will eventually be returned to the State, with interest, through contractors' payments of the capital cost component of the Transportation Charge and payment of debt service under the Devil Canyon-Castaic contracts.

Annual Operating Costs

Annual operating costs allocable to water supply and power generation are returned to the State through the minimum OMP&R components of the Delta Water Charge and the Transportation Charge and through a portion of the revenues from energy sales. All reimbursable operating costs of Conservation Facilities are included in the minimum OMP&R component of the Delta Water Charge.

Transportation and Devil Canyon-Castaic Contract Costs

Table B-11 shows the amounts of the actual and projected costs to be reimbursed through payments of the minimum OMP&R component of the Transportation Charge and allocated operating costs under the Devil Canyon-Castaic contract. The table includes the following seven types of operating costs incurred annually that do not vary with water quantities delivered to the contractors:

1. All direct labor charges for field operation and maintenance personnel, including associated indirect costs;
2. A distributed share of general operating costs that cannot be identified solely with one facility or aqueduct reach;

3. All of electric power transmission and station service costs up to 2004, and electric power transmission and station service costs for 2005 and after that do not vary with power usage allocable to aqueduct pumping and recovery plants;
4. All costs for equipment, materials, and supplies;
5. Portions of the power and replacement costs of all up-aqueduct pumping plants and power plants that are allocable to the annual conveyance of water lost to evaporation and seepage from respective aqueduct reaches or placed into storage in respective reservoirs of the project transportation facilities (after initial fill);
6. Credits, which offset those costs in (5) above, for deliveries drawn from reservoir storage; and
7. Escalation of projected operating costs at 3.0 percent per year for 2013 and 2014 plus
8. Escalation of projected operating costs at 1 percent per year for 2015-2035.

Table B-12 shows the portions of variable OMP&R costs in *Table B-3* that are allocable to the water supply delivery quantities included in *Table B-6* and reimbursed through payments of the variable OMP&R component of the Transportation Charge.

To derive *Table B-12* costs, the following adjustments are made to *Table B-3* costs:

1. Part of the variable OMP&R costs of each plant is allocated to recreation. The allocation to recreation is in proportion to the quantity of water conveyed through each plant each year for delivery to on-shore recreational developments. That portion of variable plant costs attributable to the initial fill of aqueduct reaches is

allocated to the joint capital costs of respective down-aqueduct reaches and reservoirs.

2. That portion of costs attributable to evaporation and seepage is allocated to the joint minimum OMP&R costs of respective down-aqueduct reaches and reservoirs.
3. Adjustments are made for additions or withdrawals from storage in aqueduct reservoirs. In years when water is added to storage in aqueduct reservoirs, the cost of conveying this water into storage is charged to the minimum OMP&R costs of the corresponding reservoir. In years when storage in aqueduct reservoirs is decreased for the purpose of making deliveries, a credit is applied to the minimum OMP&R costs of the reservoir from which the storage is released. This credit is equal to the number of acre-feet of storage reduction times the variable OMP&R unit rate for the year the storage is released. The unit rate is equal to the variable OMP&R unit rate for the year the water is taken from storage.
4. That portion of costs attributable to pumping water to replace evaporation and seepage losses and for additions or withdrawals from storage in San Luis Reservoir is charged to the minimum OMP&R component of the Delta Water Rate.

The remaining costs are allocated to transportation water supply and repaid by the contractors.

Conservation Capital and Operating Costs

Table B-13 is a summary of actual and projected capital and operating costs of the initial Project Conservation Facilities. These costs are reimbursed through payments by contractors under the Delta Water Charge,

Oroville power sales, and Gianelli Generating Plant credits. *Table B-13* also shows credits applied to the reimbursable capital costs of the Project Conservation Facilities in accordance with negotiated settlements concerning incurred planning costs for the period from 1952 through 1978.

Project Water Charges

This section describes the redetermination of past and projected components of the Transportation Charge for annual revision of Tables C through G of each water supply contract. This section also describes the derivation of the unit Delta Water Rates and the Water System Revenue Bond Surcharge.

A summary of equivalent unit charges for each acre-foot of allocated water service is also included for each contractor and each aqueduct reach. A diagram of all calculations may be found on the lower half of Figure B-1.

Transportation Charges

The accumulation of allocated costs of each aqueduct reach to each contractor is the basis for the Transportation Charge components.

Table B-14 summarizes each contractor's share of the capital costs of the aqueduct reaches presented in *Table B-10*. Those amounts are determined by applying proportionate-use ratios set forth in *Table B-1* to the costs in *Table B-10*. The resulting allocated costs are set forth in *Table C* of the respective water supply contracts.

Prepayments of the capital cost component, required under Metropolitan's Amendment 7, are included as negative capital costs in *Table B-14* and *Table C* of Metropolitan's Statement of Charges. Solano, Empire-West Side Irrigation District, and Castaic Lake

Water Agency also prepaid capital costs (see Table B-14 footnotes). Table B-14 includes costs of the East Branch Extension to provide water service to San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency.

Both Table B-14 and Table C of the six contractors for project water service below Devil Canyon Powerplant and Castaic Powerplant include the capital costs reimbursable under the Devil Canyon-Castaic contract.

Table B-15 summarizes capital cost components of the Transportation Charge for each contractor for each year of the project repayment period. By the year 2035, the capital cost components shown in Table B-15 will recover the costs shown in Table B-14, with interest at the Project Interest Rate of 4.610 percent per annum and based on the amortization schedules included in *Table 3*.

Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table D of the water supply contracts. Costs of excess capacity are billed separately and are not included in Table B-15.

Table B-15 includes the debt service payments due from the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant, in accordance with terms of the Devil Canyon-Castaic contract.

Table B-16A summarizes the minimum OMP&R components of the Transportation Charge for each year of the project repayment period. Those estimated components, subsequently adjusted for prior overpayments or underpayments,

are included in Table E of the respective contracts.

The total amounts included in Table B-16A are determined by applying the proportionate-use ratios in Table B-2 to the reach costs in Table B-11.

Table B-16A excludes Off-Aqueduct Power Facility charges, which are included separately in *Table B-16B*. Both Table B-16A and Table E include the operating costs payable under the Devil Canyon-Castaic contract for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant.

As part of operating agreements with DWR, Kern was billed from 1963 through 1987 for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill Pumping Plants by Berrenda Mesa Water Storage District (see Bulletin 132-71, page 7). Under those agreements, a portion of minimum OMP&R costs of Reach 31A were assigned directly to Kern, as shown in *Table 4*, with the remaining reach costs allocated by application of the proportionate-use ratios. DWR purchased the last unit, Unit No. 6, at Las Perillas and Badger Hill Pumping Plants in early 1997 to provide pumping capacity for deliveries to Coastal Area contractors, which began in 1997.

As a result of the Monterey Amendment, the costs related to this settlement are to be allocated among all SWP contractors in proportion to their maximum Table A amounts. As costs are incurred, related charges will be included in the contractors' annual Statements of Charges as part of the minimum. It is estimated that between 2002 and 2010, the Monterey Amendment litigation costs will be slightly less than \$16 million.

Table 3 Criteria for Amortizing Capital Costs of Transportation Facilities

Contractor	Year of Initial Payment ^(a)
Alameda County Flood Control and Water Conservation District – Zone 7	1963 ^(b)
Alameda County Water District	1963
Antelope Valley—East Kern Water Agency	1963
Castaic Lake Water Agency	1964
City Yuba City	^(c)
Coachella Valley Water District	1964
County of Butte	^(c)
County of Kings	1968
Crestline-Lake Arrowhead Water Agency	1964
Desert Water Agency	1963 ^(d)
Dudley Ridge Water District	1968 ^(e)
Kern County Water Agency	
Agricultural Use	1968 ^(e)
Municipal and Industrial Use	1968 ^(e)
Littlerock Creek Irrigation District	1964
Metropolitan Water District of Southern California	1963
Mojave Water Agency	1964
Napa County Flood Control and Water Conservation District	1966
Oak Flat Water District	1968
Palmdale Water District	1964
Plumas County Flood Control and Water Conservation District	1970
San Bernadino Valley Municipal Water District	1963
San Gabriel Valley Municipal Water District	1963 ^(d)
San Geronio Pass Water Agency	1963 ^(d)
San Luis Obispo County Flood Control and Water Conservation District	1964 ^(f)
Santa Barbara County Flood Control and Water Conservation District	1964
Santa Clara Valley Water District	1963
Solano County Water Agency	1973
Tulare Lake Basin Water Storage District	1968 ^(e)
Ventura County Watershed Protection District	1964

^(a) Allocated capital costs of transportation facilities amortized in equal annual installments unless otherwise noted.

^(b) Principal payments on each annual capital cost prior to 1971 delayed until calendar year 1972, except payments for 1963.

^(c) For Yuba City and Butte County payments for Delta Water Charge only.

^(d) Payment deferred for 1963 and added to 1964 payment with accrued interest.

^(e) For Dudley Ridge, Empire, Kern (agricultural use), Oak Flat, and Tulare, according to Article 45 of the contracts for supply of agricultural water, capital costs of transportation facilities allocated to agricultural water supply are amortized by using an equivalent unit rate per acre-foot applied to the annual allocations (Table B-4) through the project repayment period.

^(f) For San Luis Obispo and Santa Barbara County, all principal and interest payments for costs of the Coastal Stub were deferred until 1976.

Table 4 Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency

Year	Direct Charges
1969	46,511
1970	46,302
1971	140,074
1972	95,017
1973	72,454
1974	100,692
1975	127,456
1976	138,504
1977	120,753
1978	157,652
1979	121,231
1980	150,728
1981	75,866
1982	82,805
1983	90,007
1984	107,468
1985	159,406
1986	137,241
1987	127,073
1988	130,924
1989	128,468
1990	138,234
1991	139,527
1992	185,370
1993	219,334
1994	364,196
1995	272,341
1996	322,123
Total	3,997,767

Table B16-B summarizes annual Off-Aqueduct Power Facility charges allocated to each water contractor, adjusted for prior overpayments or underpayments. Those charges are to repay all Off-Aqueduct Power costs, including bond service, deposits for reserves, operation and maintenance costs, fuel costs, taxes, and insurance.

Adopted October 1, 1979, the General Bond Resolution requires that sufficient revenues be collected each year to repay all of those costs. In addition, an amount totaling 25 percent of the annual bond service is collected each year to ensure that sufficient funds are available to cover all annual costs. Any revenues collected and not needed during the year are refunded to the contractors in the next year.

Table 5 summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 2011. The Reid Gardner Powerplant Separation costs are tracked independently from annual Reid Gardner operating costs in anticipation of the Reid Gardner Powerplant contract expiration in 2013.

Table 5 Summary of 2011 Off-Aqueduct Power Facility Charges and Credits

Charges by Item	(Dollars)
Reid Gardner Powerplant	108,304,722
Reid Gardner Separation Costs	1,783,268
Bottle Rock Powerplant	11,907,030
South Geysers Powerplant	5,536,028
<i>Subtotal</i>	<i>127,531,048</i>
Credits by Item	
Power Sales	(2,014,679)
Net Total Charge	125,516,369

Table 6 shows projected Off-Aqueduct Power Facility charges and an amount equal to 25 percent of annual bond service for 2012 through 2035.

Annual Off-Aqueduct Power Facility charges are allocated among contractors in proportion to the electrical energy required to pump allocated water for the year. The initial allocation for the Statements of Charges is based on estimates of energy to pump requested allocated water deliveries.

An interim adjustment in the allocation of Off-Aqueduct Power costs may be made in May of each year, based on updated cost estimates and April revisions in water delivery schedules. An additional adjustment is made the following year based on actual water deliveries and actual costs for the year.

Table 6 Projected Charges for Off-Aqueduct Power Facilities

Year	Total Annual Cost (Dollars)	25% Bond Cover (Dollars)
2012	139,099,960	12,863,698
2013	73,637,100	7,147,620
2014	19,938,824	3,982,816
2015	11,689,081	2,332,867
2016	10,033,708	2,001,793
2017	9,676,915	1,930,434
2018	3,967,755	788,602
2019	3,947,196	784,490
2020	4,246,764	844,404
2021	6,183,738	1,231,799
2022	5,855,517	1,166,154
2023	4,315,040	858,059
2024	3,229,355	640,922
2025	533,138	101,679
2026	667,201	128,491
2027	998,250	194,701
2028	682,671	131,585
2029	679,508	130,953
2030	203,730	35,797
2031	203,261	35,703
2032	208,542	36,759
2033	206,917	36,434
2034	204,964	36,044
2035	208,933	36,838

The energy required to pump each contractor’s water is calculated using the kilowatt-hour per acre-foot factors shown in *Table 7* for the pumping plants upstream from the delivery turnouts. The amounts shown include transmission losses.

Table 7 Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs

Pumping Plant	kWh per acre-foot ^(a)	
	At Plant	Cumulative from Delta
Barker Slough	223	223
Cordelia-Benicia	434	657
Cordelia-Vallejo	178	401
Cordelia-Napa	563	786
Harvey O. Banks (Delta)	296	296
South Bay (including Del Valle)	869	1,165
Dos Amigos	138	434
Buena Vista	242	676
Teerink	295	971
Chrisman	639	1,610
Edmonston	2,236	3,846
Pearblossom	703	4,549
Greenspot	871	5,420
Crafton Hills	1,087	6,507
Cherry Valley	224	6,731
Oso	280	4,126
Las Perillas	77	511
Badger Hill	200	711
Devil’s Den	705	1,416
Bluestone	705	2,121
Polonio Pass	705	2,826

^aIncludes transmission losses.

Table B-17 presents a summary of actual and projected total variable OMP&R costs for each acre-foot conveyed through each aqueduct pumping plant and power plant for each year of the project. Following are provisions for calculating the variable OMP&R component of the Transportation Charge:

- An annual charge per acre-foot of projected water deliveries to all contractors served from or through each reach is determined so the projected variable OMP&R costs to be incurred for each reach will be returned to the State.

- The total annual variable OMP&R component for any contractor for a given reach is obtained by multiplying the unit charge associated with that reach by the quantity of water actually delivered from or through the reach to the contractor.

The data summarized in Table B-17 are derived by dividing the costs shown in Table B-3 by the water quantities shown in Table B-6. However, certain costs included in Table B-3 for extra peaking service, which would otherwise constitute variable OMP&R costs, are assigned directly to contractors requesting this type of service (see Bulletin 132-71, page 21, and Water Service Contractors Council Memo No. 593, July 10, 1970). Those costs are excluded from the unit charges shown in Table B-17. Peaking charges based on additional capacity ceased in 1983. Since 1984, costs are based on market energy rates. The amounts of extra peaking charges for additional power costs are shown in *Tables 8 and 9* on pages B-22 and B-23, respectively.

Unit rates shown in Table B-17 constitute the rates for the pumping plants and power plants listed. The cumulative rates constitute the total rates, cumulative from the Sacramento-San Joaquin Delta, and are applicable to deliveries from or downstream of the pumping plants and power plants. Extra peaking service costs are excluded.

Table B-18 shows the variable OMP&R components of the Transportation Charge for each contractor for each year of the project repayment period. *Table B-18* is developed from the costs per acre-foot included in *Table B-17* and the delivery quantities for each contractor from each reach as indicated in *Table B-5A* and *Table B-5A-Adj*, plus any costs for extra peaking service. Those estimated components, subsequently adjusted for prior overpayments or

underpayments, are included in *Table F* of the respective water supply contracts.

Table B-19 summarizes the annual Transportation Charges for each contractor (the sums of the corresponding amounts included in *Tables B-15, B-16A, B-16B, and B-18*). Those estimated payments, subsequently adjusted for prior overpayments or underpayments, are set forth in *Table G* of the respective water supply contracts.

In accordance with provisions of the Devil Canyon-Castaic contract, *Table B-19* and *Table G* include amounts of debt service and operating cost payments due from the six contractors located down-aqueduct from Devil Canyon and Castaic powerplants.

Delta Water Charges

Table B-20A presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 2013 in accordance with the amended Article 22(e) and 22(g) of all 29 contracts. The Delta Water Rate was calculated at a Project Interest Rate of 4.610 percent, based on Conservation Facility costs shown in *Table B-13*. That Delta Water Rate is used to compute projected Delta Water Charges under Article 53(i) for the contractors who have executed the Monterey Amendment. Included in *Table B-20A* is the Delta Water Rate for the two contractors who have not executed the Monterey Amendment: Plumas County Flood Control and Water Conservation District and Empire West Side Irrigation District.

Table B-20B shows each component of the 2013 Delta Water Rate from *Table B-20A*.

Table B-21 summarizes the annual Delta Water Charge for each contractor. The projected charges in *Table B-21* are developed by multiplying the total rate

Table 8 Extra Peaking Charges for Additional Power, by Pumping Plant (Dollars)

Year	Las Perillas and Badger Hill											Total			
	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Badger Hill	Buena Vista	Teerink	Chrisman	Edmonston		Pearblossom	Oso	
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	45,145	3,680	0	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	12,126	0	0	0	0	0	0	0	0	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,594	3,534	152	0	0	0	0	0	0	0	11,315
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	0	0	0	0	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	0	0	76,878
1986	0	0	0	0	1,864	863	0	291	354	766	2,683	0	0	0	6,821
1987	0	0	0	604	17,129	7,838	835	2,295	1,806	3,460	11,058	0	0	0	45,025
1988	639	39	287	894	43,475	20,082	2,213	5,792	4,367	8,272	25,886	0	0	0	111,946
1989	2,491	566	1,483	70	40,251	18,642	1,935	3,401	1,531	2,058	3,793	0	0	0	76,221
1990	45	0	18	343	19,524	9,044	0	150	145	314	643	0	0	0	30,226
1991	903	0	281	0	21	8	0	15	17	39	139	41	0	0	1,464
1992	208	117	203	0	7,070	2,502	0	182	190	435	0	0	0	0	10,907
1993	0	681	889	4,483	123,080	54,741	0	8,898	5,458	10,900	35,068	11,139	0	0	255,337
1994	0	366	393	679	6,566	2,795	454	1,083	155	357	1,121	0	132	0	14,101
1995	0	0	0	1,717	24,464	9,422	27	1,865	3,475	782	1,104	400	0	0	43,256
1996	4	0	1	1,983	10,031	4,976	0	391	432	1,015	3,404	1,160	0	0	23,397
1997	0	1,780	2,152	3,107	337,357	165,774	1,753	34,604	12,296	15,910	21,028	0	0	0	595,761
1998	0	0	0	20,966	235,693	106,251	2,354	697	848	1,836	6,426	0	0	0	375,071
1999	0	0	0	0	63,196	26,235	0	3,394	4,136	8,959	31,350	7,740	0	0	145,010
2000-															
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,290	3,549	5,707	38,457	1,041,323	637,838	70,909	78,719	43,445	67,625	172,056	20,480	132	0	2,184,530

Table 9 Extra Peaking Charges for Additional Power, by Contractor (Dollars)

Year	Napa	Solano	Alameda Zone 7	Alameda County	Santa Clara	Dudley Ridge	Empire	Kern	Kings	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella	Desert	Littlerock	Palmdale	San Gabriel	Total
1972	0	0	0	0	0	0	0	35,269	0	0	10	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	0	0	6,891	0	0	0	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	2,035	0	44,484	42	0	0	2,264	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	0	2,821	0	0	0	0	485	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	11,951	0	0	0	0	0	0	0	175	0	0	12,126
1982	0	0	0	0	0	2,173	0	80,945	0	0	0	4,671	1,128	0	0	0	0	422	89,339
1983	0	0	0	0	48	9,511	0	0	1,365	0	0	0	391	0	0	0	0	0	11,315
1984	0	0	0	0	2,874	0	0	144,021	281	809	0	0	2,906	0	0	0	0	0	150,891
1985	0	0	0	2,029	0	0	64	25,664	0	98	0	48,767	256	0	0	0	0	0	76,878
1986	0	0	0	0	0	0	0	0	0	13	2,194	4,614	0	0	0	0	0	0	6,821
1987	0	0	229	0	599	313	84	24,141	0	95	0	18,207	545	0	0	812	0	0	45,025
1988	892	73	665	561	0	1,853	1,404	58,905	0	72	2,368	44,526	627	0	0	0	0	0	111,946
1989	3,478	1,062	96	0	0	13	403	55,085	0	239	8,278	0	1,043	0	0	1,035	5,489	0	76,221
1990	63	0	470	0	0	0	0	28,587	0	0	0	0	0	0	0	81	1,025	0	30,226
1991	1,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	0	1,464
1992	271	257	0	0	0	0	49	10,109	221	0	0	0	0	0	0	0	0	0	10,907
1993	0	1,570	6,122	0	0	0	3,757	97,812	504	0	74,577	0	0	24,983	41,156	0	4,856	0	255,337
1994	0	759	896	0	0	0	7	9,933	0	0	0	0	2,450	0	0	56	0	0	14,101
1995	0	0	2,353	0	0	10,197	0	28,085	310	0	0	0	27	0	0	0	2,284	0	43,256
1996	5	0	81	2,612	0	334	205	4,552	969	0	7,809	0	0	0	0	0	3,598	3,232	23,397
1997	0	3,932	3,999	0	0	6,190	0	546,733	0	40	0	0	0	0	0	0	34,867	0	595,761
1998	0	0	19,666	8,442	0	22,631	1	312,626	0	651	0	0	0	0	0	0	11,054	0	375,071
1999	0	0	0	0	0	0	0	76,425	0	0	6,922	0	0	0	0	0	11,576	50,087	145,010
2000-2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,893	7,653	34,577	13,644	3,521	55,250	5,974	1,620,176	3,692	2,017	102,158	123,049	9,858	24,983	41,156	2,439	74,749	53,741	2,184,530

per acre-foot, as shown in Table B-20A, by the amount of allocated water for each contractor, as shown in Table B-4.

The projected Delta Water Charges from 2013-2035 include the following assumptions:

1. *Escalation of projected operating costs at 3.0 percent per year for 2013 and 2014.*
2. *Escalation of projected operating costs at one percent per year for 2015-2035.*

Water System Revenue Bond Surcharge

Table B-22 summarizes the Water System Revenue Bond Surcharge (WSRB) to the Delta Water Charge and the transportation capital cost component for each contractor. The surcharge shown in Table B-22 includes the financing costs of the WSRB surcharge, Series B through Series AE. This surcharge is levied according to an amendment to the water supply contracts, which was signed by all long-term water supply contractors.

Total Water Charges

Table B-23 summarizes the total annual charges to each contractor (the sum of the Transportation Charge in Table B-19, the Delta Water Charge in Table B-21, and the Water System Revenue Bond Surcharge in Table B-22). The charges do not reflect past payments by contractors and are unadjusted for prior overpayments or underpayments.

Equivalent Total Water Charges

Table B-24 presents the Transportation Charge and Delta Water Charge in terms of the equivalent unit charge for each acre-foot of allocated water now projected for delivery to the respective contractors.

These equivalent charges would provide the same principal sum at the end of the project repayment period as annual payments to be made as part of the Delta Water Charge and Transportation Charge, plus interest at the Project Interest Rate, if applied to each acre-foot of allocated water delivered to date; all surplus water delivered prior to May 1, 1973; all Article 21 water deliveries in 1994 and after; and all allocated water now projected to be delivered during the remainder of the project repayment period (Table B-5B).

The equivalent unit Delta Water Charges included in Table B-24 are greater than those presented in Table B-20A because current projections of allocated water service are less for most contractors than the amounts shown in Table A.

Equivalent Water Costs by Reach

Table B-25 presents a summary of the equivalent unit transportation cost of conveying allocated water through respective aqueduct reaches of the Project Transportation Facilities.

Those unit costs provide the basis of charges assessed for extra service (such as delivery of allocations down-aqueduct from a contractor's turnout) and for wheeling service to entities other than the long-term water supply contractors.

The cumulative unit conveyance costs indicated for reaches in Table B-25 do not necessarily equal the equivalent unit Transportation Charges to contractors served from such reaches. The unit charges in Table B-24 account for the rate of water demand buildup and cost allocation factors of the individual contractors; however, the unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all contractors whose allocations are conveyed through a given

reach. Table B-25 also includes surplus water delivered prior to May 1, 1973, and Article 21 water deliveries in 1994 and afterwards.

East Branch Enlargement Facility Charges

Table B-26 reflects DWR's projection of annual capital costs of the East Branch Enlargement Facilities for each aqueduct reach. These projections will be redetermined in future bulletins to include the following:

- A reallocation of costs of constructing the present east branch facilities between Alamo Powerplant and Silverwood Lake;
- A reallocation of costs of Silverwood Lake to reflect additional use as a result of East Branch Enlargement operation;
- A reallocation of costs of San Bernardino Tunnel to reflect redistribution of flow capacities necessary for the East Branch Enlargement facilities; and
- Actual enlargement construction costs.

These costs will be recovered with interest from the seven Southern California water contractors participating in the enlargement, in accordance with their amended water supply contracts (see *Table 10*).

Table B-27 lists the projected minimum OMP&R costs for each reach of the enlargement to be repaid by the seven East Branch Enlargement participating contractors. Currently, this table includes only minimum OMP&R costs attributable to the East Branch Enlargement. In accordance with Article 49(e)(1), the contractors participating in the East Branch Enlargement will also share in the remaining minimum OMP&R costs of the affected reaches, in accordance with a formula developed by DWR in consultation with the affected contractors.

Table B-28 shows each participating contractor's share of the estimated capital costs of the East Branch Enlargement shown in *Table B-26*.

Table B-29 shows the amounts of the annual capital cost components of the East Branch Enlargement Transportation Charge for each participating contractor. This component consists of each contractor's allocated share of debt service on bonds sold to finance the enlargement.

Table B-30 shows the minimum OMP&R components of the East Branch Enlargement Transportation Charge for each participating contractor for each year of the project repayment period. The amounts shown in *Table B-30* will recover the minimum OMP&R costs shown in *Table B-27*.

Table B-31 shows the annual East Branch Enlargement Transportation charges for each participating contractor (the sum of the corresponding amounts included in *Tables B-29* and *B-30*).

East Branch Extension Phase I Facility Charges

The East Branch Extension-Phase I charges recover associated costs for East Branch Extension facilities beginning at Devil Canyon Powerplant Afterbay and extending to the terminus at Noble Creek in the vicinity of Beaumont, Riverside County. These costs will be recovered from two contractors—San Bernardino and San Gorgonio—in accordance with their amended Water Supply contracts. The factors for distributing costs are shown in *Table 11*. *Table 12* shows the debt service for 2013.

Short-Term Agreements

DWR and the long-term water supply contractors execute short-term agreements that affect the contractors' charges. DWR executed a five-year agreement in 1997 with 16 municipal and industrial contractors, who agreed to pay for allocated shares of Municipal Water Quality Investigations costs. Additional amendments were executed in 2002, 2006, 2008 and 2010 to extend the program. The MWQI charges under this agreement are included in the transportation minimum OMP&R components shown in Table B-16A.

Nine contractors executed a short-term agreement (1997 and 1998) to participate in the feasibility study for the American Basin conjunctive-use program. Feasibility study costs are included in Table B-16A.

Contractors have agreed to participate in several Delta Improvement programs that started in 2007 and that will possibly extend into the future.

The first agreement pertains to the Bay Delta Conservation Plan (BDCP) agreed to in the Memorandum of Agreement for Supplemental Funding for Certain Ecosystem Actions and Support for Implementation of Near-Term Water Supply, Water Quality, Ecosystem, and Levee Actions (MOA). The BDCP comprises two elements: fishery costs and consultation costs. These costs were added to the contractors' transportation minimum component for bill years 2007, through 2012.

The second agreement pertains to the non-BDCP costs of the MOA, comprising the Delta Vision and pelagic organism decline research costs. These costs were added to the contractors' conservation minimum component for bill years 2007 and 2008.

The third set of agreements pertains to the Delta Habitat Conservation and Conveyance Program (DHCCP). The agreements are between the Department and 20 participating SWP contractors to provide 50 percent of the funding for the preliminary planning phase of an improved Delta water conveyance facility. (The remaining 50 percent is provided by the U.S. Bureau of Reclamation.) This program will assess potential habitat restoration and water conveyance options in the Delta. For bill years 2008 through 2011, nearly \$70 million in charges associated with the DHCCP were billed directly to the 20 participating SWP contractors as a separate line item in the Statements of Charges, and are not reflected in the tables in this appendix.

A fourth set of agreements pertains to both DHCCP and BDCP. For bill years 2012 and 2013, an Agreement for Supplemental Funding for the Costs of Environmental Analysis, Planning and Design of Delta Conservation Measures, Including Delta Conveyance Options, was executed in 2012 between the Department and 16 participating SWP contractors to provide 50 percent of the project funding. In 2012, \$22 million was billed and in 2013, \$28 million will be billed directly to the 16 participating contractors as a separate line item in the statements of charges.

Table 10 Determination of Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities among Participating Contractors

Reach Number	Description
18A	Junction, West Branch, California Aqueduct, through Alamo Powerplant
19	Alamo Powerplant to Fairmont
20A	Fairmont through 70th Street West
20B	70th Street West to Palmdale
21	Palmdale to Littlerock Creek
22A	Littlerock Creek to Pearblossom Pumping Plant
22B	Pearblossom Pumping Plant to West Fork Mojave River
23B	West Fork Mojave River to Silverwood Lake (excluding Mojave Siphon Powerplant facilities)
23C	Mojave Siphon Powerplant facilities
24	Cedar Springs Dam and Silverwood Lake
25	Silverwood Lake to South Portal, San Bernardino Tunnel
26A	South Portal, San Bernardino Tunnel through Devil Canyon Powerplant
26B	Devil Canyon Powerplant Bypass

Share of Enlargement Capacity (cfs)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A		151	13	136	6		1,200	1,506
19		151	13	136	6		1,200	1,506
20A	35	151	13	136	6		1,200	1,541
20B	35	151	13	136	6		1,200	1,541
21	35	151	13	136			1,200	1,535
22A	35	151	13	136			1,200	1,535
22B		151	13	136			1,200	1,500
23B		184	67	212			1,200	1,663
23C		184	67				1,200	1,451
24		190	78				1,200	1,468
25		193	83			63	1,200	1,539
26A		193	83			63	1,200	1,539
26B							300	300

Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities (flow ratios)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
19	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
20A	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
20B	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
21	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22A	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22B	0.00000000	0.10066667	0.00866667	0.09066667	0.00000000	0.00000000	0.79999999	1.00000000
23B	0.00000000	0.11064342	0.04028863	0.12748046	0.00000000	0.00000000	0.72158749	1.00000000
23C	0.00000000	0.12680910	0.04617505	0.00000000	0.00000000	0.00000000	0.82701585	1.00000000
24	0.00000000	0.12942779	0.05313351	0.00000000	0.00000000	0.00000000	0.81743870	1.00000000
25	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26A	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26B	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	1.00000000	1.00000000

Table 11 Factors for Distributing Capital and Minimum OMP&R Costs of the East Branch Extension Facilities

Reach Number	Reach Description	San Bernardino Municipal Water District	San Gorgonio Pass Water Agency	Total
Capital				
all	Average of the contractors' participation of EBX facilities	0.458417	0.541583	1.000000
Minimum				
1	Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road	0.557330	0.442670	1.000000
2A	Junction Foothill Pipeline near Cone Camp Rd to Greenspot Pump Station	0.557330	0.442670	1.000000
2B	Greenspot Pump Station to Morton Canyon Valve Vault	0.777778	0.222222	1.000000
2C	Morton Canyon Valve Vault to Crafton Hills Pump Station	0.777778	0.222222	1.000000
3A	Crafton Hills Pump Station to Carter Street Valve Vault	0.557330	0.442670	1.000000
3B	Carter Street Valve Vault to Garden Air Creek, South of San Bernardino County Line	0.557330	0.442670	1.000000
4A	Garden Air Creek to Cherry Valley Pump Station		1.000000	1.000000
4B	Cherry Valley Pump Station to Terminus at Noble Creek		1.000000	1.000000

Table 12 East Branch Extension Facilities Debt Service for 2013

Contractor	Share of Participation (%)	Total Debt Service Charge (Dollars)
San Bernardino	45.84170	7,183,125
San Gorgonio	54.15830	8,486,287
Total	100.00000	15,669,412

Tables B-1 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors^a

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
NORTH BAY AQUEDUCT								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29667896	0.70332104					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
SOUTH BAY AQUEDUCT								
1	Bethany Reservoir thru Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.22599658	0.20663059	0.49237783	0.07499500	1.00000000
4	Patterson Reservoir to del Valle Junction			0.19504795	0.21450017	0.51113249	0.07931939	1.00000000
5	Del Valle Junction thru Lake del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.01285827	0.00528315	0.00133612	0.00871300
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.01343201	0.00552068	0.00139620	0.00910474
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.01345351	0.00552831	0.00139814	0.00911733
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.01345294	0.00552772	0.00139798	0.00911637
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.01345233	0.00552710	0.00139784	0.00911536
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.01345157	0.00552633	0.00139763	0.00911409
6	Five Points to Arroyo Pasaiero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasaiero to Kettleman City	0.00557189	0.01027949	0.03072428	0.01345006	0.00552480	0.00139723	0.00911154
8C	Kettleman City thru Milham Avenue	0.00557103	0.01027792	0.03071961	0.01344960	0.00552432	0.00139712	0.00911076
8D	Milham Avenue thru Avenal Gap	0.00568611	0.01049020	0.03135418	0.01373353	0.00563986	0.00142632	0.00930130
9	Avenal Gap thru Twisselman Road			0.03426625	0.01356094	0.00616886	0.00156011	0.01017373
10A	Twisselman Road thru Lost Hills			0.03481391	0.01377767	0.00626946	0.00158556	0.01033963
11B	Lost Hills to 7th Standard Road			0.03835043	0.01517717	0.00691699	0.00174933	0.01140749
12D	7th Standard Road thru Elk Hills Road			0.04031661	0.01595523	0.00727790	0.00184059	0.01200265
12E	Elk Hills Road thru Tupman Road			0.04037074	0.01597665	0.00728878	0.00184332	0.01202059
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.01733322	0.00791595	0.00200194	0.01305492
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04599288	0.01820137	0.00831952	0.00210399	0.01372049
14B	Santiago Creek thru Old River Road			0.04682530	0.01853084	0.00847388	0.00214303	0.01397505
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.01941356	0.00888679	0.00224744	0.01465600
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.02014241	0.00922722	0.00233351	0.01521742
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.02109050	0.00967107	0.00244575	0.01594937
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05340725	0.02113537	0.00969176	0.00245098	0.01598349
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112	0.02399391	0.02399391	0.00606795	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Litterlock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Litterlock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04680843
22B	Pearblossom Pumping Plant to West Fork Mojave River					0.02827552	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake					0.00324449	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake					0.01024605	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.					0.03544337		
29F	Oso Pumping Plant thru Quail Embankment					0.03544339		
29G	Quail Embankment thru Warne Powerplant					0.03544339		
29H	Pyramid Dam and Lake					0.02817144		
29J	Pyramid Lake thru Castaic Powerplant					0.03544338		
30	Castaic Dam and Lake					0.02927284		
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503			0.07364766		
33A	Devil's Den Pumping Plant through Tank 1	0.10101221	0.89898779					
33B	Tank 1 through Chorro Valley Turnout	0.09912818	0.90087182					
34	Chorro Valley Turnout through Lopez Turnout	0.05479573	0.94520427					
35	Lopez Turnout through Guadalupe Turnout		1.00000000					

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors^a

Reach No.	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
				Municipal and Industrial	Agricultural			
CA-AQ								
1	0.01707770	0.00088678	0.00254693	0.02741768	0.30629913	0.00090695	0.00167121	0.03504975
2A	0.01781031	0.00092482	0.00266258	0.02864263	0.31945188	0.00094747	0.00174288	0.03655331
2B	0.01785838	0.00092731	0.00266550	0.02868743	0.32030556	0.00094896		0.03665201
3	0.01786337	0.00092757	0.00266499	0.02868589	0.32039254	0.00094892		0.03666225
4	0.01786863	0.00092785	0.00266446	0.02868428	0.32048398	0.00094886		0.03667303
5	0.01787517	0.00092819	0.00266380	0.02868227	0.32059816	0.00094879		0.03668649
6	0.01788508	0.00092870	0.00266279	0.02867923	0.32077093	0.00094868		0.03670685
7	0.01788826	0.00092887	0.00266246	0.02867825	0.32082633	0.00094864		0.03671338
8C	0.01789228	0.00092909	0.00266205	0.02867702	0.32089625	0.00094859		0.03672162
8D	0.01828779		0.00271703	0.02928147	0.32798200			0.01820857
9				0.03204523	0.32739538			
10A				0.03257442	0.31658608			
11B				0.03597398	0.24684668			
12D				0.03787171	0.20804762			
12E				0.03793198	0.20695175			
13B				0.01458796	0.16600071			
14A				0.00620338	0.13319181			
14B				0.00632023	0.11741558			
14C				0.00651962	0.09039633			
15A				0.00663252	0.07516317			
16A				0.00688973	0.04028829			
17E				0.00212516				
31A			0.05046240		0.57546190			

Reach No.	SOUTHERN CALIFORNIA AREA (continued)								Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronimo Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	
CA-AQ									
1	0.00049180	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.43929350	0.00429212	1.00000000
2A	0.00051413	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.45921072	0.00448701	1.00000000
2B	0.00051469	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.45973548	0.00449194	1.00000000
3	0.00051461	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.45965407	0.00449108	1.00000000
4	0.00051451	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.45956848	0.00449019	1.00000000
5	0.00051440	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.45946161	0.00448907	1.00000000
6	0.00051419	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.45929991	0.00448738	1.00000000
7	0.00051413	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.45924807	0.00448685	1.00000000
8C	0.00051405	0.01150938	0.00385821	0.02470716	0.00679941	0.00416576	0.45918261	0.00448616	1.00000000
8D	0.00052466	0.01174718	0.00393793	0.02522383	0.00694100	0.00425288	0.46868533	0.00457883	1.00000000
9	0.00057339	0.01283841	0.00430367	0.02758959	0.00758975	0.00465175	0.51227887	0.00500407	1.00000000
10A	0.00058254	0.01304366	0.00437246	0.02803943	0.00771262	0.00472760	0.52049091	0.00508405	1.00000000
11B	0.00064171	0.01436906	0.00481665	0.03093503	0.00850448	0.00521581	0.57349473	0.00560046	1.00000000
12D	0.00067463	0.01510596	0.00506361	0.03254889	0.00894541	0.00548790	0.60297374	0.00588755	1.00000000
12E	0.00067553	0.01512626	0.00507040	0.03259749	0.00895830	0.00549608	0.60379667	0.00589546	1.00000000
13B	0.00073290	0.01641098	0.00550099	0.03540212	0.00972547	0.00596896	0.65516902	0.00639604	1.00000000
14A	0.00076961	0.01723325	0.00577656	0.03720681	0.01021819	0.00627322	0.68807273	0.00671639	1.00000000
14B	0.00078354	0.01754538	0.00588113	0.03789703	0.01040613	0.00638960	0.70057530	0.00683798	1.00000000
14C	0.00080743	0.01808019	0.00606036	0.03907670	0.01072763	0.00658850	0.72199174	0.00704634	1.00000000
15A	0.00082089	0.01838154	0.00616135	0.03974336	0.01090913	0.00670088	0.73406357	0.00716371	1.00000000
16A	0.00085171	0.01907194	0.00639271	0.04126559	0.01132404	0.00695754	0.76170731	0.00743264	1.00000000
17E	0.00089182	0.01997003	0.00669365	0.04325018	0.01186455	0.00729213	0.79767940	0.00778251	1.00000000
17F	0.00089372	0.02001251	0.00670788	0.04334270	0.01189898	0.00730773	0.79937767	0.00779906	1.00000000
18A	0.00221525	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192	0.57469530		1.00000000
19	0.00221522	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230	0.57469556		1.00000000
19C									1.00000000
20A	0.00237800	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666	0.61700971		1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045	0.64729087		1.00000000
21	0.00254199	0.05692053		0.12319480	0.03380324	0.02077093	0.65963498		1.00000000
22A		0.05773082		0.12495766	0.03428605	0.02106816	0.66905054		1.00000000
22B		0.05842136		0.12645207	0.03469614	0.02132008	0.67705256		1.00000000
23				0.14467451	0.03969010	0.02439237	0.77446614		1.00000000
24				0.22243002	0.04339444	0.02843498	0.66607404		1.00000000
25				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
26A				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
28G				0.05126137			0.94873863		1.00000000
28H							1.00000000		1.00000000
28J							1.00000000		1.00000000
29A							0.95147783	0.01307880	1.00000000
29F							0.95147785	0.01307876	1.00000000
29G							0.95147785	0.01307876	1.00000000
29H							0.96278381	0.00904475	1.00000000
29J							0.95147787	0.01307875	1.00000000
30							0.96212388	0.00860328	1.00000000
31A									1.00000000
33A									1.00000000
34									1.00000000
35									1.00000000

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors ^a

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
NORTH BAY AQUEDUCT								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29251728	0.70748272					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.42000793	0.57999207					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
SOUTH BAY AQUEDUCT								
1	Bethany Reservoir thru Altamont Turnout			0.33980110	0.19515838	0.46504052	0.00000000	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.33978741	0.19516252	0.46505007	0.00000000	1.00000000
4	Patterson Reservoir to del Valle Junction			0.31610985	0.20216089	0.48172926	0.00000000	1.00000000
5	Del Valle Junction thru Lake del Valle			0.53312173	0.12972254	0.33715573	0.00000000	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.32478705	0.19906896	0.47614399	0.00000000	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout			0.14604872	0.25176680	0.60218448	0.00000000	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir				0.00870534	0.02074442		N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
CALIFORNIA AQUEDUCT								
1	Delta thru Bethany Reservoir	0.00531733	0.00980983	0.03025189	0.02543471	0.03261424	0.00133231	0.01285731
2A	Bethany Reservoir to Orestimba Creek	0.00556981	0.01027565	0.03168561	0.02659794	0.03414482	0.00139496	0.01346134
2B	Orestimba Creek to O'Neill Forebay	0.00557591	0.01028692	0.03172214	0.02665525	0.03419372	0.00139688	0.01348022
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557485	0.01028496	0.03171662	0.02665847	0.03419057	0.00139675	0.01347886
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557373	0.01028290	0.03171083	0.02666184	0.03418727	0.00139660	0.01347742
5	Panoche Creek to Five Points	0.00557233	0.01028034	0.03170359	0.02666604	0.03418315	0.00139641	0.01347564
6	Five Points to Arroyo Pasajero	0.00557023	0.01027646	0.03169264	0.02667241	0.03417691	0.00139611	0.01347294
7	Arroyo Pasajero to Kettleman City	0.00556955	0.01027521	0.03168913	0.02667446	0.03417490	0.00139601	0.01347207
8C	Kettleman City thru Milham Avenue	0.00551372	0.01017222	0.03136760	0.02634395	0.03380670	0.00138114	0.01332783
8D	Milham Avenue thru Avenal Gap	0.00562589	0.01037913	0.03200712	0.02690327	0.03450392	0.00140955	0.01360237
9	Avenal Gap thru Twisselman Road			0.03413562	0.02766170	0.03515440	0.00151956	0.01434468
10A	Twisselman Road thru Lost Hills			0.03466441	0.02811523	0.03570083	0.00154355	0.01456988
11B	Lost Hills to 7th Standard Road			0.03795283	0.03090883	0.03909696	0.00169230	0.01596716
12D	7th Standard Road thru Elk Hills Road			0.03977601	0.03247016	0.04098077	0.00177500	0.01674332
12E	Elk Hills Road thru Tupman Road			0.03982615	0.03252493	0.04103348	0.00177748	0.01676607
13B	Tupman Road to Buena Vista Pumping Plant			0.04306127	0.03526355	0.04437384	0.00192363	0.01813953
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04511461	0.03683278	0.04649594	0.00201688	0.01901448
14B	Santiago Creek thru Old River Road			0.04575231	0.03310420	0.04715790	0.00204656	0.01929091
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04691141	0.03188663	0.04835804	0.00209976	0.01978843
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04759011	0.03234784	0.04906060	0.00213087	0.02007944
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.04915945	0.03341432	0.05068375	0.00220245	0.02075015
17E	Edmonston Pumping Plant to Porter Tunnel			0.05111116	0.03474064	0.05270294	0.00229159	0.02158519
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05121281	0.03480973	0.05280785	0.00229617	0.02162824
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13492411		0.11343564	0.00605029	0.05154511
19	Alamo Powerplant to Fairmont			0.13492060		0.11343396	0.00605043	0.05154576
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06855702		0.12212506	0.00651522	0.05550243
20B	70th Street West to Palmdale			0.02284441		0.12811683	0.00683511	0.05822670
21	Palmdale to Littlerock Creek			0.02327543		0.13055246	0.00696606	0.05933989
22A	Littlerock Creek to Pearlossom Pumping Plant			0.01190663		0.13241285	0.00706574	0.06018798
22B	Pearlossom Pumping Plant to West Fork Mojave River			0.00195128		0.13374659	0.00713697	0.06079440
23	West Fork Mojave River to Silverwood Lake					0.12416451	0.00818135	0.02168414
24	Cedar Springs Dam and Silverwood Lake					0.02651510	0.01251569	0.01910229
25	Silverwood Lake to South Portal San Bernardino Tunnel					0.09751351		0.01317145
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.					0.12013473		0.01622697
28G	Devil Canyon Powerplant to Barton Road					0.30672992		0.04143095
28H	Barton Road to Lake Perris					0.32330286		0.04366951
28J	Perris Dam and Lake Perris					0.32330202		0.04366970
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.			0.00296720	0.05726734			
29F	Oso Pumping Plant thru Quail Embankment			0.00296796	0.05726649			
29G	Quail Embankment thru Warne Powerplant				0.05742327			
29H	Pyramid Dam and Lake				0.03349572			
29J	Pyramid Lake thru Castaic Powerplant				0.05740996			
30	Castaic Dam and Lake				0.03248607			
31A	Avenal Gap to Devil's Den Pumping Plant	0.10542164	0.19449108		0.07351496	0.05400251		0.01800084
33A	Devil's Den Pumping Plant thru Tank 1	0.10101221	0.89898779					
33B	Tank 1 thru Chorro Valley Turnout	0.10101221	0.89898779					
34	Chorro Valley Turnout through Lopez Turnout	0.05271277	0.94728723					
35	Lopez Turnout thru Guadalupe Turnout		1.00000000					

(a) Proportionate use factors apply to 2013, and reflect permanent capacity water transfers that have been signed as of February 1, 2012

TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors ^a

Reach No.	SAN JOAQUIN VALLEY AREA										
	Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
							Municipal and Industrial	Agricultural			
CA-AQ											
1	0.00101484	0.00145898	0.02319949	0.01615131	0.00088464	0.00254083	0.02734671	0.27097810	0.00247151	0.00166718	0.02623179
2A	0.00106147	0.00152594	0.00868276	0.01687552	0.00092430	0.00266148	0.02862423	0.28311733	0.00258405	0.00174190	0.02740803
2B	0.00106363	0.00152909	0.00869847	0.01692102	0.00092679	0.00266440	0.02866891	0.28388802	0.00258995		0.02748193
3	0.00106373	0.00152923	0.00869862	0.01692574	0.00092704	0.00266388	0.02866737	0.28396935	0.00259035		0.02748959
4	0.00106381	0.00152938	0.00869878	0.01693069	0.00092732	0.00266334	0.02866575	0.28405484	0.00259078		0.02749765
5	0.00106393	0.00152955	0.00869900	0.01693689	0.00092766	0.00266267	0.02866371	0.28416159	0.00259131		0.02750772
6	0.00106411	0.00152984	0.00869933	0.01694627	0.00092817	0.00266166	0.02866064	0.28432311	0.00259212		0.02752293
7	0.00106417	0.00152994	0.00869944	0.01694928	0.00092834	0.00266132	0.02865965	0.28437492	0.00259238		0.02752781
8C	0.00105128	0.00151132	0.00859837	0.01671880	0.00091573	0.00263466	0.02834260	0.28049204	0.00255955		0.02715354
8D	0.00107350	0.00154329	0.00877841	0.01708138		0.00268825	0.02893019	0.28658089	0.00165702		0.00870332
9	0.00079266	0.00109382	0.00780913				0.03120712	0.29062507			
10A	0.00080563	0.00111151	0.00793478				0.03170601	0.27948051			
11B	0.00064541	0.00094507	0.00352004				0.03479195	0.21604857			
12D							0.03651059	0.18337144			
12E							0.03656518	0.18225937			
13B							0.01401068	0.14084192			
14A							0.00594265	0.10835951			
14B							0.00603229	0.09972183			
14C							0.00619161	0.07864417			
15A							0.00628468	0.06513906			
16A							0.00649824	0.03399327			
17E							0.00198956				
31A	0.00628695	0.00977801	0.02617705			0.05037550		0.36716813	0.00176551		

Reach No.	SOUTHERN CALIFORNIA AREA (continued)								Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	
CA-AQ									
1	0.00049039	0.02026940	0.00458417	0.02356132	0.00648505	0.00397256	0.41534642	0.00427793	1.00000000
2A	0.00051368	0.02120939	0.00480129	0.02466912	0.00679104	0.00415934	0.43503794	0.00448106	1.00000000
2B	0.00051424	0.02124686	0.00480693	0.02470313	0.00679973	0.00416506	0.43553483	0.00448597	1.00000000
3	0.00051415	0.02124700	0.00480611	0.02470048	0.00679880	0.00416461	0.43545774	0.00448513	1.00000000
4	0.00051405	0.02124715	0.00480527	0.02469768	0.00679782	0.00416415	0.43537672	0.00448423	1.00000000
5	0.00051394	0.02124733	0.00480420	0.02469419	0.00679659	0.00416357	0.43527553	0.00448312	1.00000000
6	0.00051373	0.02124760	0.00480260	0.02468892	0.00679474	0.00416268	0.43512243	0.00448142	1.00000000
7	0.00051367	0.02124768	0.00480210	0.02468723	0.00679414	0.00416240	0.43507332	0.00448088	1.00000000
8C	0.00050852	0.02100283	0.00475316	0.02442420	0.00672327	0.00411805	0.44214294	0.00443598	1.00000000
8D	0.00051886	0.02144190	0.00485015	0.02492681	0.00686107	0.00420278	0.45120471	0.00452622	1.00000000
9	0.00055881	0.01994731	0.00522500	0.02687208	0.00739401	0.00453075	0.48625347	0.00487481	1.00000000
10A	0.00056746	0.02025505	0.00530635	0.02729641	0.00750997	0.00460228	0.49387984	0.00495030	1.00000000
11B	0.00062129	0.02217012	0.00581177	0.02992657	0.00822957	0.00504572	0.54120601	0.00541983	1.00000000
12D	0.00065113	0.02323122	0.00600860	0.03138879	0.00862923	0.00529226	0.56749135	0.00568073	1.00000000
12E	0.00065195	0.02325982	0.00601618	0.03143281	0.00864089	0.00529967	0.56825874	0.00568728	1.00000000
13B	0.00070492	0.02514432	0.00650494	0.03401721	0.00934827	0.00573541	0.61478130	0.00614921	1.00000000
14A	0.00073852	0.02633904	0.00681518	0.03566616	0.00979876	0.00601341	0.64440971	0.00644237	1.00000000
14B	0.00074896	0.02670809	0.00691155	0.03619086	0.00994091	0.00610187	0.65375837	0.00653339	1.00000000
14C	0.00076794	0.02738097	0.00708669	0.03713140	0.01019693	0.00626044	0.67059673	0.00669885	1.00000000
15A	0.00077906	0.02777508	0.00718923	0.03768133	0.01034669	0.00635317	0.68044709	0.00679575	1.00000000
16A	0.00080474	0.02868734	0.00742633	0.03894698	0.01069195	0.00656658	0.70315463	0.00701982	1.00000000
17E	0.00083670	0.02982147	0.00772122	0.04052349	0.01112177	0.00683237	0.73142346	0.00729844	1.00000000
17F	0.00083837	0.02988073	0.00773658	0.04060443	0.01114395	0.00684601	0.73288217	0.00731296	1.00000000
18A	0.00220874	0.04945876	0.01657848	0.10699014	0.02936220	0.01803879	0.47140774		1.00000000
19	0.00220870	0.04945751	0.01657804	0.10699277	0.02936239	0.01803923	0.47141061		1.00000000
19C									1.00000000
20A	0.00237787	0.05324421	0.01784728	0.11521174	0.03161525	0.01942494	0.50757898		1.00000000
20B	0.00249455	0.05585607	0.01872278	0.12086783	0.03316690	0.02037859	0.53249023		1.00000000
21	0.00254183	0.05691567		0.12318381	0.03380017	0.02076901	0.54265567		1.00000000
22A		0.05772584		0.12494639	0.03428290	0.02106619	0.55040548		1.00000000
22B		0.05830722		0.12620561	0.03462835	0.02127845	0.55595113		1.00000000
23				0.14467451	0.03969010	0.02439237	0.63721302		1.00000000
24				0.22243002	0.04339445	0.02843498	0.64760747		1.00000000
25				0.11825184	0.03722720	0.01993915	0.71389685		1.00000000
26A				0.14947726	0.03997501	0.02520426	0.64898177		1.00000000
28G				0.05126136			0.60057777		1.00000000
28H							0.63302763		1.00000000
28J							0.63302828		1.00000000
29A							0.92702291	0.01274255	1.00000000
29F							0.92702302	0.01274253	1.00000000
29G							0.92979606	0.01278067	1.00000000
29H							0.95753173	0.00897255	1.00000000
29J							0.92980918	0.01278086	1.00000000
30							0.95895422	0.00855971	1.00000000
31A		0.09301782							1.00000000
33A									1.00000000
33B									1.00000000
34									1.00000000
35									1.00000000

(a) Proportionate use factors apply to 2013, and reflect permanent capacity water transfers that have been signed as of February 1, 2012

TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant ^a

(in dollars)

Sheet 1 of 3

Calendar Year	NORTH BAY AQUEDUCT			SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT			
	Reach 1	Reach 3A	Reach 3B	Reach 1 (c)	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping P.	Cordelia Pumping P. Solano	Cordelia Pumping P. Napa (b)	South Bay & Del Valle Pumping P.	Banks Pumping P.	Dos Amigos Pumping P.	Buena Vista Pumping P.	Teerink Pumping P.
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	36,771	0	0	0	0
1963	0	0	0	55,654	0	0	0	0
1964	0	0	0	73,240	0	0	0	0
1965	0	0	0	137,665	0	0	0	0
1966	0	0	0	186,064	0	0	0	0
1967	0	0	0	216,515	15,453	0	0	0
1968	0	0	6,989	336,671	452,630	202,947	0	0
1969	0	0	8,551	257,579	293,741	135,425	0	0
1970	0	0	13,598	396,358	346,215	211,197	1	0
1971	0	0	10,609	381,662	574,015	225,188	115,801	2,564
1972	0	0	14,434	598,702	933,292	492,633	198,914	68,304
1973	0	0	14,449	493,490	688,030	381,232	263,468	236,623
1974	0	0	17,473	565,575	783,562	447,772	315,939	324,966
1975	0	0	14,779	349,758	1,341,019	518,322	508,060	552,952
1976	0	0	20,856	571,361	1,638,453	641,115	712,947	713,875
1977	0	0	22,635	512,996	1,013,307	277,439	265,169	300,985
1978	0	0	21,692	586,355	2,339,502	560,759	689,236	616,104
1979	0	0	16,237	605,136	3,554,256	1,008,564	776,016	749,188
1980	0	0	19,945	523,369	2,083,336	1,129,152	1,051,629	1,047,495
1981	0	0	23,842	567,692	3,952,931	1,939,189	1,336,867	1,319,739
1982	0	0	12,157	605,780	3,082,031	1,363,705	1,200,226	1,213,660
1983	0	0	2,342	82,222	1,001,612	396,086	450,801	432,165
1984	0	0	4,822	271,543	1,856,959	976,773	823,681	770,618
1985	0	0	10,188	451,020	3,186,029	1,621,418	1,409,980	1,411,621
1986	0	0	15,501	807,984	6,601,752	2,627,407	2,405,224	2,432,322
1987	0	0	27,223	886,956	5,820,699	2,555,341	2,295,575	2,286,066
1988	17,813	0	24,020	909,300	6,365,689	2,648,986	2,628,985	2,636,224
1989	29,819	43,846	26,519	1,161,160	9,964,956	4,002,409	4,130,033	4,159,440
1990	52,210	67,109	40,775	1,834,626	10,554,762	4,541,508	5,855,196	6,099,412
1991	10,429	10,118	5,252	378,966	1,994,449	510,781	944,445	1,077,662
1992	13,319	13,070	9,406	311,251	3,385,375	1,235,571	1,366,433	1,441,966
1993	(11,941)	(8,753)	(5,392)	(158,214)	537,591	348,409	(127,617)	(104,923)
1994	46,791	39,624	29,189	799,624	6,013,464	2,450,174	2,778,971	2,823,137
1995	20,014	20,620	11,791	247,645	4,066,595	1,532,502	952,304	877,047
1996	57,320	47,288	23,483	619,160	8,385,766	4,056,188	2,565,655	2,378,677
1997	67,416	52,935	21,955	986,312	7,010,228	2,870,194	2,637,433	2,469,147
1998	(11,427)	(10,141)	(4,879)	(133,721)	204,374	(365,361)	(319,014)	(295,861)
1999	34,881	25,288	11,623	507,549	6,333,906	2,421,869	1,691,167	1,446,775
2000	53,377	37,126	13,643	648,915	7,331,775	2,773,987	2,655,902	2,803,463
2001	372,041	248,213	212,397	4,215,450	27,393,633	10,608,448	14,896,084	15,785,096
2002	192,540	104,564	61,470	2,036,126	17,666,689	7,284,182	8,870,415	9,554,380
2003	198,388	118,373	97,750	2,591,042	24,684,147	9,171,613	10,693,487	11,528,291
2004	261,564	138,880	106,974	2,414,624	22,854,796	9,426,446	12,567,612	13,722,260
2005	290,115	147,306	148,650	2,781,681	33,653,618	12,703,357	11,801,046	12,570,497
2006	232,145	111,129	144,025	2,478,580	23,329,946	10,084,621	11,090,650	11,864,779
2007	453,669	223,442	254,112	4,748,728	23,199,045	11,465,275	17,228,478	18,689,874
2008	408,002	183,644	294,333	3,270,337	14,049,403	6,284,489	11,055,574	12,751,502
2009	236,537	110,991	175,338	2,682,150	14,689,910	4,655,348	7,636,375	8,487,724
2010	279,678	110,820	237,054	2,621,011	28,360,841	10,276,199	11,181,641	11,772,474
2011	312,446	115,401	278,041	3,795,220	43,300,692	16,617,764	15,435,919	16,175,193
2012	943,010	1,049,281	615,270	5,526,541	31,742,896	13,287,119	15,736,653	18,207,488
2013	820,748	397,113	778,482	5,264,508	47,005,137	14,227,108	17,478,742	20,112,856
2014	999,896	567,535	604,090	5,858,580	43,720,307	15,690,393	19,393,094	22,342,614
2015	231,886	220,926	212,948	5,379,442	30,569,341	13,532,109	16,133,578	15,669,943
2016	330,980	245,364	212,948	5,379,442	30,189,405	14,040,613	17,015,479	16,578,820
2017	334,249	247,749	212,948	5,497,826	28,776,111	14,286,078	17,410,720	16,986,141
2018	424,079	247,749	434,524	5,497,826	31,095,557	15,194,364	18,792,269	18,409,972
2019	425,033	247,749	434,524	5,497,826	31,269,176	15,081,373	18,585,680	18,197,024
2020	425,033	247,749	434,524	5,497,826	31,328,487	15,411,490	19,158,990	18,787,864
2021	425,033	247,749	434,524	5,497,826	31,143,379	15,070,156	18,616,698	18,228,995
2022	425,033	247,749	434,524	5,497,826	31,958,929	15,370,844	19,154,721	18,783,505
2023	425,033	247,749	434,524	5,497,826	31,217,449	15,414,760	19,239,283	18,870,655
2024	425,033	247,749	434,524	5,497,826	31,449,925	15,141,638	18,769,880	18,386,901
2025	425,033	247,749	434,524	5,497,826	31,510,599	15,350,680	19,136,147	18,764,385
2026	425,033	247,749	434,524	5,497,826	30,249,034	14,807,843	18,200,067	17,799,648
2027	425,033	247,749	434,524	5,497,826	31,367,907	15,345,412	19,136,556	18,764,748
2028	425,033	247,749	434,524	5,497,826	31,635,715	15,557,270	19,513,949	19,153,722
2029	425,033	247,749	434,524	5,497,826	30,982,294	15,185,872	18,877,966	18,498,302
2030	425,033	247,749	434,524	5,497,826	31,326,853	15,150,176	18,816,884	18,435,358
2031	425,033	247,749	434,524	5,497,826	31,465,275	15,300,634	19,103,993	18,731,233
2032	425,033	247,749	434,524	5,497,826	31,830,498	15,247,363	19,019,069	18,643,719
2033	425,033	247,749	434,524	5,497,826	30,646,364	15,224,701	18,981,239	18,604,708
2034	425,033	247,749	434,524	5,497,826	30,688,827	14,688,449	18,067,775	17,663,315
2035	425,033	247,749	434,524	5,497,826	28,282,548	14,370,821	17,537,971	17,117,298
TOTAL	14,927,555	9,138,334	12,973,969	184,172,844	1,158,342,467	513,293,889	616,914,111	626,932,697

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

(b) Power costs for the period 1968 through 1987 are for an interim facility.

(c) The costs of Del Valle Pumping Plant are combined with those of South Bay Pumping Plant to simplify the cost allocations.

TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant ^a

(in dollars)

Sheet 2 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 2B (EBX)	Reach 3A (EBX)
	Chrisman Pumping P.	Edmonston Pumping P.	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Devil Canyon Powerplant	Greenspot Pumping Plant	Crafton Hills Pumping P.
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	142,902	542,625	0	3,468	0	(3,024)	0	0
1973	387,198	1,548,428	0	202,289	0	(461,268)	0	0
1974	564,464	2,164,223	0	324,993	0	(546,156)	0	0
1975	1,095,331	4,010,395	0	575,061	0	(1,095,523)	0	0
1976	1,506,985	5,443,936	0	889,544	0	(1,566,056)	0	0
1977	652,643	2,345,033	0	315,128	0	(1,222,866)	0	0
1978	1,132,296	4,180,131	0	1,508,115	0	(3,085,094)	0	0
1979	1,526,850	5,475,688	0	1,838,687	0	(3,466,481)	0	0
1980	2,102,439	7,028,235	0	1,762,063	0	(3,318,152)	0	0
1981	2,838,773	9,351,931	0	2,296,771	0	(3,842,971)	0	0
1982	2,424,920	8,352,207	0	1,498,620	0	(2,736,072)	0	0
1983	793,915	2,375,225	0	397,766	0	(5,478,830)	0	0
1984	1,479,784	4,585,198	0	624,213	0	(7,350,989)	0	0
1985	2,812,461	9,365,591	0	1,226,515	0	(10,748,103)	0	0
1986	4,999,949	16,956,023	(1,013,756)	2,359,599	0	(11,484,996)	0	0
1987	4,586,919	15,121,886	(1,064,827)	1,907,854	0	(11,151,140)	0	0
1988	5,284,130	17,342,811	(744,374)	2,375,784	0	(14,495,967)	0	0
1989	8,772,733	29,455,330	(789,392)	4,235,981	0	(18,688,631)	0	0
1990	13,814,150	49,027,449	(841,172)	6,559,548	0	(21,045,321)	0	0
1991	2,535,180	9,033,684	(269,625)	996,352	0	(4,884,013)	0	0
1992	2,907,026	9,754,469	(975,679)	1,225,121	0	(9,782,946)	0	0
1993	(598,008)	(2,721,158)	(58,116)	(260,035)	0	(7,502,549)	0	0
1994	5,941,789	20,657,617	(60,125)	2,644,592	0	(11,998,949)	0	0
1995	1,752,212	5,829,425	(1,324,810)	1,106,460	0	(9,742,248)	0	0
1996	5,050,986	17,658,964	(2,955,178)	2,833,791	(979,429)	(12,358,465)	0	0
1997	5,545,919	19,859,875	(2,572,220)	3,156,995	(1,748,195)	(13,830,356)	0	0
1998	(664,843)	(2,312,472)	(2,016,390)	(443,482)	(1,253,110)	(10,108,555)	0	0
1999	3,616,732	13,967,075	(2,980,122)	1,837,476	(2,587,958)	(15,232,207)	0	0
2000	6,322,905	22,737,294	(5,123,988)	3,327,055	(4,402,610)	(25,758,437)	0	0
2001	35,123,185	128,220,378	(3,383,762)	18,723,388	(3,714,425)	(20,062,834)	0	0
2002	21,173,346	77,461,814	(5,057,760)	10,849,297	(5,371,837)	(25,292,454)	0	0
2003	25,592,971	93,999,681	(3,408,979)	14,571,379	(6,565,620)	(27,777,638)	0	0
2004	30,458,046	111,866,623	(6,431,864)	16,978,585	(7,858,117)	(32,044,505)	78,351	68,735
2005	27,745,055	98,011,689	(5,880,165)	17,428,165	(6,454,740)	(28,818,797)	69,752	49,118
2006	25,942,349	87,589,603	(4,091,143)	16,221,571	(6,391,206)	(34,897,387)	139,546	152,891
2007	40,788,957	140,360,402	(3,029,048)	19,418,156	(5,896,486)	(28,814,592)	270,207	265,691
2008	24,860,890	86,124,732	(3,426,928)	11,319,783	(3,300,797)	(16,968,293)	272,321	348,145
2009	17,749,903	68,507,584	(3,266,008)	8,363,532	(2,288,833)	(13,842,660)	342,654	360,251
2010	26,042,019	95,161,863	(5,115,083)	16,754,501	(5,653,201)	(24,769,829)	329,029	433,690
2011	35,359,096	118,274,845	(6,536,645)	23,263,511	(7,792,422)	(32,285,174)	388,908	504,274
2012	38,625,947	132,944,847	(3,741,360)	25,821,001	(13,190,628)	(24,124,572)	478,775	597,209
2013	42,628,258	146,670,053	(7,133,188)	27,981,517	(12,381,604)	(23,456,444)	296,767	370,362
2014	47,397,726	163,319,740	(7,302,948)	31,438,279	(12,740,772)	(23,728,156)	356,960	445,483
2015	36,754,092	136,803,685	(7,576,944)	27,050,821	(9,874,192)	(23,385,600)	354,387	442,272
2016	38,934,071	145,061,964	(7,849,220)	27,898,207	(11,203,898)	(24,638,025)	378,909	472,875
2017	39,911,070	148,762,914	(7,966,266)	27,883,174	(10,358,751)	(24,068,025)	359,924	449,182
2018	43,326,182	161,700,050	(8,167,076)	28,851,908	(10,513,979)	(24,184,925)	359,924	449,182
2019	42,815,453	159,765,399	(7,948,894)	27,742,708	(10,498,879)	(24,182,425)	359,924	449,182
2020	44,232,652	165,133,919	(8,092,428)	28,443,133	(10,773,397)	(24,096,425)	359,924	449,182
2021	42,892,158	160,056,006	(8,011,244)	28,214,972	(10,850,558)	(23,983,025)	359,924	449,182
2022	44,222,116	165,094,136	(8,003,590)	28,048,029	(10,940,101)	(24,221,750)	359,924	449,182
2023	44,431,158	165,885,934	(8,236,392)	29,178,391	(10,684,609)	(24,130,400)	359,924	449,182
2024	43,270,868	161,490,599	(7,990,862)	28,057,838	(10,394,387)	(24,468,475)	359,924	449,182
2025	44,176,248	164,920,380	(8,130,096)	28,624,064	(10,541,159)	(24,330,775)	359,924	449,182
2026	41,862,297	156,154,687	(7,945,368)	27,912,694	(10,621,793)	(23,882,900)	359,924	449,182
2027	44,177,201	164,923,923	(8,031,798)	28,078,184	(10,803,446)	(24,228,750)	359,924	449,182
2028	45,110,057	168,457,794	(8,206,292)	29,000,867	(11,279,247)	(24,443,250)	359,924	449,182
2029	43,537,995	162,502,521	(8,040,570)	28,264,019	(10,391,065)	(24,118,350)	359,924	449,182
2030	43,387,037	161,930,664	(7,931,264)	27,860,649	(10,459,770)	(23,743,075)	359,924	449,182
2031	44,096,773	164,619,238	(8,135,858)	28,688,416	(10,879,399)	(24,390,225)	359,924	449,182
2032	43,886,777	163,823,851	(7,974,780)	27,767,777	(10,346,822)	(24,030,025)	359,924	449,182
2033	43,793,269	163,469,529	(8,146,952)	28,658,215	(10,780,494)	(24,269,300)	359,924	449,182
2034	41,535,313	154,916,011	(8,106,016)	28,651,131	(10,565,470)	(24,121,000)	359,924	449,182
2035	40,225,610	149,954,541	(7,677,048)	26,689,867	(10,499,332)	(23,140,925)	359,924	449,182
TOTAL	1,425,394,885	5,203,078,717	(258,763,613)	898,024,053	(333,832,738)	(1,105,927,350)	10,595,126	13,045,456

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant ^a

(in dollars)

Sheet 3 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 4B (EBX) Cherry Valley Pumping P.	Reach 29A Oso Pumping Plant	Reach 29G Warne Powerplant	Reach 29J Castaic Powerplant	Reach 31A Las Perillas and Badger Hill Pumping Plants	Reach 33A Devil's Den, Bluestone and Polonio Pass Pumping Plants	
	[17]	[18]	[19]	[20]	[21]	[22]	
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	36,771
1963	0	0	0	0	0	0	55,654
1964	0	0	0	0	0	0	73,240
1965	0	0	0	0	0	0	137,665
1966	0	0	0	0	0	0	186,064
1967	0	0	0	0	0	0	231,968
1968	0	0	0	0	118,676	0	1,117,913
1969	0	0	0	0	78,350	0	773,646
1970	0	0	0	0	136,429	0	1,103,798
1971	0	0	0	0	166,296	0	1,476,135
1972	0	79,315	0	(211,144)	212,938	0	3,073,359
1973	0	122,787	0	(1,057,564)	114,897	0	2,934,059
1974	0	157,511	0	(1,547,884)	111,442	0	3,683,880
1975	0	314,636	0	(2,455,461)	88,451	0	5,817,780
1976	0	326,967	0	(2,827,557)	139,279	0	8,211,705
1977	0	75,335	0	(3,734,462)	63,079	0	886,421
1978	0	89,383	0	(1,542,479)	176,153	0	7,272,153
1979	0	102,584	0	(2,776,030)	188,881	0	9,599,576
1980	0	236,768	0	(3,415,486)	168,458	0	10,419,251
1981	0	444,280	0	(2,834,322)	169,177	0	17,563,899
1982	0	539,245	(783,626)	(3,463,971)	168,390	0	13,477,272
1983	0	214,069	(1,488,439)	(6,649,718)	17,920	0	(7,452,864)
1984	0	484,239	(4,088,209)	(4,710,802)	112,679	0	(4,159,491)
1985	0	874,069	(5,930,176)	(15,698,638)	146,843	0	(9,861,182)
1986	0	1,269,590	(5,579,301)	(11,072,448)	297,886	0	11,622,736
1987	0	1,355,533	(6,445,265)	(11,726,458)	245,082	0	6,701,444
1988	0	1,515,349	(7,457,050)	(13,026,992)	214,519	0	6,239,207
1989	0	2,156,915	(8,822,367)	(15,535,849)	282,180	0	24,585,082
1990	0	2,913,030	(11,225,401)	(20,510,539)	416,832	0	48,154,174
1991	0	576,721	(3,882,595)	(6,579,194)	3,610	0	2,462,222
1992	0	829,862	(6,369,339)	(10,976,538)	101,665	0	(5,509,968)
1993	0	70,836	(4,665,393)	(9,531,404)	(111,306)	0	(24,907,973)
1994	0	1,503,796	(7,249,239)	(13,126,331)	206,086	(1,127)	13,499,083
1995	0	247,869	(1,934,202)	(4,049,615)	243,434	0	(142,957)
1996	0	895,929	(4,248,531)	(8,457,232)	296,170	0	15,870,542
1997	0	902,690	(4,824,488)	(8,776,260)	298,483	208,816	14,336,879
1998	0	(67,399)	(1,811,154)	(4,644,120)	(55,491)	(92,902)	(24,405,948)
1999	0	731,865	(5,831,573)	(9,811,777)	166,036	234,077	(3,417,318)
2000	0	1,148,391	(10,161,472)	(17,729,381)	200,736	332,070	(12,789,249)
2001	0	6,431,037	(7,918,467)	(13,370,061)	1,064,759	2,146,216	216,990,776
2002	0	4,246,409	(11,349,183)	(19,513,997)	547,531	1,344,783	94,808,315
2003	0	4,641,548	(10,436,535)	(17,134,431)	637,860	1,538,771	134,742,098
2004	7,271	5,667,657	(12,281,228)	(21,354,179)	673,974	1,799,785	149,122,290
2005	2,575	3,705,635	(7,106,531)	(13,339,416)	855,239	1,743,858	162,107,707
2006	18,776	2,835,832	(7,208,025)	(12,042,760)	836,131	1,490,434	129,932,487
2007	14,450	7,676,769	(11,444,524)	(21,845,299)	1,319,961	2,311,565	217,658,832
2008	10,887	4,999,322	(7,762,363)	(14,997,326)	1,106,545	1,648,081	132,532,283
2009	9,523	4,200,464	(6,997,502)	(16,308,270)	761,480	1,089,347	97,355,838
2010	22,413	3,803,520	(6,643,531)	(11,641,405)	980,226	1,654,673	156,198,603
2011	36,108	3,558,425	(5,996,974)	(10,892,193)	1,295,217	2,707,779	217,915,431
2012	116,495	5,234,553	(6,508,232)	(10,590,000)	1,515,267	5,340,624	239,628,184
2013	0	5,928,745	(6,547,472)	(10,562,500)	1,412,558	3,424,533	274,716,279
2014	91,801	6,490,212	(6,583,032)	(10,565,000)	1,526,850	3,715,335	303,038,987
2015	0	4,727,133	(6,191,675)	(9,059,850)	1,361,885	3,042,987	236,399,173
2016	0	5,343,360	(6,993,600)	(10,430,250)	1,361,885	3,042,987	245,372,316
2017	0	5,751,544	(7,448,425)	(11,254,575)	1,361,885	3,042,987	250,178,460
2018	0	6,811,968	(8,684,250)	(13,381,225)	1,488,001	3,893,280	272,045,380
2019	0	7,000,801	(8,870,725)	(13,766,125)	1,488,001	3,893,280	267,986,085
2020	0	7,363,162	(9,378,750)	(14,486,225)	1,488,001	3,893,280	275,827,991
2021	0	6,858,473	(8,742,500)	(13,476,400)	1,488,001	3,893,280	268,812,629
2022	0	7,505,854	(9,506,225)	(14,776,525)	1,488,001	3,893,280	275,485,462
2023	0	7,176,418	(9,126,800)	(14,110,200)	1,488,001	3,893,280	277,921,166
2024	0	7,083,682	(8,985,725)	(13,930,600)	1,488,001	3,893,280	270,676,801
2025	0	7,270,926	(9,258,300)	(14,295,150)	1,488,001	3,893,280	275,993,468
2026	0	6,518,092	(8,298,425)	(12,796,625)	1,488,001	3,893,280	262,754,770
2027	0	7,474,836	(9,475,250)	(14,711,450)	1,488,001	3,893,280	274,813,592
2028	0	7,541,277	(9,594,675)	(14,843,000)	1,488,001	3,893,280	280,399,706
2029	0	7,124,328	(9,086,225)	(14,006,500)	1,488,001	3,893,280	272,126,106
2030	0	7,208,299	(9,187,075)	(14,176,550)	1,488,001	3,893,280	271,413,705
2031	0	7,211,932	(9,241,100)	(14,179,675)	1,488,001	3,893,280	275,186,756
2032	0	7,462,801	(9,469,600)	(14,683,700)	1,488,001	3,893,280	273,972,447
2033	0	7,089,677	(9,014,300)	(13,940,650)	1,488,001	3,893,280	273,111,525
2034	0	6,098,963	(7,849,050)	(11,951,300)	1,488,001	3,893,280	262,512,467
2035	0	6,253,917	(7,987,575)	(12,265,025)	1,488,001	3,893,280	251,658,187
TOTAL	330,299	232,409,736	(399,971,669)	(703,158,093)	50,587,531	111,844,719	8,280,352,924

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

Tables B-4 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-4 Maximum Contractual Table A Amounts

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	507	5,248	5,783	11,538	0	0	0
1968	0	0	0	6,900	15,000	88,000	109,900	0	0	0
1969	0	0	0	8,200	15,500	75,000	98,700	0	0	0
1970	0	0	0	10,000	16,200	88,000	114,200	0	0	0
1971	0	0	0	11,200	17,000	88,000	116,200	0	0	0
1972	0	0	0	12,400	17,900	88,000	118,300	0	0	0
1973	0	0	0	13,600	18,800	88,000	120,400	0	0	0
1974	0	0	0	14,800	19,600	88,000	122,400	0	0	0
1975	0	0	0	16,000	20,500	88,000	124,500	0	0	0
1976	0	0	0	17,200	21,300	88,000	126,500	0	0	0
1977	0	0	0	18,400	22,200	88,000	128,600	0	0	0
1978	0	0	0	19,600	23,100	88,000	130,700	0	0	0
1979	0	0	0	20,800	23,900	88,000	132,700	0	0	0
1980	0	500	500	22,000	24,800	88,000	134,800	1,000	946	1,946
1981	0	650	650	23,000	26,000	88,000	137,000	1,000	1,813	2,813
1982	0	800	800	24,000	27,200	88,000	139,200	2,000	3,626	5,626
1983	0	950	950	25,000	28,400	88,000	141,400	3,000	5,439	8,439
1984	0	1,100	1,100	26,000	29,600	88,000	143,600	4,500	8,198	12,698
1985	0	1,250	1,250	27,000	30,800	88,000	145,800	7,500	13,638	21,138
1986	0	1,400	1,400	28,000	32,100	88,000	148,100	10,000	18,210	28,210
1987	0	1,550	1,550	29,000	33,300	88,000	150,300	12,500	22,704	35,204
1988	5,745	9,726	15,471	30,000	34,500	88,000	152,500	15,500	28,222	43,722
1989	6,195	18,420	24,615	31,000	35,700	90,000	156,700	20,000	36,342	56,342
1990	6,940	21,250	28,190	32,000	36,900	92,000	160,900	25,000	45,486	70,486
1991	7,290	22,300	29,590	34,000	38,400	94,000	166,400	25,000	45,486	70,486
1992	7,840	24,170	32,010	36,000	39,900	96,000	171,900	25,000	45,486	70,486
1993	8,490	26,130	34,620	38,000	41,400	98,000	177,400	25,000	45,486	70,486
1994	9,135	28,080	37,215	40,000	42,000	100,000	182,000	25,000	45,486	70,486
1995	9,780	34,250	44,030	42,000	42,000	100,000	184,000	25,000	45,486	70,486
1996	10,425	37,800	48,225	44,000	42,000	100,000	186,000	25,000	45,486	70,486
1997	11,065	38,250	49,315	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1999	15,850	39,170	55,020	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2000	16,325	39,620	55,945	68,000	42,000	100,000	210,000	25,000	45,486	70,486
2001	20,725	45,836	66,561	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2002	21,100	46,296	67,396	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2003	21,475	46,756	68,231	78,400	42,000	100,000	220,400	25,000	45,486	70,486
2004	21,850	47,206	69,056	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2005	22,225	47,256	69,481	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2006	22,550	47,306	69,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2007	22,875	47,356	70,231	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2008	23,200	47,406	70,606	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2009	23,525	47,456	70,981	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2010	23,900	47,506	71,406	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2011	29,025	47,556	76,581	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2012	29,025	47,606	76,631	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2013	29,025	47,656	76,681	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2014	29,025	47,706	76,731	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2015	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2016	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2017	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2018	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2019	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2020	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2021	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2022	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2023	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2024	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2025	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2026	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2027	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2028	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2029	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2030	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2031	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2032	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2033	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2034	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2035	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
TOTAL	1,080,965	2,049,856	3,130,821	3,720,815	2,459,248	6,510,783	12,690,846	1,189,430	2,218,494	3,407,924

(a) Table A Amounts for the South Bay area were supplied by non-Project water for the period June 1962 through November 1967. Actual delivery quantities of Project water are shown for 1967.
 (b) District's Table A quantities exclude amounts during the period 1968 through 1987 that were supplied by non-Project water.

TABLE B-4 Maximum Contractual Table A Amounts

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	14,300	1,000	0	46,600	46,600	900	2,300	12,250	77,350
1969	14,325	3,000	0	95,700	95,700	1,200	2,500	46,350	163,075
1970	15,700	3,000	28,700	116,400	145,100	1,300	2,600	34,300	202,000
1971	17,900	3,000	35,700	154,600	190,300	1,300	2,800	36,500	251,800
1972	20,000	3,000	39,200	231,500	270,700	1,400	5,366	112,600	413,066
1973	22,000	3,000	43,500	267,000	310,500	1,500	3,100	43,552	383,652
1974	33,390	3,000	48,000	299,000	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	52,700	358,120	410,820	1,600	3,576	86,258	545,809
1976	30,921	3,000	56,100	386,050	442,150	1,600	4,039	61,707	543,417
1977	30,400	3,000	60,600	423,000	483,600	1,700	3,700	59,000	581,400
1978	32,500	0	64,100	470,200	534,300	1,900	3,900	63,300	635,900
1979	38,544	3,000	67,600	516,300	583,900	2,000	4,000	71,241	702,685
1980	41,000	3,000	71,100	563,400	634,500	2,200	5,700	71,700	758,100
1981	41,000	3,000	74,800	616,600	691,400	2,300	4,300	76,000	818,000
1982	41,000	3,000	79,600	665,700	745,300	2,500	4,500	80,200	876,500
1983	42,900	3,000	83,500	721,600	805,100	2,800	3,770	9,548	867,118
1984	45,100	3,000	103,600	757,000	860,600	3,100	4,800	62,611	979,211
1985	47,200	3,000	108,900	806,100	915,000	3,400	4,900	45,549	1,019,049
1986	49,300	3,000	113,400	820,246	933,646	3,700	5,100	97,200	1,091,946
1987	51,400	3,000	119,100	904,400	1,023,500	4,000	5,200	101,400	1,188,500
1988	53,500	3,000	123,900	950,700	1,074,600	4,000	5,400	105,600	1,246,100
1989	55,600	3,000	128,200	984,100	1,112,300	4,000	5,600	109,900	1,290,400
1990	28,850	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,313,450
1991	53,411	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,338,011
1992	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1993	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1994	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1995	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1996	53,370	3,000	134,600	982,460	1,117,060	4,000	5,700	118,500	1,301,630
1997	53,370	3,000	134,600	978,130	1,112,730	4,000	5,700	118,500	1,297,300
1998	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
1999	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
2000	53,370	3,000	134,600	886,130	1,020,730	4,000	5,700	118,500	1,205,300
2001	53,370	3,000	134,600	866,349	1,000,949	4,000	5,700	118,500	1,185,519
2002	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,527	1,182,519
2003	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,127	1,182,119
2004	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2005	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2006	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2007	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2008	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2009	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2010	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2011	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2012	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2013	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2014	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2015	47,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,137,000
2016	47,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,137,000
2017	47,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,137,000
2018	47,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,137,000
2019	47,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,137,000
2020	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2021	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2022	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2023	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2024	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2025	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2026	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2027	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2028	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2029	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2030	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2031	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2032	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2033	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2034	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
2035	43,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,133,000
TOTAL	3,052,478	199,000	7,693,900	51,855,303	59,549,203	403,050	352,822	5,991,823	69,548,376

TABLE B-4 Maximum Contractual Table A Amounts

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	3,700	0	0	0	0	0	0	0	0
1969	0	5,000	0	0	0	0	0	0	0	0
1970	0	5,700	0	0	0	0	0	0	0	0
1971	0	6,700	0	0	0	0	0	0	0	0
1972	20,000	8,936	5,200	526	8,000	170	8,400	1,620	1,677	122
1973	25,000	12,400	5,800	870	9,000	290	10,700	2,940	48,000	11,500
1974	30,000	15,400	6,400	1,160	10,000	400	13,100	4,260	50,000	12,300
1975	35,000	18,200	7,000	1,450	11,000	520	15,400	5,580	52,500	13,100
1976	44,000	21,200	7,600	1,740	12,000	640	17,800	6,900	55,000	14,000
1977	50,000	24,100	8,421	2,030	13,000	730	20,200	8,220	57,500	14,800
1978	57,000	24,762	9,242	2,320	14,000	920	22,000	9,340	60,000	15,700
1979	63,000	28,000	10,063	2,610	15,000	1,040	24,900	10,260	62,500	16,600
1980	69,200	30,400	10,884	2,900	17,000	1,150	27,200	11,180	65,500	17,400
1981	75,000	32,800	12,105	3,190	19,000	1,270	23,100	11,700	68,500	18,300
1982	81,300	34,800	13,326	3,480	21,000	1,380	22,843	12,320	71,500	19,100
1983	87,700	37,300	14,547	3,770	23,000	1,500	34,300	12,940	74,500	19,900
1984	35,000	39,600	15,768	4,060	25,000	1,610	36,700	13,560	78,000	20,700
1985	40,000	41,800	16,989	4,350	27,000	1,730	39,000	14,180	81,500	21,800
1986	42,000	43,600	18,210	4,640	29,000	1,840	41,400	14,800	85,000	23,200
1987	44,000	45,600	19,431	4,930	31,500	1,960	43,700	15,420	89,000	24,600
1988	46,000	48,000	20,652	5,220	34,000	2,070	46,000	16,040	93,000	26,000
1989	125,700	50,100	21,873	5,510	36,500	2,190	48,500	16,660	97,000	27,400
1990	132,100	52,000	23,100	5,800	38,100	2,300	50,800	17,300	101,500	28,800
1991	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1992	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1993	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1994	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1995	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1996	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1997	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1998	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
1999	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
2000	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2001	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2002	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2003	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2004	141,400	95,200	33,000	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2005	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2006	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2007	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2008	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2009	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2010	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2011	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2012	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2013	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2014	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2015	141,400	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2016	141,400	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2017	141,400	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2018	141,400	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2019	141,400	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2020	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2021	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2022	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2023	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2024	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2025	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2026	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2027	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2028	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2029	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2030	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2031	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2032	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2033	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2034	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2035	141,400	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
TOTAL	7,432,000	4,545,098	4,782,511	321,556	2,626,000	127,210	4,069,043	1,127,720	5,909,177	1,641,322

TABLE B-4 Maximum Contractual Table A Amounts

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	11,538
1968	0	0	0	3,700	0	300	250	550	0	191,500
1969	0	0	0	5,000	0	350	270	620	0	267,395
1970	0	0	0	5,700	0	400	300	700	0	322,600
1971	0	0	0	6,700	0	450	440	890	0	375,590
1972	0	154,772	0	209,423	0	500	470	970	0	741,759
1973	0	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	0	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	0	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	0	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	0	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	0	856,300	0	1,049,584	0	1,200	650	1,850	0	1,819,034
1979	0	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	6,800	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	7,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	8,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	9,800	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,164
1984	10,800	1,458,300	5,000	1,744,098	1,600	1,200	830	3,630	0	2,884,337
1985	11,800	1,558,700	6,000	1,864,849	1,700	1,200	860	3,760	0	3,055,846
1986	12,900	1,659,300	8,000	1,983,890	2,100	1,200	890	4,190	0	3,257,736
1987	14,000	1,759,800	10,000	2,103,941	2,500	1,200	920	4,620	0	3,484,115
1988	15,100	1,860,400	13,000	2,225,482	2,900	1,200	960	5,060	0	3,688,335
1989	16,200	1,961,000	16,000	2,424,633	3,300	1,200	1,000	5,500	0	3,958,190
1990	17,300	2,011,500	20,000	2,500,600	3,800	1,200	1,040	6,040	0	4,079,666
1991	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,126,567
1992	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,120	11,920	0	4,138,816
1993	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,160	11,960	0	4,146,966
1994	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,200	12,000	0	4,154,201
1995	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,250	12,050	0	4,163,066
1996	0	2,011,500	20,000	2,492,900	9,600	1,200	1,300	12,100	0	4,111,341
1997	0	2,011,500	20,000	2,492,900	9,600	1,200	1,350	12,150	0	4,084,866
1998	0	2,011,500	20,000	2,517,900	9,600	1,200	1,400	12,200	0	4,085,021
1999	2,000	2,011,500	20,000	2,519,900	9,600	2,890	1,450	13,940	0	4,119,646
2000	3,000	2,011,500	20,000	2,565,900	9,600	2,890	1,510	14,000	0	4,121,631
2001	4,000	2,011,500	20,000	2,566,900	9,600	3,500	1,570	14,670	0	4,124,136
2002	4,000	2,011,500	20,000	2,569,900	9,600	3,500	1,630	14,730	0	4,125,031
2003	5,000	2,011,500	20,000	2,570,900	9,600	3,500	1,690	14,790	0	4,126,926
2004	6,000	2,011,500	20,000	2,581,800	9,600	3,500	0	13,100	0	4,127,061
2005	6,500	1,911,500	20,000	2,582,300	9,600	1,200	0	10,800	0	4,125,686
2006	7,000	1,911,500	20,000	2,582,800	9,600	1,200	324	11,124	0	4,126,885
2007	8,650	1,911,500	20,000	2,584,450	9,600	1,200	720	11,520	0	4,129,306
2008	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,020	39,120	0	4,165,931
2009	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,090	39,190	0	4,166,376
2010	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,160	39,260	0	4,171,996
2011	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,240	39,340	0	4,172,126
2012	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,320	39,420	0	4,172,256
2013	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,410	39,510	0	4,172,396
2014	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,500	39,600	0	4,172,536
2015	17,300	1,911,500	20,000	2,626,100	9,600	27,500	2,600	39,700	0	4,172,686
2016	17,300	1,911,500	20,000	2,626,100	9,600	27,500	2,700	39,800	0	4,172,786
2017	17,300	1,911,500	20,000	2,626,100	9,600	27,500	2,700	39,800	0	4,172,786
2018	17,300	1,911,500	20,000	2,626,100	9,600	27,500	2,700	39,800	0	4,172,786
2019	17,300	1,911,500	20,000	2,626,100	9,600	27,500	2,700	39,800	0	4,172,786
2020	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2021	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2022	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2023	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2024	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2025	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2026	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2027	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2028	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2029	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2030	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2031	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2032	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2033	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2034	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
2035	17,300	1,911,500	20,000	2,630,100	9,600	27,500	2,700	39,800	0	4,172,786
TOTAL	748,350	109,260,272	988,000	143,578,259	449,900	826,280	106,474	1,382,654	0	233,738,880

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 1 of 17

Calendar Year	VUFR BUTTE	VUFR BUTTE YUBA	Grizzly Valley Pipeline PC FC&WCD	VUFR YUBA	NORTH BAY AQUEDUCT								Total
					Reach 1	Reach 3A NC	Reach 3A SCWA	Reach 3A-T NC	Reach 3A-T SCWA	Reach 3B NC (a)	Reach 3B SCWA		
					SCWA	FC&WCD	SCWA	FC&WCD	SCWA	FC&WCD	SCWA		
					[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	1,214	0	0	1,214
1969	0	0	70	0	0	0	0	0	0	2,687	0	0	2,687
1970	0	0	70	0	0	0	0	0	0	3,618	0	0	3,618
1971	192	0	64	0	0	0	0	0	0	2,521	0	0	2,521
1972	186	0	505	0	0	0	0	0	0	3,647	0	0	3,647
1973	53	0	679	0	0	0	0	0	0	3,792	0	0	3,792
1974	127	0	648	0	0	0	0	0	0	4,870	0	0	4,870
1975	253	0	405	0	0	0	0	0	0	6,840	0	0	6,840
1976	527	0	382	0	0	0	0	0	0	7,122	0	0	7,122
1977	706	0	303	0	0	0	0	0	0	8,226	0	0	8,226
1978	579	0	278	0	0	0	0	0	0	6,034	0	0	6,034
1979	302	0	329	0	0	0	0	0	0	6,561	0	0	6,561
1980	267	0	295	0	0	0	0	0	0	6,707	0	0	6,707
1981	221	0	355	0	0	0	0	0	0	9,001	0	0	9,001
1982	334	0	305	0	0	0	0	0	0	1,213	0	0	1,213
1983	325	0	262	0	0	0	0	0	0	2,287	0	0	2,287
1984	177	0	272	108	0	0	0	0	0	2,923	0	0	2,923
1985	308	0	254	62	0	0	0	0	0	4,039	0	0	4,039
1986	313	0	317	328	1,400	0	0	0	0	3,519	0	0	4,919
1987	459	0	452	88	1,550	0	0	0	0	7,693	0	0	9,243
1988	385	0	523	303	1	0	9,725	0	0	5,392	0	0	15,118
1989	300	0	486	403	10	0	17,246	0	0	6,195	0	0	23,451
1990	380	0	548	494	3,275	0	15,856	0	0	6,940	0	0	26,071
1991	328	0	420	265	3,117	0	3,855	0	0	1,380	0	0	8,352
1992	117	0	485	642	5,553	0	9,220	0	0	4,001	0	0	18,774
1993	256	0	444	746	14,709	0	14,471	0	0	5,286	0	0	34,466
1994	329	0	492	1,035	10,343	0	14,913	0	0	6,792	0	0	32,048
1995	203	0	308	910	5,452	0	15,893	0	0	5,182	0	0	26,527
1996	257	0	360	820	12,930	0	17,069	0	0	4,893	0	0	34,892
1997	185	0	231	1,005	16,029	0	17,501	0	0	4,341	0	0	37,871
1998	527	0	0	1,054	11,562	0	18,204	0	0	5,359	0	0	35,125
1999	286	0	0	1,096	15,191	0	19,562	0	0	5,304	0	0	40,057
2000	586	0	0	901	15,490	0	11,290	0	10,235	4,958	0	0	41,973
2001	513	0	0	1,065	14,849	0	11,377	0	8,360	9,345	0	0	43,931
2002	419	0	0	1,181	18,841	0	11,130	0	8,589	6,875	0	0	45,435
2003	551	0	0	1,324	17,260	0	9,682	9	7,009	6,637	0	0	41,597
2004	1,440	0	0	1,434	20,951	0	10,691	135	10,860	7,999	500	0	51,136
2005	0	527	0	527	18,290	0	10,585	160	8,444	7,509	500	0	45,488
2006	468	0	0	5,342	16,573	0	10,865	208	7,578	7,581	500	0	43,305
2007	956	0	0	2,327	19,187	0	12,301	180	15,312	10,777	500	0	58,257
2008	451	0	243	1,923	21,436	15	11,410	37	7,974	13,240	500	0	54,612
2009	581	0	200	2,114	15,004	0	8,651	27	6,795	10,877	500	0	41,854
2010	807	0	243	2,331	17,598	0	8,231	70	4,487	12,347	500	0	43,233
2011	1,092	0	98	2,297	15,202	0	7,761	39	5,032	11,275	0	0	39,309
2012	1,600	0	1,392	8,232	13,380	0	32,678	125	2,251	18,921	0	0	67,355
2013	1,602	0	1,447	5,760	17,961	0	10,603	0	0	17,415	0	0	45,979
2014	1,602	0	1,500	5,760	18,961	0	10,603	0	0	17,415	0	0	46,979
2015	1,602	0	1,562	5,760	18,354	0	11,210	0	0	17,415	0	0	46,979
2016	1,642	0	1,619	5,760	16,114	0	12,450	0	0	17,415	0	0	45,979
2017	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2018	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2019	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2020	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2021	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2022	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2023	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2024	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2025	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2026	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2027	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2028	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2029	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2030	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2031	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2032	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2033	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2034	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
2035	1,706	0	1,619	5,760	15,993	0	12,571	0	0	17,415	0	0	45,979
TOTAL	57,208	527	49,537	172,837	700,440	15	613,882	990	102,926	685,465	3,500	0	2,107,218

(a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 2 of 17

Calendar Year	SOUTH BAY AQUEDUCT (b)										
	Reach 1		Reach 2	Reach 4	Reach 5		Reach 6	Reach 7	Reach 8	Reach 9	Total
	AC		AC	AC	AC		AC				
	FC&WCD	ACWD	FC&WCD	FC&WCD	FC&WCD	ACWD	FC&WCD	ACWD	ACWD	SCVWD	
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	
1962	141	8,412	353	0	0	0	0	0	0	0	8,906
1963	814	10,914	917	0	0	0	0	0	0	0	12,645
1964	248	19,238	1,425	0	0	0	0	0	0	0	20,911
1965	637	15,280	1,830	138	0	0	0	1,127	0	15,014	34,026
1966	2,475	0	2,537	499	0	0	0	14,864	0	34,538	54,913
1967	1,527	0	2,391	862	0	0	0	12,882	0	39,101	56,763
1968	1,608	0	3,799	721	5	0	0	24,817	0	70,105	101,055
1969	1,165	0	3,459	1,851	160	0	0	813	0	62,264	69,712
1970	1,345	0	4,558	3,182	164	0	0	0	0	80,311	89,560
1971	546	0	1,908	2,403	160	0	0	5,961	0	87,606	98,584
1972	1,066	0	4,605	2,041	2,777	1,489	0	26,182	0	100,266	138,426
1973	430	0	1,123	1,193	229	0	0	2,521	0	88,582	94,078
1974	177	0	0	975	162	0	0	0	4	88,000	89,318
1975	137	0	1,783	1,864	120	0	714	393	593	88,000	93,604
1976	265	0	7,204	3,384	817	0	5,461	13,774	7,526	88,000	126,431
1977	210	0	4,491	2,213	524	0	5,206	11,284	7,556	76,220	107,704
1978	422	0	2,426	3,754	2,034	0	2,348	854	5,009	95,727	112,574
1979	197	0	4,283	5,567	3,937	0	5,341	3,430	7,444	91,981	122,190
1980	77	0	3,883	6,686	0	1,508	6,144	2,824	6,702	88,000	115,824
1981	1,250	0	4,648	5,273	1,157	5,752	7,262	7,595	8,570	88,000	129,507
1982	473	0	3,043	4,406	630	0	4,571	1,776	4,540	88,000	107,439
1983	179	0	2,712	1,714	50	0	111	0	3,157	86,733	94,656
1984	165	0	4,219	2,219	55	0	126	0	3,338	88,000	96,122
1985	213	0	5,199	2,060	63	0	7,537	11,203	7,813	88,000	122,088
1986	200	0	6,052	2,062	212	0	2,083	5,311	7,068	88,000	110,988
1987	218	0	7,538	2,372	285	0	12,993	15,488	9,902	88,000	136,796
1988	222	0	8,302	4,681	189	0	12,436	24,259	9,205	87,961	147,255
1989	222	0	8,051	6,562	418	0	10,974	17,340	8,702	90,000	142,269
1990	256	0	8,160	8,347	593	0	15,678	22,149	9,554	91,800	156,537
1991	162	0	3,676	3,269	359	0	1,945	9,155	3,493	28,200	50,259
1992	217	0	5,177	2,188	154	0	6,933	12,621	6,532	42,839	76,661
1993	190	0	5,643	8,430	5,964	1,650	13,208	1,792	6,829	62,065	105,971
1994	132	0	4,482	5,427	822	0	9,679	3,379	19,532	57,115	100,568
1995	278	0	6,236	7,195	955	0	15,427	21	17,772	28,756	76,640
1996	277	0	6,151	5,119	388	0	6,968	1,871	11,591	44,850	77,215
1997	138	0	6,647	6,501	1,582	1,323	12,654	1,876	10,864	60,601	102,186
1998	106	0	3,748	2,493	1,277	0	8,347	3,817	11,478	39,610	70,876
1999	148	0	5,048	8,227	1,444	0	13,133	5,326	16,226	52,945	102,497
2000	110	0	7,464	9,761	946	0	16,396	4,498	18,100	78,258	135,533
2001	105	0	7,822	4,879	3,010	0	13,593	0	18,004	47,922	95,335
2002	93	0	7,758	11,619	2,446	0	17,058	5,112	20,616	58,875	123,577
2003	108	0	7,916	11,348	2,887	0	16,684	5,037	12,753	75,981	132,714
2004	72	0	11,754	9,737	3,763	0	21,260	4,968	14,916	59,458	125,928
2005	1,430	0	11,520	10,100	1,826	0	16,597	4,139	10,160	52,364	108,136
2006	830	0	11,546	4,097	2,123	0	19,870	2,708	12,924	64,174	118,272
2007	179	0	10,066	2,563	3,107	0	23,205	8,255	15,107	71,690	134,172
2008	238	0	11,424	2,206	1,939	0	25,363	4,421	19,481	52,530	116,562
2009	211	0	7,054	5,437	1,987	0	16,398	2,551	16,945	66,364	116,947
2010	160	0	7,788	7,528	1,824	0	17,043	330	15,241	45,888	95,802
2011	1,541	0	6,282	6,887	2,173	0	20,098	7	15,203	60,761	112,952
2012	1,235	0	9,250	7,152	2,020	0	25,314	7,129	13,613	63,500	129,213
2013	1,236	0	6,250	6,152	1,770	0	24,963	5,729	19,471	60,000	125,571
2014	1,236	0	6,400	7,652	1,770	0	26,313	5,729	19,471	57,000	125,571
2015	1,236	0	6,500	13,652	1,770	0	27,213	5,729	19,471	57,000	132,571
2016	236	0	6,700	16,152	1,770	0	25,513	5,729	19,471	57,000	132,571
2017	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2018	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2019	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2020	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2021	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2022	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2023	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2024	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2025	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2026	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2027	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2028	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2029	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2030	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2031	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2032	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2033	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2034	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
2035	460	0	20,400	8,500	3,770	0	20,241	5,729	19,471	57,000	135,571
TOTAL	37,529	53,844	689,001	424,300	136,407	11,722	924,739	447,627	860,896	4,606,965	8,193,030

(b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 3 of 17

Calendar Year	CALIFORNIA AQUEDUCT										
	NORTH SAN JOAQUIN DIVISION							SAN LUIS DIVISION			
	Reach 1	Reach 2A					Reach 3		Reach 3A		
	KCWA (AG)	AC FC&WCD	KCWA (M&I) (AG)		OFWD (c)	SCVWD	TLBWS	DRWD	MWDSC	AVEK	CLWA
[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	3,084	0	0	0	0	0	0
1969	0	0	0	0	3,016	0	0	0	0	0	0
1970	0	0	0	0	5,911	0	0	0	0	0	0
1971	0	0	0	0	7,212	0	0	0	0	0	0
1972	0	0	0	0	8,166	0	0	0	0	0	0
1973	0	0	0	0	3,214	0	0	0	0	0	0
1974	0	0	0	0	3,471	0	0	0	0	0	0
1975	0	0	0	0	3,576	0	0	0	0	0	0
1976	0	0	0	0	4,112	0	0	0	0	0	0
1977	0	0	0	0	1,472	0	0	0	0	0	0
1978	0	0	0	0	3,906	0	0	0	0	0	0
1979	0	0	0	0	6,149	0	0	0	0	0	0
1980	0	0	0	0	5,700	0	0	0	0	0	0
1981	0	0	0	0	4,300	0	0	0	0	0	0
1982	0	0	0	0	3,838	0	0	0	0	0	0
1983	0	0	0	0	3,822	0	0	0	0	0	0
1984	0	0	0	0	5,700	0	0	0	0	0	0
1985	0	0	0	0	5,433	0	0	0	0	0	0
1986	0	0	0	0	5,107	0	0	0	0	0	0
1987	0	0	0	0	5,625	0	0	0	0	0	0
1988	0	0	0	0	4,412	0	0	0	0	0	0
1989	0	0	0	0	6,091	0	300	602	0	0	0
1990	0	0	0	0	2,922	200	0	0	0	0	0
1991	0	0	0	0	141	0	0	0	0	0	0
1992	0	0	0	0	2,239	0	0	0	0	0	0
1993	0	0	0	0	2,858	0	0	0	0	0	0
1994	0	0	0	0	3,071	0	0	0	0	0	0
1995	0	0	0	0	5,169	0	0	0	0	0	0
1996	0	0	0	0	4,904	0	0	0	0	0	0
1997	0	0	0	0	5,238	0	0	0	11,100	0	0
1998	0	0	0	0	4,401	0	0	0	(11,100)	0	0
1999	0	0	0	0	4,871	0	0	0	0	0	0
2000	0	0	0	0	4,508	0	0	0	0	0	0
2001	0	0	0	638	3,592	0	0	0	0	0	0
2002	0	0	0	773	4,885	0	0	0	0	0	0
2003	0	7	0	917	4,266	0	0	0	0	0	0
2004	0	38	0	786	4,629	0	0	0	0	0	0
2005	0	299	0	1,046	4,194	0	0	0	0	0	0
2006	0	321	0	1,103	4,242	0	0	0	0	0	0
2007	0	320	0	1,031	3,567	0	0	0	0	0	0
2008	8,885	56	0	1,744	1,985	0	0	0	0	5,873	0
2009	0	0	0	1,169	1,993	0	0	0	0	0	3,300
2010	0	0	0	1,124	2,906	0	0	0	0	0	0
2011	0	0	0	1,112	2,715	0	0	0	0	0	0
2012	0	0	0	1,171	4,784	0	0	0	0	0	0
2013	0	0	0	1,171	3,420	0	0	0	0	0	0
2014	0	0	0	1,171	3,420	0	0	0	0	13,310	0
2015	0	0	0	1,171	3,420	0	0	0	0	11,170	0
2016	0	0	0	1,171	3,420	0	0	0	0	8,940	0
2017	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2018	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2019	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2020	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2021	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2022	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2023	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2024	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2025	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2026	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2027	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2028	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2029	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2030	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2031	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2032	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2033	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2034	0	0	0	1,171	3,420	0	0	0	0	6,690	0
2035	0	0	0	1,171	3,420	0	0	0	0	6,690	0
TOTAL	8,885	1,041	0	39,547	266,057	200	300	602	0	166,403	3,300

(c) Includes 425 AF of 1988 advance allocation and 141 AF of 1992 advance allocation.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 4 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)													
	SAN LUIS DIVISION (continued)													
	Reach 3A							Reach 4					Reach 5	
	CLAWA	KCWA		MWDSC	MWA	SGPWA	SLOC FC&WCD	SCVWD	TLWSD	DRWD	KCWA		TLBWS	CLWA
(M&I)		(AG)	(M&I)								(AG)			
[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	1,898	0	12,647	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	1,500	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	5,095
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	14,446	0	3,500	0	0	0
1996	0	0	0	0	0	0	0	0	0	1,125	4,162	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	1,300	0	0
2000	0	3,320	68,960	0	0	0	0	0	0	1,517	878	0	0	0
2001	0	0	140,242	0	0	0	0	30,000	0	0	0	0	0	0
2002	0	6,000	62,024	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	151,044	29,596	0	0	0	0	0	0	1,351	0	0	0
2004	0	0	44,877	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	109,712	50,000	0	0	0	8,804	277	0	7,000	0	0	0
2006	0	0	19,575	0	0	0	0	0	0	0	0	0	0	0
2007	0	71,567	116,272	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	94,562	0	0	0	0	0	0	0	10,721	0	0	0
2009	0	0	158,590	52,933	0	0	0	9,999	0	0	0	0	0	0
2010	0	0	35,896	120,274	0	0	0	9,993	0	0	0	0	0	0
2011	0	0	0	78,324	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	14,910	0	0	0	0	0	0	0	0	0
2014	2,030	0	10,130	140,000	598	2,040	8,750	3,000	0	0	0	0	0	0
2015	1,980	0	10,130	140,000	2,398	1,420	8,750	3,000	0	0	0	0	0	0
2016	1,900	0	10,130	140,000	0	800	8,750	3,000	0	0	0	0	0	0
2017	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2018	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2019	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2020	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2021	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2022	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2023	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2024	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2025	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2026	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2027	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2028	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2029	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2030	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2031	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2032	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2033	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2034	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
2035	1,820	0	10,130	140,000	0	1,280	8,750	3,000	0	0	0	0	0	0
TOTAL	40,490	80,887	1,224,614	3,411,127	17,906	28,580	192,500	124,796	277	16,344	2,642	40,259	2,800	5,095

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 5 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)						SOUTH SAN JOAQUIN DIVISION					
	Reach 5						Reach 6					
	DRWD	EWSID	KCWA		MWDSC	OFWD	TLBWSD	KCWA		CK	EWSID	MWDSC
(M&I)			(AG)	(AG)				(M&I)				
[49]	[50]	[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]	[59]	[60]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	1,550	0	0	0	0	0
1989	0	0	0	18,831	0	0	0	0	8,260	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	10,823	0	0	0	0	0	0	0	0	0	0	0
1993	27,200	0	0	28,200	0	2,000	1,624	0	31,200	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	21,776	0	0	0	0	3,932	0	0	0
1996	0	0	1,125	81,507	0	0	4,000	0	0	0	0	0
1997	0	0	9,080	154,940	0	0	3,500	0	0	0	0	0
1998	0	0	0	0	0	0	0	20,400	33,340	0	0	0
1999	0	0	0	0	21,500	0	8,000	0	33,776	0	0	11,000
2000	0	0	8,130	57,647	0	0	0	1,457	35,847	0	0	0
2001	0	0	0	0	0	0	2,457	0	0	0	0	0
2002	0	0	0	0	0	0	3,000	0	0	0	0	0
2003	0	0	0	0	0	0	3,900	0	0	0	0	0
2004	0	0	0	0	0	0	3,850	0	0	3,250	0	0
2005	0	0	0	0	0	0	1,000	0	0	6,954	0	0
2006	0	0	0	0	0	0	3,000	0	0	2,659	0	0
2007	0	0	0	0	0	0	3,600	0	0	3,119	0	0
2008	0	0	0	0	0	0	1,355	0	0	2,159	0	0
2009	0	870	0	0	0	0	1,490	0	0	1,779	0	0
2010	0	431	0	0	0	0	0	0	0	2,477	0	0
2011	0	0	0	0	0	0	0	0	0	2,964	400	0
2012	0	0	0	0	0	0	0	0	0	4,070	0	0
2013	0	0	0	0	0	0	0	0	0	3,120	0	0
2014	0	0	0	0	0	0	0	0	0	3,120	0	0
2015	0	0	0	0	0	0	0	0	0	3,120	0	0
2016	0	0	0	0	0	0	0	0	0	3,120	0	0
2017	0	0	0	0	0	0	0	0	0	3,120	0	0
2018	0	0	0	0	0	0	0	0	0	3,120	0	0
2019	0	0	0	0	0	0	0	0	0	3,120	0	0
2020	0	0	0	0	0	0	0	0	0	3,120	0	0
2021	0	0	0	0	0	0	0	0	0	3,120	0	0
2022	0	0	0	0	0	0	0	0	0	3,120	0	0
2023	0	0	0	0	0	0	0	0	0	3,120	0	0
2024	0	0	0	0	0	0	0	0	0	3,120	0	0
2025	0	0	0	0	0	0	0	0	0	3,120	0	0
2026	0	0	0	0	0	0	0	0	0	3,120	0	0
2027	0	0	0	0	0	0	0	0	0	3,120	0	0
2028	0	0	0	0	0	0	0	0	0	3,120	0	0
2029	0	0	0	0	0	0	0	0	0	3,120	0	0
2030	0	0	0	0	0	0	0	0	0	3,120	0	0
2031	0	0	0	0	0	0	0	0	0	3,120	0	0
2032	0	0	0	0	0	0	0	0	0	3,120	0	0
2033	0	0	0	0	0	0	0	0	0	3,120	0	0
2034	0	0	0	0	0	0	0	0	0	3,120	0	0
2035	0	0	0	0	0	0	0	0	0	3,120	0	0
TOTAL	38,023	1,301	18,335	362,901	21,500	2,000	42,326	21,857	146,355	101,191	400	11,000

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 6 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 6	Reach 7						Reach 8C				
	TLBWSD	CLWA	DRWD	KCWA		CK	MWDSC	TLBWSD	DRWD	EWSID	KCWA	
(M&I)				(AG)	(M&I)						(AG)	
	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	1,978	0	0
1969	0	0	0	0	0	0	0	0	0	56	0	0
1970	0	0	0	0	0	0	0	0	0	3,942	0	0
1971	0	0	0	0	0	0	0	0	0	5,990	0	0
1972	0	0	0	0	0	0	0	0	0	5,795	0	0
1973	0	0	0	0	0	0	0	0	0	3,000	0	0
1974	0	0	0	0	0	0	0	0	0	3,000	0	0
1975	0	0	0	0	0	0	0	0	0	3,000	0	0
1976	0	0	0	0	0	0	0	0	0	3,000	0	0
1977	0	0	0	0	0	0	0	0	0	738	0	0
1978	0	0	0	0	0	0	0	0	0	454	0	0
1979	0	0	0	0	0	0	0	0	0	1,739	0	0
1980	0	0	0	0	0	0	0	0	0	894	0	0
1981	0	0	0	0	0	0	0	0	0	5,859	0	0
1982	0	0	0	0	0	0	0	0	0	361	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	5,197	0	0
1986	0	0	0	0	0	0	0	0	0	1,170	0	0
1987	0	0	0	0	0	0	0	0	0	2,525	0	0
1988	0	0	0	0	0	0	0	0	0	3,475	0	0
1989	0	0	0	0	5,262	0	0	0	2,391	3,000	0	0
1990	0	0	0	0	0	0	0	0	0	1,279	0	0
1991	0	0	0	0	0	0	0	0	0	221	0	0
1992	0	0	0	0	0	0	0	0	280	1,354	0	0
1993	0	0	0	18,157	10,043	0	0	0	0	2,741	0	0
1994	0	2,100	0	0	0	0	0	0	0	1,666	0	0
1995	0	0	0	10,875	20,595	0	0	0	0	1,631	989	10,527
1996	0	0	0	3,424	69,704	0	0	0	95	1,868	0	1,500
1997	0	0	0	27,079	32,463	0	0	0	0	0	0	1,500
1998	3,000	0	200	3,998	62,081	0	0	0	90	542	0	1,000
1999	23,000	0	0	7,923	19,500	0	500	4,470	86	3,176	0	400
2000	3,000	1,200	0	0	45,137	0	20,000	20,500	166	1,799	0	400
2001	600	0	0	0	0	0	0	0	14	1,360	0	0
2002	0	0	0	0	0	0	0	12,067	0	1,405	0	0
2003	0	0	0	0	0	0	0	15,103	0	1,436	0	0
2004	0	0	0	0	0	0	0	0	0	3,562	0	0
2005	0	0	0	0	0	6,904	0	4,000	0	3,834	0	0
2006	0	0	0	0	0	2,500	0	6,000	0	3,282	0	0
2007	0	0	0	0	16,214	0	0	2,545	0	2,084	0	0
2008	0	0	400	0	1,998	1,330	0	1,500	0	947	0	0
2009	2,100	0	1,400	0	0	0	0	600	0	164	0	0
2010	0	0	0	0	0	0	0	3,850	0	2,828	0	0
2011	0	0	0	0	0	0	0	2,500	0	1,515	0	0
2012	0	0	0	0	0	0	0	0	0	3,400	0	0
2013	0	0	0	0	0	0	0	0	0	1,800	0	0
2014	0	0	0	0	0	0	0	0	0	1,800	0	0
2015	0	0	0	0	0	0	0	0	0	1,800	0	0
2016	0	0	0	0	0	0	0	0	0	1,800	0	0
2017	0	0	0	0	0	0	0	0	0	1,800	0	0
2018	0	0	0	0	0	0	0	0	0	1,800	0	0
2019	0	0	0	0	0	0	0	0	0	1,800	0	0
2020	0	0	0	0	0	0	0	0	0	1,800	0	0
2021	0	0	0	0	0	0	0	0	0	1,800	0	0
2022	0	0	0	0	0	0	0	0	0	1,800	0	0
2023	0	0	0	0	0	0	0	0	0	1,800	0	0
2024	0	0	0	0	0	0	0	0	0	1,800	0	0
2025	0	0	0	0	0	0	0	0	0	1,800	0	0
2026	0	0	0	0	0	0	0	0	0	1,800	0	0
2027	0	0	0	0	0	0	0	0	0	1,800	0	0
2028	0	0	0	0	0	0	0	0	0	1,800	0	0
2029	0	0	0	0	0	0	0	0	0	1,800	0	0
2030	0	0	0	0	0	0	0	0	0	1,800	0	0
2031	0	0	0	0	0	0	0	0	0	1,800	0	0
2032	0	0	0	0	0	0	0	0	0	1,800	0	0
2033	0	0	0	0	0	0	0	0	0	1,800	0	0
2034	0	0	0	0	0	0	0	0	0	1,800	0	0
2035	0	0	0	0	0	0	0	0	0	1,800	0	0
TOTAL	31,700	3,300	2,000	71,456	282,997	10,734	20,500	73,135	3,122	138,667	989	15,327

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 7 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 8C	Reach 8D							Reach 9	
	CK	TLBWSD	DRWD	KCWA		CK	SLOC	TLBWSD	DRWD	
(M&I)				(AG)						
	[73]	[74]	[75]	[76]	[77]	[78]	[79]	[80]	[81]	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	900	25,100	26,360	0	0	0	0	0	0	
1969	100	7,081	31,375	0	0	0	0	0	0	
1970	0	0	40,407	0	0	0	0	3,408	0	
1971	3,700	80,906	41,053	0	0	0	0	41,579	0	
1972	1,400	144,843	42,443	0	0	0	0	113,550	0	
1973	1,500	26,317	22,057	0	1,500	0	0	24,147	0	
1974	1,500	32,603	33,390	0	0	0	0	39,686	0	
1975	1,600	41,536	40,555	0	0	0	0	44,722	0	
1976	1,600	26,595	41,421	0	0	0	0	32,216	0	
1977	1,530	12,984	11,153	0	0	0	0	5,097	0	
1978	2,070	3,934	51,747	0	0	0	0	8,119	0	
1979	2,000	74,758	38,544	0	0	0	0	80,363	0	
1980	2,200	35,140	41,000	0	0	0	0	40,304	0	
1981	2,300	50,888	41,000	0	0	0	0	32,550	0	
1982	1,536	4,405	41,000	0	0	214	0	14,146	0	
1983	3,550	1,001	42,900	0	0	0	0	5	0	
1984	3,100	3,677	45,100	0	0	0	0	2,066	0	
1985	3,400	68,638	46,251	0	0	0	0	41,153	0	
1986	3,700	40,017	50,249	0	0	0	0	39,338	0	
1987	4,000	30,359	46,288	0	0	0	0	62,725	0	
1988	4,000	46,281	47,994	0	0	0	0	48,035	0	
1989	4,000	63,703	52,158	0	0	0	0	63,947	0	
1990	2,000	23,504	36,296	0	161	0	0	32,066	0	
1991	0	1,697	927	0	0	0	0	483	0	
1992	1,806	15,982	12,667	0	0	0	0	30,746	0	
1993	4,000	57,112	23,221	0	0	0	0	65,732	197	
1994	2,116	21,510	28,793	0	1,726	0	0	40,852	0	
1995	4,000	40,934	45,240	2,959	27,270	0	0	57,435	0	
1996	4,000	84,130	52,722	0	1,455	0	100	148,745	0	
1997	0	9,467	57,496	0	0	0	100	9,402	4,900	
1998	15	8,956	49,435	0	20,000	0	0	8,721	0	
1999	4,000	90,334	58,290	0	9,000	0	0	162,631	0	
2000	3,600	63,842	57,920	0	0	0	0	113,952	0	
2001	1,560	23,300	40,155	0	6,089	0	0	58,369	0	
2002	2,854	34,009	48,179	0	7,522	0	0	47,426	0	
2003	3,692	25,317	45,732	0	8,350	0	0	61,521	0	
2004	5,803	30,546	45,823	0	4,979	0	0	55,625	0	
2005	4,057	42,450	58,627	0	0	1,891	0	92,552	0	
2006	1,105	34,367	61,410	0	0	3,266	0	64,840	0	
2007	657	31,305	39,974	0	7,740	1,921	0	49,633	0	
2008	240	14,146	18,974	0	21,242	107	0	16,903	0	
2009	1,612	13,522	12,037	0	19,684	0	0	16,794	5,500	
2010	26	14,005	17,346	0	14,094	1,900	0	40,609	0	
2011	2,160	23,814	22,427	0	65	1,194	0	30,827	0	
2012	2,988	38,048	35,070	0	0	0	0	48,720	0	
2013	2,280	21,341	30,206	0	0	0	0	32,012	0	
2014	2,280	21,341	30,206	0	0	0	0	32,012	0	
2015	2,280	21,341	30,206	0	0	0	0	32,012	0	
2016	2,280	21,341	30,206	0	0	0	0	32,012	0	
2017	2,280	21,341	30,206	0	0	0	0	32,012	0	
2018	2,280	21,341	30,206	0	0	0	0	32,012	0	
2019	2,280	21,341	30,206	0	0	0	0	32,012	0	
2020	2,280	21,341	30,206	0	0	0	0	32,012	0	
2021	2,280	21,341	30,206	0	0	0	0	32,012	0	
2022	2,280	21,341	30,206	0	0	0	0	32,012	0	
2023	2,280	21,341	30,206	0	0	0	0	32,012	0	
2024	2,280	21,341	30,206	0	0	0	0	32,012	0	
2025	2,280	21,341	30,206	0	0	0	0	32,012	0	
2026	2,280	21,341	30,206	0	0	0	0	32,012	0	
2027	2,280	21,341	30,206	0	0	0	0	32,012	0	
2028	2,280	21,341	30,206	0	0	0	0	32,012	0	
2029	2,280	21,341	30,206	0	0	0	0	32,012	0	
2030	2,280	21,341	30,206	0	0	0	0	32,012	0	
2031	2,280	21,341	30,206	0	0	0	0	32,012	0	
2032	2,280	21,341	30,206	0	0	0	0	32,012	0	
2033	2,280	21,341	30,206	0	0	0	0	32,012	0	
2034	2,280	21,341	30,206	0	0	0	0	32,012	0	
2035	2,280	21,341	30,206	0	0	0	0	32,012	0	
TOTAL	154,417	2,053,906	2,437,944	2,959	150,877	10,493	200	2,728,016	10,597	

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 8 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 9				Reach 10A								
	KCWA		TLBWSD	AC			CLWA	DRWD	KCWA		MWDSC	SCVWD	TLBWSD
	(M&I)	(AG)		FC&WCD	ACWD	(M&I)			(AG)				
[82]	[83]	[84]	[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]		
1962	0	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	
1968	0	30,951	0	0	0	0	0	0	0	0	0	0	
1969	0	24,489	0	0	0	0	0	0	0	0	0	2,842	
1970	0	46,114	1,855	0	0	0	0	0	158	0	0	4,315	
1971	0	58,356	0	0	0	0	0	0	9,973	0	0	0	
1972	0	75,464	0	0	0	0	0	0	5,876	0	0	0	
1973	0	54,583	0	0	0	0	0	0	22,948	0	0	0	
1974	0	63,814	0	0	0	0	0	10,019	22,719	0	0	0	
1975	0	50,021	0	0	0	0	0	2,791	72,121	0	0	0	
1976	0	53,465	0	0	0	0	0	74	50,444	0	0	0	
1977	0	24,668	0	0	0	0	0	201	34,451	0	0	0	
1978	0	72,231	0	0	0	0	0	0	161,889	0	0	0	
1979	0	74,524	0	0	0	0	0	285	153,245	0	0	0	
1980	0	79,946	0	0	0	0	0	3,780	131,836	0	0	0	
1981	0	76,508	0	0	0	0	0	341	133,500	0	0	0	
1982	0	76,877	0	0	0	0	0	4,700	164,832	0	0	0	
1983	2,217	84,573	0	0	0	0	0	0	146,493	0	0	0	
1984	4,100	85,732	0	0	0	0	0	6,910	150,302	0	0	0	
1985	0	67,696	0	0	0	0	0	6,495	153,473	0	0	0	
1986	0	79,943	0	0	0	0	0	5,065	198,099	0	0	0	
1987	0	97,732	0	0	0	0	0	900	226,521	0	0	0	
1988	1,100	83,858	0	0	0	0	0	9,529	212,495	0	0	0	
1989	0	91,134	0	0	0	0	0	21,038	251,979	0	0	0	
1990	0	83,108	0	0	0	0	0	25,189	47,472	0	0	0	
1991	13,683	601	0	0	0	0	0	1,142	6,820	0	0	0	
1992	28	40,183	0	0	0	0	0	3,685	89,390	0	0	0	
1993	5,945	53,597	0	0	0	0	0	775	233,862	44,496	0	0	
1994	0	44,994	0	0	0	0	0	5,227	126,792	0	0	0	
1995	0	64,076	0	0	0	0	0	366	229,448	50,000	0	0	
1996	2,236	89,291	0	0	6,200	0	0	6,666	199,854	95,000	45,000	0	
1997	0	72,013	0	0	10,000	0	900	3,577	157,385	125,000	35,000	0	
1998	0	57,530	0	1,970	3,780	0	0	2,603	163,587	39,500	23,800	0	
1999	0	72,734	0	22,910	16,100	0	0	1,657	190,787	75,850	30,000	0	
2000	0	73,562	0	23,940	13,380	0	0	7,672	283,208	0	23,730	0	
2001	0	54,198	0	5,000	0	0	0	160	98,175	0	0	0	
2002	0	60,957	0	14,287	2,083	24,000	0	145	171,498	0	3,311	0	
2003	0	54,724	0	6,500	18,800	0	0	217	174,674	70,940	33,000	0	
2004	0	54,330	0	5,740	8,000	32,522	0	65,751	117,286	0	0	0	
2005	0	53,206	0	0	28,422	0	0	146	232,519	31,210	55,448	0	
2006	0	56,909	0	5,740	27,447	0	5,000	0	237,623	0	64,036	0	
2007	0	66,918	0	717	1,029	0	3,000	0	203,794	0	3,692	0	
2008	0	63,315	0	0	0	0	2,900	1,702	103,176	0	4,306	0	
2009	0	64,007	2,330	0	0	0	2,000	690	95,798	0	0	0	
2010	0	76,357	0	3,000	7,000	0	2,000	14	102,773	74,000	51,990	800	
2011	0	78,469	2,000	3,414	16,020	0	2,400	26	133,984	149,012	69,770	500	
2012	0	73,866	0	5,700	7,302	0	0	0	136,811	0	48,000	0	
2013	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2014	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2015	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2016	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2017	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2018	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2019	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2020	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2021	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2022	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2023	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2024	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2025	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2026	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2027	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2028	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2029	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2030	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2031	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2032	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2033	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2034	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
2035	0	57,366	0	0	0	0	0	0	131,811	0	12,000	0	
TOTAL	29,309	4,180,142	6,185	98,918	165,563	56,522	18,100	199,538	8,881,853	755,008	767,083	8,457	

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 9 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 11B				Reach 12D			Reach 12E				KCWA	
	DRWD	KCWA		TLBWSD	KCWA		FC&WCD	ACWD	CLWA	DRWD	KCWA		
(M&I)		(AG)	(M&I)		(AG)	(M&I)					(AG)		
[94]	[95]	[96]	[97]	[98]	[99]	[100]	[101]	[102]	[103]	[104]	[105]		
1962	0	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	24,776	0	0	0	0	0	0	0	0	0	
1969	0	0	64,682	0	0	0	0	0	0	0	0	0	
1970	0	0	72,279	0	0	0	0	0	0	0	0	9,279	
1971	0	0	63,773	0	0	0	0	0	0	0	0	28,056	
1972	0	0	72,358	0	0	0	0	0	0	0	0	62,342	
1973	0	0	67,544	0	0	0	0	0	0	0	0	13,082	
1974	0	0	87,476	0	0	0	0	0	0	2,651	0	4,248	
1975	0	0	85,675	0	0	0	0	0	0	0	0	10,787	
1976	0	0	85,067	0	0	0	0	0	0	37,519	0	20,555	
1977	0	3,981	29,603	0	0	0	0	0	0	20,280	0	1,737	
1978	0	0	88,753	0	0	0	0	0	0	47,133	0	15,011	
1979	0	484	108,379	0	0	0	0	0	0	50,740	0	61,567	
1980	0	3,112	103,207	0	0	0	0	0	0	32,039	0	22,252	
1981	0	494	104,395	0	0	0	0	0	0	59,917	0	58,470	
1982	0	798	99,081	0	0	0	0	0	0	36,139	0	75,587	
1983	0	2,069	94,117	0	0	0	0	0	0	0	0	10,950	
1984	0	2,349	124,819	0	0	0	0	0	0	63,941	0	39,929	
1985	0	10,666	118,646	0	0	0	0	0	0	69,839	0	84,117	
1986	0	8,673	124,836	0	0	0	0	0	0	62,109	0	51,540	
1987	0	13,074	111,877	0	0	0	0	0	0	95,297	0	86,223	
1988	0	13,509	114,031	0	0	0	0	0	0	86,390	0	123,249	
1989	0	9,986	127,058	0	0	0	0	0	0	83,965	0	146,544	
1990	0	9,319	104,107	0	0	0	0	0	0	82,164	0	38,973	
1991	0	6,099	118	0	0	0	0	0	0	8,842	0	303	
1992	0	7,419	35,093	0	0	0	0	0	0	47,181	0	57,048	
1993	0	2,696	72,645	0	0	0	0	0	0	34,822	0	285,554	
1994	0	3,506	71,202	0	0	0	0	0	0	66,188	0	77,839	
1995	0	1,154	97,072	0	0	0	0	0	1,000	107,130	0	181,097	
1996	0	1,185	96,250	0	0	0	0	0	4,131	89,257	0	134,138	
1997	0	1,111	104,823	0	0	0	0	0	0	32,061	0	128,329	
1998	0	1,311	72,646	0	0	0	0	0	5,925	28,258	0	88,998	
1999	0	2,127	92,262	0	21	0	0	0	0	110,161	0	255,343	
2000	1,500	3,793	89,622	0	21	0	0	0	953	11,772	0	156,215	
2001	0	636	73,105	0	41	0	0	0	0	385	0	51,076	
2002	0	1,457	91,123	0	760	6	0	0	0	0	0	135,335	
2003	0	1,379	87,174	0	2,431	152	0	0	0	39,479	0	112,056	
2004	0	1,299	97,722	0	3,419	768	0	0	0	52,303	0	95,893	
2005	0	824	93,554	0	2,841	644	3,419	1,878	20,000	43,835	0	340,281	
2006	0	0	98,417	0	2,513	1,556	10,000	0	20,000	82,207	0	296,230	
2007	0	4,030	94,334	0	2,164	2,284	0	0	8,200	1,179	0	87,764	
2008	0	263	93,417	0	1,514	3,000	0	0	0	0	0	76,351	
2009	300	127	96,776	0	564	4,274	0	0	0	0	0	82,434	
2010	5,350	381	92,220	974	1,904	2,206	10,000	0	25,844	4,851	0	72,809	
2011	0	1,160	105,682	3,500	973	65	10,000	1,960	5,608	26,249	0	307,215	
2012	0	9,000	53,254	0	7,200	0	10,000	0	16,720	51,744	0	82,236	
2013	0	9,000	44,254	0	7,200	0	10,000	0	15,920	49,744	0	68,236	
2014	0	9,000	44,254	0	7,200	0	7,000	0	16,120	49,744	0	68,236	
2015	0	9,000	44,254	0	7,200	0	0	0	13,920	49,744	0	68,236	
2016	0	9,000	44,254	0	7,200	0	0	0	13,720	49,744	0	57,236	
2017	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2018	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2019	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2020	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2021	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2022	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2023	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2024	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2025	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2026	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2027	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2028	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2029	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2030	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2031	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2032	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2033	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2034	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
2035	0	9,000	44,254	0	7,200	0	0	0	13,420	49,744	0	68,236	
TOTAL	7,150	336,471	4,902,892	4,474	191,945	14,955	60,419	3,838	411,032	24,096	2,862,139	5,627,470	

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 10 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 12E			Reach 13B									
	MWDSC	SBVMWD	SCVWD	AC			KCWA		MWDSC	PWD	SBC FC&WCD	SCVWD	TLBWSD
FC&WCD				ACWD	DRWD	(M&I)	(AG)						
[106]	[107]	[108]	[109]	[110]	[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	4,891	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	17,388	0	0	0	0
1973	0	0	0	0	0	0	0	0	9,297	0	0	0	0
1974	0	0	0	0	0	0	0	0	4,246	0	0	0	0
1975	0	0	0	0	0	0	0	0	8,538	0	0	0	0
1976	0	0	0	0	0	0	0	0	5,626	8,855	0	0	0
1977	0	0	0	0	0	0	0	0	0	5,024	0	0	0
1978	0	0	0	0	0	0	0	0	21,773	7,601	0	0	0
1979	0	0	0	0	0	0	0	0	5,663	17,766	0	0	0
1980	0	0	0	0	0	0	0	0	0	22,515	0	0	0
1981	0	0	0	0	0	0	0	0	7,844	14,037	0	0	0
1982	0	0	0	0	0	0	0	0	0	25,553	0	0	0
1983	0	0	0	0	0	0	0	0	0	3,491	0	0	0
1984	0	0	0	0	0	0	0	0	12,117	26,178	0	0	0
1985	0	0	0	0	0	0	0	0	0	67,711	0	0	0
1986	0	0	0	0	0	0	0	0	0	66,551	0	0	0
1987	0	0	0	0	0	0	0	0	5,609	40,374	0	0	0
1988	0	0	0	0	0	0	0	0	9,298	47,167	0	0	0
1989	0	0	0	0	0	0	0	0	5,504	57,114	0	0	0
1990	0	0	0	0	0	0	0	0	7,645	20,423	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	789	17,449	0	0	0
1993	5,504	0	0	0	0	0	0	0	12,798	88,157	0	0	0
1994	0	0	0	0	0	0	0	0	2,494	33,148	0	0	0
1995	0	0	0	0	0	0	0	0	8,751	110,685	0	0	3,500
1996	0	0	0	0	0	0	0	0	28,063	64,849	0	0	0
1997	1,486	0	0	0	0	0	0	0	43,803	49,312	0	0	0
1998	24,234	0	0	0	0	0	0	0	29,444	40,085	5,500	0	0
1999	62,162	0	0	0	0	0	0	0	12,969	92,998	0	0	0
2000	149,731	0	0	0	0	0	0	0	0	102,202	0	0	0
2001	0	0	0	0	0	1,733	0	0	0	33,925	0	0	0
2002	0	0	0	0	0	736	0	0	0	71,444	0	0	0
2003	45,989	0	0	0	0	350	2,396	124,582	1,865	0	0	0	0
2004	0	0	0	0	0	1,657	1,922	73,801	0	0	0	0	0
2005	15,384	0	2,619	2,321	0	14,540	21,781	269,631	192	0	0	9,014	0
2006	5,065	0	0	0	0	5,670	11,787	196,116	0	0	0	0	0
2007	0	0	0	0	0	2,161	0	72,240	0	0	0	0	0
2008	0	0	0	0	0	0	0	9,785	0	0	0	2,324	0
2009	0	0	0	0	0	0	0	12,060	0	0	0	0	0
2010	134,855	0	0	0	0	304	0	63,966	22,000	0	0	0	10,000
2011	109,364	8,066	706	2,331	3,420	34,733	4,896	274,120	25,000	4,452	2,548	0	0
2012	0	0	0	0	0	0	4,800	29,947	0	0	0	0	0
2013	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2014	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2015	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2016	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2017	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2018	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2019	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2020	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2021	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2022	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2023	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2024	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2025	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2026	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2027	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2028	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2029	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2030	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2031	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2032	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2033	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2034	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2035	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
TOTAL	1,427,774	8,066	3,325	4,652	3,420	61,884	394,948	2,889,024	54,557	4,452	2,548	11,338	13,500

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 11 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 14A		Reach 14B		Reach 14C			Reach 15A		Reach 16A		
	KCWA		KCWA		KCWA		MWDSC	KCWA		AVEKWA	KCWA	
	(M&I)	(AG)	(M&I)	(AG)	(M&I)	(AG)		(M&I)	(AG)		(M&I)	(AG)
	[119]	[120]	[121]	[122]	[123]	[124]	[125]	[126]	[127]	[128]	[129]	[130]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	3	0	0	0	0	0	0	0	0
1971	0	23,844	0	49,929	0	24,187	0	0	3,552	0	0	0
1972	0	26,621	0	77,034	0	35,016	0	0	6,064	0	0	4,768
1973	0	15,328	0	47,040	0	19,043	0	0	19,916	0	0	1,961
1974	0	7,794	0	32,356	0	12,601	0	0	18,000	0	3,000	1,564
1975	0	10,306	0	27,736	0	12,783	0	0	35,420	0	3,200	9,867
1976	0	268	0	35,296	0	9,005	0	0	39,551	0	3,500	11,667
1977	0	8,299	0	13,539	0	3,757	0	0	6,158	0	3,420	685
1978	0	34,029	0	72,351	0	24,542	0	0	31,148	0	7,989	1,655
1979	3,012	27,356	0	59,413	0	22,372	0	0	38,602	0	2,813	15,808
1980	4,312	16,876	0	40,513	0	19,953	0	0	37,817	0	2,700	16,145
1981	4,511	13,007	8	42,753	7	18,729	0	0	39,033	0	2,636	18,156
1982	3,735	24,240	184	57,739	0	26,479	0	0	47,782	0	1,921	16,577
1983	1,168	20,302	0	57,922	0	26,613	0	0	37,426	0	1,400	17,907
1984	137	35,369	10	79,179	2	34,996	0	0	49,848	0	1,338	24,246
1985	206	33,103	0	72,855	0	31,758	0	0	44,078	0	1,309	16,820
1986	180	26,384	0	70,864	0	34,566	0	0	42,461	0	1,213	15,559
1987	610	30,098	9	67,710	10	31,019	0	0	34,748	0	1,665	10,170
1988	622	32,778	19	75,968	1	37,165	0	16	41,978	0	1,925	8,987
1989	721	29,292	7	82,201	5	37,800	0	2	43,239	0	2,668	8,649
1990	673	26,800	13	81,076	9	34,174	0	6	36,347	0	2,819	8,608
1991	768	0	0	0	0	0	0	0	0	2,000	2,588	343
1992	673	16,238	464	41,143	0	18,084	0	0	24,243	0	2,087	8,275
1993	629	17,932	0	62,493	0	28,103	0	0	27,997	0	2,494	9,167
1994	2,513	16,760	3,000	54,011	1,000	22,624	0	0	29,511	0	3,011	13,877
1995	3	21,234	0	67,391	0	31,285	0	0	26,134	0	3,188	15,042
1996	0	26,978	0	85,936	0	38,879	0	0	36,186	0	2,573	18,142
1997	0	23,035	0	79,790	0	33,512	0	0	36,281	0	3,997	17,048
1998	0	15,706	0	58,132	0	23,097	0	0	28,712	0	3,751	17,032
1999	0	21,153	0	67,576	0	31,489	0	0	36,801	0	3,316	24,071
2000	0	19,264	0	70,585	0	33,716	0	0	40,063	0	3,015	20,919
2001	0	12,452	0	49,602	0	23,557	0	0	31,192	0	1,894	13,476
2002	0	11,161	0	52,762	0	27,138	0	0	41,552	0	4,227	14,520
2003	0	13,685	0	44,576	0	24,783	12,911	0	36,602	0	1,168	16,799
2004	0	13,030	0	52,012	0	30,313	0	0	40,184	0	2,239	19,714
2005	0	15,663	0	56,739	0	21,979	0	0	39,870	0	167	18,353
2006	0	17,779	0	65,142	1,413	20,193	5,440	0	46,244	0	279	22,570
2007	0	21,435	0	67,955	0	24,947	1,881	0	47,390	0	204	26,229
2008	0	20,087	0	63,497	0	27,847	0	0	33,029	0	3,834	18,426
2009	0	22,281	0	60,726	0	27,185	0	0	26,007	0	1,531	19,517
2010	0	21,964	0	58,110	0	25,477	29,818	0	22,045	0	1,033	19,829
2011	0	24,131	0	61,859	0	27,061	27,326	0	42,158	0	3,808	17,957
2012	0	24,300	0	51,100	0	22,100	0	0	27,153	0	3,966	16,600
2013	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2014	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2015	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2016	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2017	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2018	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2019	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2020	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2021	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2022	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2023	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2024	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2025	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2026	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2027	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2028	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2029	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2030	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2031	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2032	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2033	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2034	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2035	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
TOTAL	24,473	1,226,962	3,714	3,355,314	2,447	1,513,027	77,376	24	1,997,041	2,000	260,104	890,505

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 12 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION									
	Reach 18A		Reach 19		Reach 20A			Reach 20B		Reach 21
	AVEKWA	AVEKWA	MWA	AVEKWA	MWA	PWD	AVEKWA	LCID	PWD	AVEKWA
[131]	[132]	[133]	[134]	[135]	[136]	[137]	[138]	[139]	[140]	
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	1,223	0	0	0	0	0	0	0	0
1975	0	7,622	0	420	0	0	0	0	0	0
1976	3,808	23,063	0	471	0	0	416	0	0	0
1977	1,231	8,927	0	773	0	0	271	0	0	0
1978	1,321	36,333	0	5,549	0	0	934	0	0	0
1979	2,098	49,910	0	7,555	0	0	930	0	0	0
1980	2,610	61,534	0	7,605	0	0	655	0	0	0
1981	2,340	65,690	0	10,333	0	0	966	0	0	0
1982	1,669	41,127	0	7,313	0	0	8	0	0	0
1983	43	26,377	0	6,253	0	0	20	0	0	0
1984	90	22,462	0	9,558	0	0	2	0	0	0
1985	8	23,440	0	11,613	0	1,510	217	0	32	0
1986	8	16,898	0	13,808	0	3,041	0	0	45	0
1987	0	15,958	0	15,493	0	2,389	151	0	1,624	0
1988	0	13,471	0	17,117	0	366	281	0	1,261	0
1989	0	18,007	0	23,481	0	381	112	0	7,848	0
1990	0	17,281	0	25,843	0	282	84	0	8,292	0
1991	0	728	0	4,282	1,391	84	131	0	3,830	0
1992	0	7,238	0	18,518	1,310	185	650	0	3,850	0
1993	0	13,340	0	23,662	1,514	164	996	0	7,597	0
1994	0	19,122	0	25,250	1,399	299	124	0	8,119	0
1995	0	20,222	0	22,385	1,227	328	0	0	6,633	0
1996	0	23,919	0	26,979	1,316	354	0	0	11,080	0
1997	0	28,834	64	27,999	1,272	313	0	0	11,548	0
1998	0	22,466	1,345	25,985	0	195	0	0	8,557	0
1999	0	30,944	1,439	32,409	0	377	36	0	12,901	0
2000	0	34,786	1,361	37,819	0	0	80	0	9,060	5,002
2001	0	24,370	1,385	33,216	0	0	282	0	10,427	0
2002	0	14,297	1,370	36,311	0	0	1,662	0	18,496	0
2003	0	12,145	1,285	39,532	0	0	2,289	0	11,547	0
2004	0	11,201	1,223	40,408	0	0	1,774	0	12,139	0
2005	11	11,804	1,051	41,496	0	0	1,336	0	11,678	0
2006	0	18,438	1,021	53,878	0	0	1,415	0	12,487	0
2007	0	22,916	1,176	47,639	0	0	1,349	0	19,609	0
2008	0	9,096	1,238	33,919	0	0	792	25	14,255	0
2009	0	5,717	1,345	35,402	0	0	366	42	15,339	0
2010	0	10,825	1,181	43,122	0	0	643	0	10,969	0
2011	0	55,707	2,184	35,543	0	0	507	0	9,881	0
2012	0	8,530	0	43,550	0	200	1,030	0	15,243	0
2013	2,000	15,450	3,150	59,670	0	0	1,525	0	12,780	0
2014	2,050	15,900	900	45,620	0	0	1,580	0	12,780	0
2015	2,100	16,380	900	46,980	0	0	1,630	0	12,780	0
2016	2,150	16,890	898	48,400	0	0	1,680	0	12,780	0
2017	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2018	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2019	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2020	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2021	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2022	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2023	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2024	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2025	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2026	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2027	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2028	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2029	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2030	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2031	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2032	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2033	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2034	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
2035	2,200	17,400	898	49,840	0	0	1,730	0	12,780	0
TOTAL	65,337	1,251,188	41,578	2,040,119	9,429	10,468	59,794	67	558,287	5,002

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 13 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION										
	Reach 21		Reach 22A		Reach 22B				Reach 23	Reach 24	
	LCID	PWD	AVEKWA	LCID	AVEKWA (d)	CVWD (e)	DWA (e)	MWDSC (e)	MWA	MWA	CLAWA
[141]	[142]	[143]	[144]	[145]	[146]	[147]	[148]	[149]	[150]	[151]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	338	0	0	0	0	0	0	0	55	0	464
1973	290	0	0	0	0	5,800	9,000	(14,800)	0	0	389
1974	400	0	0	0	0	6,400	10,000	(16,400)	0	14	627
1975	520	0	0	0	0	7,000	11,000	(18,000)	0	0	825
1976	589	0	0	0	0	7,600	12,000	(19,600)	0	0	1,002
1977	111	0	0	0	0	0	0	0	22	58	1,109
1978	208	0	0	0	0	10,084	15,300	(25,384)	0	0	1,209
1979	133	0	0	0	0	10,063	15,000	(25,063)	4,000	0	1,260
1980	191	0	3	0	0	10,884	17,000	(27,884)	4,000	0	1,239
1981	1,270	0	46	0	0	12,105	19,000	(31,105)	4,000	0	1,485
1982	0	0	174	0	0	13,326	21,000	(34,326)	10,500	0	1,238
1983	38	0	268	0	0	14,547	23,000	(37,547)	0	0	911
1984	1	0	550	0	0	15,768	25,000	(40,768)	0	0	1,128
1985	0	16	1,786	0	0	16,989	27,000	(43,989)	0	0	1,422
1986	163	10	1,735	0	0	18,210	29,000	(47,210)	0	0	1,506
1987	1,080	1,366	2,273	5	214	19,431	31,500	(50,931)	17	0	1,849
1988	419	143	3,210	0	0	20,652	34,000	(54,652)	9	0	2,006
1989	971	780	3,591	0	89	21,873	36,500	(58,373)	0	200	2,170
1990	1,747	34	3,988	0	10	23,100	38,100	(61,200)	0	0	1,827
1991	522	0	2,427	0	0	6,930	11,430	(18,360)	0	0	849
1992	251	0	3,859	0	0	10,427	17,197	(27,624)	42	0	519
1993	734	0	5,098	0	0	0	0	0	0	0	439
1994	1,098	0	4,657	0	0	0	0	0	14,634	0	785
1995	480	0	4,679	0	0	0	0	0	7,495	0	409
1996	494	0	5,458	0	0	0	0	0	6,111	0	485
1997	444	0	5,549	0	0	0	0	0	9,038	0	651
1998	404	0	4,468	0	0	0	0	0	2,580	0	187
1999	342	0	5,684	0	0	0	0	0	6,705	0	1,132
2000	0	0	5,890	0	0	0	0	0	10,019	0	1,194
2001	0	0	4,989	0	0	0	0	0	3,048	0	1,057
2002	0	0	5,404	0	497	0	0	0	2,976	0	2,189
2003	0	0	6,063	0	0	0	0	7,625	13,150	0	1,563
2004	0	23	6,095	0	253	0	0	0	11,953	0	2,006
2005	0	34	5,184	0	0	0	0	5,942	12,169	0	807
2006	0	5	6,653	0	0	0	0	0	32,993	0	641
2007	0	25	7,711	0	588	0	0	0	27,684	0	1,768
2008	0	0	4,756	0	0	0	0	0	20,479	0	848
2009	0	0	4,185	0	0	0	0	0	20,214	0	894
2010	0	0	3,899	0	0	0	0	0	27,640	0	357
2011	0	0	2,289	0	0	0	0	30,907	2,915	0	185
2012	1,380	0	4,670	0	0	0	0	0	0	0	1,125
2013	1,380	0	6,195	0	0	0	0	0	27,000	0	3,280
2014	1,380	0	6,380	0	0	0	0	0	39,782	0	1,375
2015	1,380	0	6,580	0	0	0	0	0	39,782	0	1,500
2016	1,380	0	6,780	0	0	0	0	0	41,582	0	1,580
2017	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2018	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2019	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2020	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2021	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2022	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2023	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2024	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2025	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2026	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2027	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2028	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2029	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2030	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2031	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2032	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2033	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2034	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
2035	1,380	0	6,980	0	0	0	0	0	41,582	0	1,660
TOTAL	46,358	2,436	285,846	5	1,651	251,189	402,027	(608,742)	1,192,652	272	83,031

(d) 1988 advance allocation.

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 14 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (cont)			SANTA ANA DIVISION							
	Reach 24			Reach 26A					Reach 28G	Reach 28H	
	MWDSC (e)	MWA	SBVMWD	CVWD(e)	DWA(e)	MWDSC (e)	SBVMWD (f)	SGVMWD	MWDSC	CVWD	DWA
[152]	[153]	[154]	[155]	[156]	[157]	[158]	[159]	[160]	[161]	[162]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	1,275	0	0	0	0
1973	0	0	0	0	0	444	32,426	18,942	0	0	0
1974	0	0	0	0	0	84,981	16,605	612	0	0	0
1975	0	0	0	0	0	169,960	13,865	5,450	0	0	0
1976	0	0	0	0	0	215,312	12,273	6,071	0	0	0
1977	0	0	0	0	0	64,823	24,833	8,996	0	0	0
1978	0	0	0	0	0	297,708	4,055	7,771	0	0	0
1979	0	0	0	0	0	260,903	18	290	0	0	0
1980	0	0	0	0	0	300,345	0	1,085	0	0	0
1981	0	0	0	0	0	395,678	16,021	3,619	0	0	0
1982	0	0	0	0	0	214,566	8,409	12,599	0	0	0
1983	0	0	0	0	0	175,288	5,994	734	0	0	0
1984	0	0	0	0	0	122,311	5,556	7,656	0	0	0
1985	0	0	0	0	0	147,599	7,390	5,028	0	0	0
1986	0	0	0	0	0	215,265	6,421	9,454	0	0	0
1987	0	0	0	0	0	175,012	18,751	10,630	0	0	0
1988	0	0	0	0	0	247,101	21,386	8,948	0	0	0
1989	0	0	0	0	0	326,217	20,782	12,839	0	0	0
1990	0	0	0	0	0	399,387	18,831	16,649	0	0	0
1991	0	2,032	0	0	0	107,182	3,661	5,399	0	0	0
1992	0	9,334	0	0	0	219,524	3,358	7,908	0	0	0
1993	0	10,000	0	23,100	38,100	98,291	4,361	14,397	0	0	0
1994	0	819	0	14,102	23,257	192,979	9,135	15,230	0	0	0
1995	0	0	0	23,100	38,100	107,299	696	12,922	0	0	0
1996	0	0	0	62,219	102,622	73,438	6,064	15,989	0	0	0
1997	0	0	0	58,100	53,100	157,215	9,654	18,175	0	0	0
1998	0	0	0	78,100	58,100	36,770	1,878	9,310	6,582	7,708	0
1999	0	0	0	50,480	58,100	139,752	12,874	21,729	0	0	0
2000	0	0	0	42,323	58,234	326,647	0	15,140	0	0	0
2001	0	0	0	9,100	15,010	284,007	0	2,360	0	0	0
2002	0	0	0	16,755	27,640	301,700	26,399	24,851	0	0	0
2003	17,249	0	0	14,443	23,819	464,719	5,000	21,934	0	0	0
2004	0	0	0	15,465	21,190	428,316	40,000	12,541	0	0	0
2005	14,058	341	0	34,356	49,089	361,976	15,834	13,984	0	0	0
2006	0	0	0	121,100	50,000	404,594	20,000	16,284	0	0	0
2007	0	17,249	710	66,007	27,253	370,971	10,022	4,024	0	7,221	2,981
2008	0	3,679	411	40,171	24,643	210,520	187	7,212	0	6,620	1,785
2009	0	7,488	149	45,074	17,872	138,216	0	11,520	0	948	391
2010	0	9,331	26	53,866	18,398	463,654	20,008	19,180	0	30,415	12,257
2011	14,141	0	31	84,566	34,076	610,454	368	23,591	0	5,713	2,303
2012	0	0	260	84,676	52,064	499,176	0	17,280	0	0	142
2013	0	4,620	260	83,010	33,450	465,085	0	12,000	0	0	0
2014	0	8,400	260	83,010	33,450	465,085	0	17,280	0	0	0
2015	0	8,400	260	83,010	33,450	465,085	0	12,000	0	0	0
2016	0	9,000	260	83,010	33,450	465,085	0	12,000	0	0	0
2017	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2018	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2019	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2020	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2021	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2022	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2023	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2024	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2025	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2026	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2027	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2028	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2029	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2030	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2031	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2032	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2033	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2034	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
2035	0	9,000	260	83,010	33,450	465,085	0	16,000	0	0	0
TOTAL	45,448	261,693	7,567	2,846,333	1,560,017	20,507,255	424,390	786,671	18,942	57,499	27,567

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

(f) Includes 1,650 AF recaptured from ground water storage in 1982, 10,000 AF in 1987, and 8,749 AF in 1988. This was water stored under DWR's Ground Water Demonstration Program.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 15 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)									
	Reach 28H	Reach 28J			Reach EBX1			Reach EBX2C	Reach EBX3A	
	MWDSC	CVWD	DWA	MWDSC	CVWD	MWDSC	SBVMWD	SBVMWD	SBVMWD	
[163]	[164]	[165]	[166]	[167]	[168]	[169]	[170]	[171]		
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	251	0	0	0	0	0	0
1976	55	0	0	2,000	0	0	0	0	0	0
1977	43	0	0	2,442	0	0	0	0	0	0
1978	48	0	0	64,054	0	0	0	0	0	0
1979	1,290	0	0	94,353	0	0	0	0	0	0
1980	3,013	0	0	91,532	0	0	0	0	0	0
1981	4,365	0	0	149,405	0	0	0	0	0	0
1982	3,961	0	0	155,629	0	0	0	0	0	0
1983	6,645	0	0	41,616	0	0	0	0	0	0
1984	109,743	0	0	5,672	0	0	0	0	0	0
1985	182,781	0	0	6,538	0	0	0	0	0	0
1986	131,439	0	0	30,071	0	0	0	0	0	0
1987	144,743	0	0	26,315	0	0	0	0	0	0
1988	199,641	0	0	22,209	0	0	0	0	0	0
1989	247,430	0	0	51,462	0	0	0	0	0	0
1990	257,796	0	0	36,060	0	0	0	0	0	0
1991	38,832	0	0	5,958	0	0	0	0	0	0
1992	85,341	0	0	12,223	0	0	0	0	0	0
1993	61,841	0	0	4,588	0	0	0	0	0	0
1994	134,262	0	0	4,725	0	0	0	0	0	0
1995	117,762	0	0	21,099	0	0	0	0	0	0
1996	144,906	0	0	12,418	0	0	0	0	0	0
1997	107,853	0	0	47,777	0	0	0	0	0	0
1998	77,473	1,027	4,839	50,411	0	0	0	0	0	0
1999	206,689	0	0	8,163	0	0	0	0	0	0
2000	379,713	0	0	7,864	0	5,466	18,399	0	0	0
2001	260,984	0	0	33,414	0	0	26,488	0	0	0
2002	340,635	0	0	41,552	0	1,427	37,069	0	0	0
2003	246,485	0	0	50,776	0	74,496	16,703	1,793	2,617	0
2004	357,995	0	0	20,437	0	120,338	13,229	1,430	2,371	0
2005	242,245	0	0	114,499	8,163	153,700	12,715	966	2,035	0
2006	342,734	0	0	32,242	0	147,432	11,832	885	2,614	0
2007	271,874	0	0	48,923	0	94,208	38,151	3,130	5,103	0
2008	175,460	0	0	10,432	0	16,745	25,038	688	8,823	0
2009	126,265	0	0	5,849	0	18,314	25,041	4,090	10,066	0
2010	129,145	1,311	528	65,439	0	0	19,190	617	9,538	0
2011	213,215	0	0	51,638	0	0	19,578	699	9,384	0
2012	72,005	0	0	133,333	0	0	71,300	0	0	0
2013	69,282	0	0	58,345	0	0	61,300	0	0	0
2014	69,282	0	0	58,345	0	0	61,300	0	0	0
2015	69,282	0	0	58,345	0	0	61,300	0	0	0
2016	69,282	0	0	58,345	0	0	61,300	0	0	0
2017	69,282	0	0	58,345	0	0	61,300	0	0	0
2018	69,282	0	0	58,345	0	0	61,300	0	0	0
2019	69,282	0	0	58,345	0	0	61,300	0	0	0
2020	69,282	0	0	58,345	0	0	61,300	0	0	0
2021	69,282	0	0	58,345	0	0	61,300	0	0	0
2022	69,282	0	0	58,345	0	0	61,300	0	0	0
2023	69,282	0	0	58,345	0	0	61,300	0	0	0
2024	69,282	0	0	58,345	0	0	61,300	0	0	0
2025	69,282	0	0	58,345	0	0	61,300	0	0	0
2026	69,282	0	0	58,345	0	0	61,300	0	0	0
2027	69,282	0	0	58,345	0	0	61,300	0	0	0
2028	69,282	0	0	58,345	0	0	61,300	0	0	0
2029	69,282	0	0	58,345	0	0	61,300	0	0	0
2030	69,282	0	0	58,345	0	0	61,300	0	0	0
2031	69,282	0	0	58,345	0	0	61,300	0	0	0
2032	69,282	0	0	58,345	0	0	61,300	0	0	0
2033	69,282	0	0	58,345	0	0	61,300	0	0	0
2034	69,282	0	0	58,345	0	0	61,300	0	0	0
2035	69,282	0	0	58,345	0	0	61,300	0	0	0
TOTAL	7,020,193	2,338	5,367	2,905,304	8,163	632,126	1,744,633	14,296	52,551	0

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 16 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)		WEST BRANCH							
	Reach EBX4B-G	Reach EBX4B	Reach 29F	Reach 29H		Reach 30				
	SGPWD	SGPWD	AVEKWA	CLWA	VCFCFCD	CLWA	CVWD	DWA	MWDSC (g)	SBVMWD
[172]	[173]	[174]	[175]	[176]	[177]	[178]	[179]	[180]	[181]	
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	53	0	0	0	0	0	71,938	0
1973	0	0	20	0	0	0	0	0	155,297	0
1974	0	0	36	0	0	0	0	0	209,136	0
1975	0	0	26	0	0	0	0	0	374,280	0
1976	0	0	24	0	0	0	0	0	420,684	0
1977	0	0	0	0	0	0	0	0	122,447	0
1978	0	0	0	0	0	0	0	0	171,139	0
1979	0	0	0	0	0	0	7	0	145,591	0
1980	0	0	0	0	0	1,210	0	0	164,721	0
1981	0	0	0	0	0	5,761	0	0	277,503	0
1982	0	0	0	0	0	9,516	0	0	351,362	0
1983	0	0	0	0	0	9,476	0	0	157,519	0
1984	0	0	0	0	0	11,477	0	0	260,624	0
1985	0	0	0	0	0	12,401	0	0	390,696	0
1986	0	0	0	0	0	13,928	0	0	379,275	0
1987	0	0	0	0	0	16,167	0	0	417,285	0
1988	0	0	0	0	0	18,904	0	0	488,265	0
1989	0	0	0	0	0	21,719	0	0	589,962	0
1990	0	0	0	0	4,836	22,139	0	0	764,380	0
1991	0	0	0	0	988	3,846	0	0	257,835	0
1992	0	0	0	0	0	14,812	0	0	420,849	0
1993	0	0	6	0	0	13,787	0	0	437,470	0
1994	0	0	0	0	0	14,919	0	0	475,900	0
1995	0	0	0	0	0	17,747	0	0	139,882	0
1996	0	0	0	0	0	18,448	0	0	267,618	0
1997	0	0	11	0	0	22,842	10,240	16,890	271,379	0
1998	0	0	7	0	0	19,782	0	0	187,277	0
1999	0	0	0	0	0	28,813	0	0	327,001	0
2000	0	0	0	0	2,200	31,085	0	0	632,991	0
2001	0	0	0	0	0	30,701	0	0	444,764	0
2002	0	0	0	0	0	3,148	42,080	0	723,605	8,601
2003	0	116	0	6,768	0	3,150	44,967	0	678,964	0
2004	0	841	0	0	0	4,047	47,463	0	797,294	0
2005	0	692	0	0	0	0	36,747	0	538,839	0
2006	3,471	807	0	0	0	40,017	0	0	574,679	0
2007	3,758	177	0	0	0	1,890	45,919	0	711,831	0
2008	3,863	1,042	0	0	0	1,990	42,878	0	485,156	0
2009	4,499	1,898	0	0	0	3,150	38,784	0	589,294	0
2010	2,555	5,685	0	0	0	3,150	31,288	0	376,877	0
2011	1,213	9,290	0	0	2,520	31,445	0	0	375,921	0
2012	0	11,000	0	0	1,890	36,400	0	0	502,386	0
2013	2,760	7,620	0	0	1,890	37,200	0	0	516,188	0
2014	0	8,340	0	0	1,890	37,000	0	0	376,188	0
2015	0	8,960	0	0	1,890	39,200	0	0	376,188	0
2016	0	9,580	0	0	1,890	39,400	0	0	376,188	0
2017	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2018	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2019	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2020	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2021	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2022	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2023	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2024	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2025	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2026	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2027	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2028	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2029	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2030	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2031	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2032	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2033	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2034	0	9,100	0	0	1,890	39,700	0	0	376,188	0
2035	0	9,100	0	0	1,890	39,700	0	0	376,188	0
TOTAL	22,119	238,948	183	6,768	76,419	1,704,575	10,240	16,890	24,922,240	8,601

(g) Deliveries exclude 6,171 AF of 1982 exchange water.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor

(in acre-feet)

Sheet 17 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									TOTAL	GRAND TOTAL
	WEST BRANCH (continued)			COASTAL BRANCH							
	Reach 30		Reach 31A				Reach 33A				
	SBC FC&WCD	VCFC	CLWA	DRWD	KCWA		CK	SLOC FC&WCD	SBC FC&WCD		
(M&I)					(AG)						
	[182]	[183]	[184]	[185]	[186]	[187]	[188]	[189]	[190]	[191]	[192]
1962	0	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	7,382	0	0	71,657	0	0	0	192,188	294,457
1969	0	0	9,970	0	0	52,094	0	0	0	195,705	268,104
1970	0	0	11,739	0	0	71,910	0	0	0	276,211	369,459
1971	0	0	12,490	0	0	98,481	0	0	0	553,081	654,442
1972	0	0	13,905	0	0	107,850	0	0	0	895,006	1,037,770
1973	0	0	9,418	0	0	69,227	0	0	0	638,930	737,532
1974	0	0	9,700	0	0	68,474	0	0	0	783,984	878,947
1975	0	0	10,700	0	0	74,516	0	0	0	1,129,728	1,230,830
1976	0	0	11,700	0	0	78,358	0	0	0	1,245,662	1,380,124
1977	0	0	5,075	0	0	35,504	0	0	0	465,442	582,381
1978	0	0	11,362	0	0	81,242	0	0	0	1,338,268	1,458,733
1979	0	0	19,138	0	0	104,017	0	0	0	1,537,075	1,666,457
1980	0	0	13,882	0	0	97,497	0	0	0	1,413,363	1,536,456
1981	0	0	12,700	0	0	97,054	0	0	0	1,779,479	1,918,563
1982	0	0	12,700	0	0	83,076	0	0	0	1,641,571	1,750,862
1983	0	0	12,659	0	0	87,859	0	0	0	1,089,626	1,187,156
1984	0	0	12,741	0	0	119,098	0	0	0	1,489,814	1,591,416
1985	0	0	12,099	0	0	110,124	0	0	0	1,863,544	1,990,295
1986	0	0	13,301	0	0	118,298	0	0	0	1,882,290	1,999,155
1987	0	0	11,821	0	0	116,259	0	0	0	1,984,570	2,131,608
1988	0	0	11,534	0	0	109,435	0	0	0	2,221,538	2,358,122
1989	0	0	14,645	0	0	102,156	0	0	0	2,686,838	2,853,747
1990	0	0	6,440	0	0	103,362	0	0	0	2,398,121	2,582,151
1991	1,240	0	716	0	0	780	0	0	0	489,489	549,113
1992	0	0	5,887	0	0	73,748	0	0	0	1,374,775	1,471,454
1993	0	0	4,157	0	0	30,764	0	0	0	2,175,352	2,316,235
1994	0	0	9,422	0	200	77,536	0	0	0	1,727,504	1,861,976
1995	0	0	9,486	0	0	85,050	0	0	0	1,926,835	2,031,423
1996	0	0	14,052	0	0	100,578	0	0	0	2,429,928	2,543,472
1997	0	1,850	4,870	0	0	97,020	0	1,099	7,439	2,263,966	2,405,444
1998	0	1,850	311	0	0	86,879	0	3,592	18,618	1,657,381	1,764,963
1999	0	1,850	4,086	0	0	92,095	0	3,743	20,137	2,755,025	2,898,961
2000	0	1,850	8,395	0	0	85,215	0	3,962	22,741	3,390,079	3,569,072
2001	0	1,850	1,238	0	0	63,448	0	4,283	18,946	2,034,350	2,175,194
2002	0	1,850	2,737	0	0	65,055	0	4,355	27,636	2,738,943	2,909,555
2003	0	1,850	4,001	0	0	65,691	0	4,453	26,968	3,151,625	3,327,811
2004	0	1,203	3,776	0	0	66,498	0	4,165	29,705	3,050,652	3,230,590
2005	0	1,665	2,709	4,684	0	68,190	0	4,251	23,344	3,597,829	3,752,507
2006	0	1,850	2,735	0	0	85,214	0	4,209	23,275	3,526,551	3,693,938
2007	0	1,110	6,071	0	0	93,954	49	3,776	27,740	3,088,763	3,284,475
2008	0	1,818	0	0	17,059	68,385	0	3,402	18,393	1,995,796	2,169,587
2009	0	741	1	0	0	83,255	0	3,801	15,452	2,059,805	2,221,501
2010	0	925	768	2,967	0	81,047	276	3,757	17,775	2,690,242	2,832,658
2011	0	1,480	2,188	0	0	86,794	238	3,819	21,050	3,507,793	3,663,541
2012	0	7,110	4,000	0	0	64,510	238	4,035	41,027	2,498,610	2,706,402
2013	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,311,045	2,491,404
2014	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,316,450	2,497,862
2015	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,306,045	2,494,519
2016	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,295,045	2,482,616
2017	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2018	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2019	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2020	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2021	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2022	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2023	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2024	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2025	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2026	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2027	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2028	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2029	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2030	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2031	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2032	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2033	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2034	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
2035	0	7,110	4,000	0	0	55,260	183	3,623	27,292	2,310,045	2,500,680
TOTAL	1,240	194,382	450,707	7,651	17,259	5,010,234	5,010	152,781	987,962	136,951,767	147,532,124

Tables B-5A-Adj through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor

Calendar Year	CALIFORNIA AQUEDUCT												
	SAN LUIS DIVISION												
	Reach 1	Reach 3A											
	SCVWD	AVEK	CLWA	CLAWA	DRWD	KCWA (AG)	MWDSC	MWA	PWD	SBVMWD	SGVMWD	SGPWD	SLOC FC&WCD
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	(11,135)	0	0	0	0	0	0	0
2001	0	0	0	0	0	(11,487)	0	0	0	0	0	0	0
2002	0	0	0	0	0	(9,332)	0	0	0	0	0	0	0
2003	0	0	0	0	0	(18,428)	0	0	0	0	0	0	0
2004	0	0	0	0	0	(866)	0	0	0	0	0	0	0
2005	0	0	0	0	(576)	(20,082)	0	0	0	0	0	0	0
2006	0	0	0	0	0	(20,239)	0	0	0	0	0	0	0
2007	0	0	0	0	0	(9,867)	0	0	0	0	0	0	0
2008	(8,885)	0	0	0	0	(99,439)	0	0	0	0	0	0	0
2009	0	(5,926)	(38)	(1)	(28)	(82,636)	(815)	(5)	(15)	(21)	(4)	(4)	(2)
2010	0	0	(3,300)	0	0	(87,370)	(177,476)	0	0	0	0	0	0
2011	0	0	0	0	0	(57,029)	(106,423)	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(8,885)	(5,926)	(3,338)	(1)	(604)	(427,910)	(284,714)	(5)	(15)	(21)	(4)	(4)	(2)

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)						SOUTH SAN JOAQUIN DIVISION					
	Reach 3A				Reach 4		Reach 7		Reach 10A			
	SBC		TLBWS		KCWA		KCWA		AC		DWA	
FC&WCD	SCVWD	TLBWS	VCFC	(AG)	TLBWS	(AG)	TLBWS	FC&WCD	ACWD	CLWA	DWA	
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	0	0	0	0	0	0	
1973	0	0	0	0	0	0	0	0	0	0	0	
1974	0	0	0	0	0	0	0	0	0	0	0	
1975	0	0	0	0	0	0	0	0	0	0	0	
1976	0	0	0	0	0	0	0	0	0	0	0	
1977	0	0	0	0	0	0	0	0	0	0	0	
1978	0	0	0	0	0	0	0	0	0	0	0	
1979	0	0	0	0	0	0	0	0	0	0	0	
1980	0	0	0	0	0	0	0	0	0	0	0	
1981	0	0	0	0	0	0	0	0	0	0	0	
1982	0	0	0	0	0	0	0	0	0	0	0	
1983	0	0	0	0	0	0	0	0	0	0	0	
1984	0	0	0	0	0	0	0	0	0	0	0	
1985	0	0	0	0	0	0	0	0	0	0	0	
1986	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	0	
1988	0	0	0	0	0	0	0	0	0	0	0	
1989	0	0	0	0	0	0	0	0	0	0	0	
1990	0	0	0	0	0	0	0	0	0	0	0	
1991	0	0	0	0	0	0	0	0	0	0	0	
1992	0	0	0	0	0	0	0	0	0	0	0	
1993	0	0	0	0	0	0	0	0	0	0	0	
1994	0	0	0	0	0	0	0	0	0	0	0	
1995	0	0	0	0	0	0	0	0	0	0	0	
1996	0	0	0	0	0	0	0	0	0	0	0	
1997	0	0	0	0	0	0	0	0	0	0	0	
1998	0	0	0	0	0	0	0	0	0	0	0	
1999	0	0	0	0	0	0	0	0	0	0	0	
2000	0	0	0	0	(12,806)	0	(24,167)	(2,981)	0	0	0	
2001	0	0	0	0	0	0	0	(25,164)	(1,807)	0	0	
2002	0	0	0	0	0	0	0	0	0	0	0	
2003	0	0	0	0	0	0	0	0	0	0	0	
2004	0	0	(4,000)	0	0	(6,020)	0	0	0	0	0	
2005	0	(20,000)	(277)	0	0	0	0	0	0	0	0	
2006	0	(53,573)	0	0	0	0	0	0	0	0	0	
2007	0	0	0	0	0	0	0	0	(5,000)	0	0	
2008	0	(3,681)	0	0	0	0	0	0	(7,000)	(10,000)	(4,864)	
2009	(19)	(1,000)	(49)	(1)	0	0	0	0	0	(3,083)	(4,950)	
2010	0	(44,668)	(17,551)	0	0	0	0	0	0	0	0	
2011	0	(49,579)	(11,096)	0	0	0	0	0	0	0	0	
2012	0	0	0	0	0	0	0	0	0	0	0	
2013	0	0	0	0	0	0	0	0	0	0	0	
2014	0	0	0	0	0	0	0	0	0	0	0	
2015	0	0	0	0	0	0	0	0	0	0	0	
2016	0	0	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	(19)	(172,501)	(32,973)	(1)	(12,806)	(6,020)	(24,167)	(28,145)	(8,807)	(18,083)	(4,950)	(4,864)

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 10A			Reach 12E						Reach 13B		
	KCWA	MWDSC	SCVWD	AVEK	CLWA	CVWD	DWA	KCWA	MWDSC	SCVWD	KCWA	MWDSC
(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	(AG)	
[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[37]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0
2001	(1,813)	(31,500)	(30,000)	0	0	0	0	0	(20,800)	0	(132,228)	0
2002	0	0	0	0	0	0	0	(14,638)	0	0	(22,161)	0
2003	0	(10,000)	0	0	0	0	0	(5,170)	(5,073)	0	(15,316)	(24,523)
2004	(3)	(93,555)	0	0	0	0	0	0	(17,765)	0	(43,985)	(4,813)
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0
2007	(12,469)	(93,986)	(20,000)	0	(11,000)	0	0	(16,618)	(5,000)	0	(257,750)	0
2008	0	(99,024)	(10,000)	(8,393)	(11,000)	(3,000)	(3,486)	(114,331)	(8,402)	0	(228,579)	(25,721)
2009	(7,733)	(65,499)	(27,319)	(6,393)	(11,000)	(3,000)	0	(105,145)	(14,516)	(6,134)	(186,044)	0
2010	(56)	0	0	0	(2,750)	(8,393)	0	(43,833)	(52,413)	0	(59,451)	0
2011	0	0	0	0	0	0	0	(14,952)	(21,471)	0	(29,041)	0
2012	0	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(22,074)	(393,564)	(87,319)	(14,786)	(35,750)	(14,393)	(3,486)	(314,687)	(145,440)	(6,134)	(974,555)	(55,057)

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor

Calendar Year	CALIFORNIA AQUEDUCT (continued)										GRAND TOTAL
	SOUTH SAN JOAQUIN DIVISION (continued)					MOJAVE DIVISION			SANTA ANA DIVISION		
	Reach 13B	Reach 14B	Reach 14C		Reach 15A	Reach 16A	Reach 22B		Reach 24	Reach EBX2C	
	PWD	KCWA	KCWA	MWDSC	KCWA	KCWA	AVEK	MWDSC	MWD	SBVMWD	
[36]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	(51,089)
2001	0	(396)	(242)	0	0	0	(152)	0	0	0	(255,589)
2002	0	0	0	0	0	0	0	0	0	0	(46,131)
2003	0	0	0	(12,380)	0	0	0	0	0	0	(90,890)
2004	0	0	0	(25,512)	0	0	0	0	0	(844)	(197,363)
2005	0	0	0	0	0	0	0	0	0	(7)	(40,942)
2006	0	0	0	0	0	0	0	0	0	(2)	(73,814)
2007	(4,926)	0	0	(24,225)	0	0	0	(8,751)	(17,249)	0	(486,841)
2008	0	0	0	(37,602)	0	0	0	(4,816)	(3,679)	(6)	(691,908)
2009	0	(1,706)	(5,168)	(54,948)	(2,788)	(444)	0	0	(7,488)	(11)	(603,933)
2010	0	(1,867)	(4,761)	(32,758)	(2,913)	0	0	0	(2,891)	0	(542,451)
2011	0	0	0	(16,065)	0	0	0	0	0	0	(305,656)
2012	0	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(4,926)	(3,969)	(10,171)	(203,490)	(5,701)	(444)	(152)	(13,567)	(31,307)	(870)	(3,386,607)

TABLE B-5B Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (b)				CENTRAL COASTAL AREA		
	Napa (a) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	494	8,412	0	8,906	0	0	0
1963	0	0	0	1,731	10,914	0	12,645	0	0	0
1964	0	0	0	1,673	19,238	0	20,911	0	0	0
1965	0	0	0	2,605	16,407	15,014	34,026	0	0	0
1966	0	0	0	5,511	14,864	34,538	54,913	0	0	0
1967	0	0	0	4,780	12,882	39,101	56,763	0	0	0
1968	1,214	0	1,214	6,133	24,817	70,105	101,055	0	0	0
1969	2,687	0	2,687	6,635	813	62,264	69,712	0	0	0
1970	3,618	0	3,618	9,249	0	80,311	89,560	0	0	0
1971	2,521	0	2,521	5,017	5,961	87,606	98,584	0	0	0
1972	3,647	0	3,647	10,489	27,671	100,266	138,426	0	0	0
1973	3,792	0	3,792	2,975	2,521	88,582	94,078	0	0	0
1974	4,870	0	4,870	1,314	4	88,000	89,318	0	0	0
1975	6,840	0	6,840	4,618	986	88,000	93,604	0	0	0
1976	7,122	0	7,122	17,131	21,300	88,000	126,431	0	0	0
1977	8,226	0	8,226	12,644	18,840	76,220	107,704	0	0	0
1978	6,034	0	6,034	10,984	5,863	95,727	112,574	0	0	0
1979	6,561	0	6,561	19,325	10,874	91,991	122,190	0	0	0
1980	6,707	0	6,707	16,790	11,034	88,000	115,824	0	0	0
1981	9,001	0	9,001	19,590	21,917	88,000	129,507	0	0	0
1982	1,213	0	1,213	13,123	6,316	88,000	107,439	0	0	0
1983	2,287	0	2,287	4,766	3,157	86,733	94,656	0	0	0
1984	2,923	0	2,923	6,784	3,338	88,000	98,122	0	0	0
1985	4,039	0	4,039	15,072	19,016	88,000	122,088	0	0	0
1986	3,519	1,400	4,919	10,609	12,379	88,000	110,988	0	0	0
1987	7,693	1,550	9,243	23,406	25,390	88,000	136,796	0	0	0
1988	5,392	9,726	15,118	25,830	33,464	87,961	147,255	0	0	0
1989	6,195	17,256	23,451	26,227	26,042	90,000	142,269	0	0	0
1990	6,940	19,131	26,071	33,034	31,703	92,000	156,737	0	0	0
1991	1,380	6,972	8,352	9,411	12,648	28,200	50,259	0	1,240	1,240
1992	4,001	14,773	18,774	14,669	19,153	42,839	76,661	0	0	0
1993	5,286	29,180	34,466	33,635	10,271	62,065	105,971	0	0	0
1994	6,792	25,256	32,048	20,542	22,911	57,115	100,568	0	0	0
1995	5,182	21,345	26,527	30,091	17,793	28,756	76,640	0	0	0
1996	4,893	29,999	34,892	18,903	19,662	89,850	128,415	100	0	100
1997	4,341	33,530	37,871	27,522	24,063	95,601	147,186	1,199	7,439	8,638
1998	5,359	29,766	35,125	17,941	19,075	63,410	100,426	3,592	18,618	22,210
1999	5,304	34,753	40,057	50,910	37,652	82,945	171,507	3,743	20,137	23,880
2000	4,958	37,015	41,973	58,617	35,978	101,988	196,583	3,962	22,741	26,703
2001	9,345	34,586	43,931	34,409	18,004	77,922	130,335	4,283	18,946	23,229
2002	6,875	38,560	45,435	53,261	27,811	62,186	143,258	4,355	27,636	31,991
2003	7,646	33,951	41,597	45,450	36,590	108,981	191,021	4,453	26,968	31,421
2004	8,134	43,002	51,136	52,364	27,884	59,458	139,706	4,165	29,705	33,870
2005	7,669	37,819	45,488	47,512	44,599	128,249	220,360	4,251	23,344	27,595
2006	7,789	35,516	43,305	54,527	43,079	128,210	225,816	4,209	23,275	27,484
2007	10,957	47,300	58,257	40,157	24,391	75,382	139,930	3,776	27,740	31,516
2008	13,292	41,320	54,612	41,186	22,902	59,160	123,248	3,402	18,393	21,795
2009	10,904	30,950	41,854	31,087	19,496	76,363	126,946	3,801	15,452	19,253
2010	12,417	30,816	43,233	47,343	22,571	107,871	177,785	3,757	17,775	21,532
2011	11,314	27,995	39,309	52,726	36,610	131,237	220,573	3,819	23,598	27,417
2012	19,046	48,309	67,355	60,671	28,044	111,500	200,215	4,035	41,027	45,062
2013	17,415	28,564	45,979	50,371	25,200	72,000	147,571	12,373	27,292	39,665
2014	17,415	29,564	46,979	50,371	25,200	72,000	147,571	12,373	27,292	39,665
2015	17,415	29,564	46,979	50,371	25,200	72,000	147,571	12,373	27,292	39,665
2016	17,415	28,564	45,979	50,371	25,200	72,000	147,571	12,373	27,292	39,665
2017	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2018	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2019	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2020	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2021	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2022	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2023	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2024	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2025	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2026	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2027	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2028	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2029	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2030	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2031	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2032	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2033	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2034	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
2035	17,415	28,564	45,979	53,371	25,200	72,000	150,571	12,373	27,292	39,665
TOTAL	686,470	1,420,748	2,107,218	2,377,006	1,546,910	5,513,707	9,437,623	345,481	991,750	1,337,231

(a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.
 (b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

TABLE B-5B Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	26,360	1,978	0	127,384	127,384	900	3,084	25,100	184,806
1969	31,375	56	0	141,265	141,265	100	3,016	9,923	185,735
1970	40,407	3,942	0	204,634	204,634	0	5,911	9,578	264,472
1971	41,053	5,990	0	360,151	360,151	3,700	7,212	122,485	540,591
1972	42,443	5,795	0	490,781	490,781	1,400	8,166	258,393	806,978
1973	22,057	3,000	0	341,469	341,469	1,500	3,214	50,464	421,704
1974	33,390	3,000	23,708	323,292	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	14,529	396,291	410,820	1,600	3,576	86,258	545,809
1976	41,421	3,000	46,719	392,531	439,250	1,600	4,112	58,811	548,194
1977	11,153	738	27,882	163,425	191,307	1,530	1,472	18,081	224,281
1978	51,747	454	76,895	590,452	667,347	2,070	3,906	12,053	737,577
1979	38,544	1,739	62,997	683,049	746,046	2,000	6,149	155,121	949,599
1980	41,000	894	45,943	588,557	634,500	2,200	5,700	75,444	759,738
1981	41,000	5,859	75,758	615,642	691,400	2,300	4,300	83,438	828,297
1982	41,000	361	47,477	697,823	745,300	1,750	3,838	18,551	810,800
1983	42,900	0	6,854	587,653	594,507	3,550	3,822	1,006	645,785
1984	45,100	0	90,904	769,696	860,600	3,100	5,700	5,743	920,243
1985	46,251	5,197	88,515	800,381	888,896	3,400	5,433	109,791	1,058,968
1986	50,249	1,170	77,240	829,101	906,341	3,700	5,107	79,355	1,045,922
1987	46,288	2,525	117,174	852,731	969,905	4,000	5,625	93,084	1,121,427
1988	47,994	3,475	122,409	887,111	1,009,520	4,000	4,412	95,866	1,165,267
1989	57,049	3,000	123,896	1,022,166	1,148,062	4,000	6,091	127,950	1,344,152
1990	36,296	1,279	127,837	584,611	712,448	2,000	2,922	57,070	812,015
1991	927	221	33,122	8,965	42,087	0	141	2,180	45,556
1992	23,770	1,354	62,326	420,894	483,220	1,806	2,239	46,728	559,117
1993	50,618	2,741	128,316	1,039,614	1,167,930	4,000	4,858	124,468	1,354,615
1994	28,793	1,666	87,139	570,020	657,159	2,116	3,071	62,362	755,167
1995	60,686	1,631	135,415	1,016,114	1,151,529	4,000	5,169	101,869	1,324,884
1996	56,948	1,868	135,654	1,049,409	1,185,063	4,000	4,904	236,875	1,489,658
1997	71,308	0	120,708	987,451	1,108,159	0	5,238	22,369	1,207,074
1998	55,650	542	89,765	768,825	858,590	15	4,401	20,677	939,875
1999	59,697	3,176	138,153	1,039,985	1,178,138	4,000	4,871	289,735	1,539,617
2000	60,539	1,799	40,697	1,183,440	1,224,137	3,600	4,508	201,294	1,495,877
2001	41,902	1,360	3,116	651,175	654,291	1,560	3,592	84,726	787,431
2002	48,915	1,405	12,589	812,870	825,459	2,854	4,885	96,502	986,020
2003	46,082	1,436	47,070	917,160	964,230	3,692	4,266	105,841	1,125,547
2004	49,080	3,562	126,933	712,193	839,126	9,053	4,629	90,021	995,471
2005	79,005	3,834	69,594	1,328,387	1,397,981	19,806	4,194	140,279	1,645,099
2006	72,080	3,282	98,199	1,164,671	1,262,870	9,530	4,242	108,207	1,460,211
2007	45,135	2,084	79,144	949,601	1,028,745	5,746	3,567	87,083	1,172,360
2008	22,174	947	24,572	719,467	744,039	3,836	1,985	33,904	806,885
2009	21,237	1,034	2,912	773,763	776,675	3,391	1,993	36,836	841,166
2010	27,967	3,259	8,183	689,917	698,100	4,679	2,906	70,238	807,149
2011	59,560	1,915	37,112	1,160,672	1,197,784	6,556	2,715	63,141	1,331,671
2012	35,070	3,400	76,710	583,048	659,758	7,296	4,784	86,768	797,076
2013	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2014	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2015	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2016	30,206	1,800	77,710	500,928	578,638	5,583	3,420	53,353	673,000
2017	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2018	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2019	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2020	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2021	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2022	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2023	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2024	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2025	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2026	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2027	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2028	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2029	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2030	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2031	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2032	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2033	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2034	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
2035	30,206	1,800	77,710	511,928	589,638	5,583	3,420	53,353	684,000
TOTAL	2,627,513	140,368	4,521,496	42,761,181	47,282,677	281,845	268,057	4,965,076	55,565,536

TABLE B-5B Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (c)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	7,382	0	0	0	0	0	0	0	0
1969	0	9,970	0	0	0	0	0	0	0	0
1970	0	11,739	0	0	0	0	0	0	0	0
1971	0	12,490	0	0	0	0	0	0	0	0
1972	53	13,905	0	464	0	338	55	0	1,275	0
1973	20	9,418	5,800	389	9,000	290	0	0	32,426	0
1974	1,259	9,700	6,400	627	10,000	400	14	0	16,605	612
1975	8,068	10,700	7,000	825	11,000	520	0	0	13,865	5,450
1976	27,782	11,700	7,600	1,002	12,000	589	0	0	12,273	6,071
1977	11,202	5,075	0	1,109	0	111	80	0	24,833	8,996
1978	44,137	11,362	10,084	1,209	15,300	208	0	0	4,055	7,771
1979	60,493	19,145	10,063	1,260	15,000	133	4,000	0	18	290
1980	72,407	15,092	10,884	1,239	17,000	191	4,000	0	0	1,085
1981	79,375	18,461	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619
1982	50,291	22,216	13,326	1,238	21,000	0	10,500	0	8,409	12,599
1983	32,961	22,135	14,547	911	23,000	38	0	0	5,994	734
1984	32,662	24,218	15,768	1,128	25,000	1	0	0	5,556	7,656
1985	37,064	24,500	16,989	1,422	27,000	0	0	1,558	7,390	5,028
1986	32,449	27,229	18,210	1,506	29,000	163	0	3,096	6,421	9,454
1987	34,089	27,988	19,431	1,849	31,500	1,085	17	5,379	18,751	10,630
1988	34,079	30,438	20,652	2,006	34,000	419	9	1,770	21,386	8,948
1989	45,280	36,364	21,873	2,170	36,500	971	200	9,009	20,782	12,839
1990	47,206	28,579	23,100	1,827	38,100	1,747	0	8,608	18,831	16,649
1991	9,568	4,562	6,930	849	11,430	522	3,423	3,914	3,661	5,399
1992	30,265	20,699	10,427	519	17,197	251	10,686	4,035	3,358	7,908
1993	43,102	23,039	23,100	439	38,100	734	11,514	7,761	4,361	14,397
1994	49,153	26,441	14,102	785	23,257	1,098	16,852	8,418	9,135	15,230
1995	47,286	27,233	23,100	409	38,100	480	8,722	6,961	696	12,922
1996	56,356	32,500	62,219	485	102,622	494	7,427	11,434	6,064	15,989
1997	62,393	27,712	68,340	651	69,990	444	10,374	11,861	9,654	18,175
1998	52,926	20,093	85,709	187	70,647	404	3,925	8,752	1,878	9,310
1999	69,073	32,899	50,480	1,132	58,100	342	8,144	13,278	12,874	21,729
2000	83,577	40,680	42,323	1,194	58,234	0	11,380	9,060	18,399	15,140
2001	62,857	31,939	9,100	1,057	15,010	0	4,433	10,427	26,488	2,360
2002	58,171	68,817	16,755	2,189	27,640	0	4,346	18,496	72,069	24,851
2003	60,029	55,736	14,443	1,563	23,819	0	14,435	11,547	26,113	21,934
2004	59,731	83,761	15,465	2,006	21,190	0	13,176	12,162	57,030	12,541
2005	59,831	59,456	42,519	807	49,089	0	13,561	11,712	31,550	13,984
2006	80,384	62,752	121,100	641	50,000	0	34,014	12,492	35,331	16,284
2007	80,203	60,190	73,228	1,768	30,234	0	48,109	19,634	57,116	4,024
2008	54,436	42,878	46,791	848	26,428	25	25,396	14,255	35,145	7,212
2009	45,670	42,085	46,022	894	18,263	42	29,047	15,339	39,346	11,520
2010	58,489	57,900	85,592	357	31,183	0	38,152	10,969	49,379	19,180
2011	94,046	39,241	90,279	185	36,379	0	5,099	14,333	38,126	23,591
2012	57,780	57,120	84,676	1,125	52,206	1,380	0	15,443	71,560	17,280
2013	84,840	57,120	83,010	3,280	33,450	1,380	49,680	12,780	61,560	12,000
2014	84,840	57,120	83,010	3,405	33,450	1,380	49,680	12,780	61,560	17,280
2015	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	12,000
2016	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	12,000
2017	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2018	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2019	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2020	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2021	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2022	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2023	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2024	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2025	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2026	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2027	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2028	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2029	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2030	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2031	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2032	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2033	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2034	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
2035	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	16,000
TOTAL	3,877,523	2,641,299	3,175,762	123,521	2,011,868	46,430	1,523,530	575,643	2,260,104	786,671

(c) Devil's Den Water District merged with Castaic Lake Water Agency effective January 1, 1992.

TABLE B-5B Annual Water Quantities Delivered to Each Contractor

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (contd.)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	0	7,382	0	0	0	0	0	294,457
1969	0	0	0	9,970	0	0	0	0	0	268,104
1970	0	0	0	11,739	0	0	70	70	0	369,459
1971	0	0	0	12,490	0	192	64	256	0	654,442
1972	0	71,938	0	88,028	0	186	505	691	0	1,037,770
1973	0	159,883	0	217,226	0	53	679	732	0	737,532
1974	0	277,717	0	323,334	0	127	648	775	0	878,947
1975	0	526,491	0	583,919	0	253	405	658	0	1,230,830
1976	0	618,451	0	697,468	0	527	382	909	0	1,380,124
1977	0	189,755	0	241,161	0	706	303	1,009	0	582,381
1978	0	507,565	0	601,691	0	579	278	857	0	1,458,733
1979	0	477,074	0	587,476	0	302	329	631	0	1,666,457
1980	0	531,727	0	653,625	0	267	295	562	0	1,536,456
1981	0	795,846	0	951,182	0	221	355	576	0	1,918,563
1982	0	691,192	0	830,771	0	334	305	639	0	1,750,862
1983	0	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	0	457,582	0	569,571	108	177	272	557	0	1,591,416
1985	0	683,625	0	804,576	62	308	254	624	0	1,990,295
1986	0	708,840	0	836,368	328	313	317	958	0	1,999,155
1987	0	712,424	0	863,143	88	459	452	999	0	2,131,608
1988	0	902,564	0	1,056,271	303	385	523	1,211	0	2,385,122
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	0	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	0	391,447	988	442,693	265	328	420	1,013	0	549,113
1992	0	710,313	0	815,658	642	117	485	1,244	0	1,471,454
1993	0	652,190	0	818,737	746	256	444	1,446	0	2,315,235
1994	0	807,866	0	972,337	1,035	329	492	1,856	0	1,861,976
1995	0	436,042	0	601,951	910	203	308	1,421	0	2,031,423
1996	0	593,380	0	888,970	820	257	360	1,437	0	2,543,472
1997	0	721,810	1,850	1,003,254	1,005	185	231	1,421	0	2,405,444
1998	0	410,065	1,850	665,746	1,054	527	0	1,581	0	1,764,963
1999	0	852,617	1,850	1,122,518	1,096	286	0	1,382	0	2,898,961
2000	0	1,522,412	4,050	1,806,449	901	586	0	1,487	0	3,569,072
2001	0	1,023,169	1,850	1,188,690	1,065	513	0	1,578	0	2,175,194
2002	0	1,408,919	4,998	1,707,251	1,181	419	0	1,600	0	2,909,555
2003	116	1,701,615	5,000	1,936,350	1,324	551	0	1,875	0	3,327,811
2004	841	1,724,380	5,250	2,007,533	1,434	1,440	0	2,874	0	3,230,590
2005	692	1,528,045	1,665	1,812,911	1,054	0	0	1,054	0	3,752,507
2006	4,278	1,512,186	1,850	1,931,312	5,342	468	0	5,810	0	3,693,938
2007	3,935	1,499,688	3,000	1,879,129	2,327	956	0	3,283	0	3,284,475
2008	4,905	898,313	3,798	1,160,430	1,923	451	243	2,617	0	2,169,587
2009	6,397	930,871	3,891	1,189,387	2,114	581	200	2,895	0	2,221,501
2010	8,240	1,416,062	4,075	1,779,578	2,331	807	243	3,381	0	2,832,658
2011	10,503	1,685,302	4,000	2,041,084	2,297	1,092	98	3,487	0	3,663,541
2012	11,000	1,206,900	9,000	1,585,470	8,232	1,600	1,392	11,224	0	2,706,402
2013	10,380	1,146,900	9,000	1,565,380	5,760	1,602	1,447	8,809	0	2,491,404
2014	10,380	1,146,900	9,000	1,570,785	5,760	1,602	1,500	8,862	0	2,497,862
2015	10,380	1,146,900	9,000	1,567,380	5,760	1,602	1,562	8,924	0	2,494,519
2016	10,380	1,146,900	9,000	1,567,380	5,760	1,642	1,619	9,021	0	2,482,616
2017	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2018	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2019	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2020	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2021	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2022	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2023	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2024	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2025	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2026	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2027	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2028	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2029	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2030	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2031	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2032	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2033	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2034	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
2035	10,380	1,146,900	9,000	1,571,380	5,760	1,706	1,619	9,085	0	2,500,680
TOTAL	289,647	61,221,608	270,801	78,804,407	173,364	57,208	49,537	280,109	0	147,532,124

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 1 of 10

Calendar Year	NORTH BAY AQUEDUCT											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano County WA				Cordelia Pumping Plant Napa County FC&WCD			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery (a)	Total
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	24	(10)	1,214	1,228
1969	0	0	0	0	0	0	0	0	0	2	2,687	2,689
1970	0	0	0	0	0	0	0	0	0	18	3,618	3,636
1971	0	0	0	0	0	0	0	0	0	4	2,521	2,525
1972	0	0	0	0	0	0	0	0	0	(10)	3,647	3,637
1973	0	0	0	0	0	0	0	0	0	1	3,792	3,793
1974	0	0	0	0	0	0	0	0	0	10	4,870	4,880
1975	0	0	0	0	0	0	0	0	0	10	6,840	6,850
1976	0	0	0	0	0	0	0	0	0	4	7,122	7,126
1977	0	0	0	0	0	0	0	0	0	2	8,226	8,228
1978	0	0	0	0	0	0	0	0	0	(6)	6,034	6,028
1979	0	0	0	0	0	0	0	0	0	1	6,561	6,562
1980	0	0	0	0	0	0	0	0	0	(3)	6,707	6,704
1981	0	0	0	0	0	0	0	0	0	8	9,001	9,009
1982	0	0	0	0	0	0	0	0	0	(8)	1,213	1,205
1983	0	0	0	0	0	0	0	0	0	(12)	2,287	2,275
1984	0	0	0	0	0	0	0	0	0	(15)	2,923	2,908
1985	0	0	0	0	0	0	0	0	0	13	4,039	4,052
1986	0	0	0	0	0	0	0	0	0	(4)	3,519	3,515
1987	0	0	0	0	0	0	0	0	0	0	7,693	7,693
1988	1	283	15,118	15,402	0	0	9,725	9,725	1	(1)	5,392	5,392
1989	0	758	23,451	24,209	0	0	17,246	17,246	0	(4)	6,195	6,191
1990	0	3	26,071	26,074	0	(634)	15,856	15,222	0	3	6,940	6,943
1991	0	667	8,352	9,019	0	124	3,855	3,979	0	198	1,380	1,578
1992	0	1,643	18,774	20,417	0	0	9,220	9,220	0	0	4,001	4,001
1993	0	1,153	34,466	35,619	0	0	14,471	14,471	0	0	5,286	5,286
1994	0	780	32,048	32,828	0	(6)	14,913	14,907	0	0	6,792	6,792
1995	0	908	26,527	27,435	0	0	15,893	15,893	0	0	5,182	5,182
1996	0	1,354	34,892	36,246	0	0	17,069	17,069	0	0	4,893	4,893
1997	0	1,422	37,871	39,293	0	0	17,501	17,501	0	0	4,341	4,341
1998	0	1,343	35,125	36,468	0	0	18,204	18,204	0	0	5,359	5,359
1999	0	2,522	40,057	42,579	0	0	19,562	19,562	0	0	5,304	5,304
2000	0	1,853	31,738	33,591	0	4	21,525	21,529	0	180	4,958	5,138
2001	0	1,760	35,571	37,331	0	0	19,737	19,737	0	0	9,345	9,345
2002	0	496	36,846	37,342	0	0	19,719	19,719	0	0	6,875	6,875
2003	0	3,991	34,579	38,570	0	0	16,700	16,700	0	0	7,637	7,637
2004	0	2,181	40,141	42,322	0	0	21,686	21,686	0	0	8,499	8,499
2005	0	935	36,884	37,819	0	0	19,189	19,189	0	0	8,009	8,009
2006	0	1,005	35,519	36,524	0	0	18,651	18,651	0	0	8,081	8,081
2007	0	1,189	42,765	43,954	0	0	27,793	27,793	0	0	11,277	11,277
2008	0	845	46,601	47,446	0	0	19,436	19,436	0	255	13,740	13,995
2009	0	537	35,032	35,569	0	0	15,473	15,473	0	130	11,377	11,507
2010	0	809	38,676	39,485	0	0	12,788	12,788	0	254	12,847	13,101
2011	0	803	34,238	35,041	0	0	12,832	12,832	0	213	11,275	11,488
2012	0	51	64,979	65,030	0	0	35,054	35,054	0	5	18,921	18,926
2013	0	51	45,979	46,030	0	0	10,603	10,603	0	5	17,415	17,420
2014	0	51	46,979	47,030	0	0	10,603	10,603	0	5	17,415	17,420
2015	0	51	46,979	47,030	0	0	11,210	11,210	0	5	17,415	17,420
2016	0	51	45,979	46,030	0	0	12,450	12,450	0	5	17,415	17,420
2017	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2018	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2019	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2020	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2021	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2022	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2023	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2024	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2025	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2026	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2027	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2028	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2029	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2030	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2031	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2032	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2033	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2034	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420
2035	0	51	45,979	46,030	0	0	12,571	12,571	0	5	17,415	17,420

(a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 2 of 10

Calendar Year	SOUTH BAY AQUEDUCT						CALIFORNIA AQUEDUCT									
	South Bay Pumping Plant						North San Joaquin Division Banks Pumping Plant									
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Transportation Water			Conservation Water	Total		
				Water Supply (b)	Recreation					Water Supply	Recreation	Total				
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]			
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1962	9	272	0	8,906	0	9,187	0	0	0	0	0	0	0	0		
1963	71	185	0	12,645	0	12,901	0	0	0	0	0	0	0	0		
1964	171	152	0	20,911	0	21,234	0	0	0	0	0	0	0	0		
1965	93	729	0	34,026	0	34,848	0	0	0	0	0	0	0	0		
1966	0	1,746	0	54,913	0	56,659	0	0	0	0	0	0	0	0		
1967	0	1,677	0	56,763	0	58,440	5,746	1,183	0	11,538	0	18,467	2,957	21,424		
1968	0	1,847	0	101,055	0	102,902	11,079	74,464	0	293,243	0	378,786	531,275	910,061		
1969	3,449	2,668	0	69,712	0	75,829	7,336	44,287	0	265,417	0	317,040	531,185	848,225		
1970	16,279	1,086	(5,355)	89,560	0	101,570	23,947	20,267	(5,355)	365,771	0	405,130	(12,995)	392,135		
1971	0	1,815	8,854	98,584	0	109,253	23,207	(10,754)	8,854	651,665	8	672,980	7,708	680,688		
1972	0	3,557	2,273	138,426	0	144,256	145,066	9,057	(4,285)	1,033,432	6,489	1,189,759	48,300	1,238,059		
1973	0	(33)	(1,510)	94,078	0	92,535	214,941	(4,951)	2,902	733,008	1,155	947,055	55,846	1,002,901		
1974	0	1,287	(10,056)	89,318	0	80,549	247,894	(11,526)	(32,510)	873,302	2,118	1,079,278	54,683	1,133,961		
1975	0	320	8,550	93,604	0	102,474	110,149	(8,092)	16,101	1,223,332	3,377	1,344,867	(102,625)	1,242,242		
1976	0	2,431	1,391	126,431	141	130,394	67,834	5,443	(244,124)	1,372,093	1,745	1,202,991	(442,348)	760,643		
1977	0	2,866	2,685	107,704	112	113,367	0	39,897	(157,543)	573,146	1,111	456,611	(13,507)	443,104		
1978	0	2,165	(11,249)	112,574	126	103,616	67,457	(36,898)	35,129	1,451,842	1,177	1,518,707	752,075	2,270,782		
1979	0	2,401	1,069	122,190	89	125,749	17,397	60,958	(32,307)	1,659,265	1,398	1,706,711	(112,053)	1,594,658		
1980	0	1,758	(6,563)	115,824	123	111,142	3,159	58,484	(275,538)	1,529,187	2,131	1,317,423	186,601	1,504,024		
1981	0	2,627	13,742	129,507	121	145,997	46,060	85,350	40,536	1,908,986	4,974	2,085,906	(931,878)	1,154,028		
1982	0	2,344	(23,928)	107,439	129	85,984	5,979	61,556	99,897	1,743,145	4,646	1,915,223	347,983	2,263,206		
1983	0	2,151	(22,886)	94,656	132	74,053	6,071	47,022	(310,477)	1,184,282	7,853	934,751	835,771	1,770,522		
1984	0	2,088	8,442	98,122	158	108,810	38,649	97,143	(108,548)	1,587,936	5,874	1,621,054	21,875	1,642,929		
1985	0	2,817	(1,607)	122,088	152	123,450	0	110,469	137,783	1,985,632	5,452	2,239,336	(110,569)	2,128,767		
1986	0	2,299	(1,850)	110,988	130	111,567	0	90,799	20,177	1,993,278	3,865	2,108,119	200,298	2,308,417		
1987	0	2,625	(584)	136,796	137	138,974	0	91,427	(23,116)	2,121,366	7,672	2,197,349	(458,725)	1,738,624		
1988	0	2,884	(698)	147,255	142	149,583	0	107,249	(35,484)	2,368,793	4,889	2,445,447	(303,583)	2,141,864		
1989	0	2,673	3,296	142,269	152	148,390	0	117,603	(38,058)	2,829,107	8,135	2,916,787	421,131	3,337,918		
1990	0	894	1,982	156,537	168	159,581	0	99,059	(290,965)	2,554,658	9,262	2,372,014	(374,027)	1,997,987		
1991	0	2,637	(4,532)	50,259	150	48,514	0	80,106	(79,038)	1,539,748	4,879	545,695	554,904	1,100,599		
1992	0	2,861	756	76,661	147	80,445	0	91,391	(218,170)	1,451,436	2,605	1,327,262	61,343	1,388,605		
1993	0	1,940	(20,051)	105,971	143	88,003	0	149,372	(273,789)	2,279,323	2,609	2,157,515	849,249	3,006,764		
1994	0	1,981	1,714	100,568	168	104,431	0	148,712	(120,985)	1,828,072	3,803	1,859,602	(324,640)	1,534,962		
1995	0	1,188	(12,333)	76,640	146	65,641	0	173,074	(397,605)	2,003,475	2,575	1,781,519	293,159	2,074,678		
1996	0	981	(1,990)	77,215	150	76,356	0	123,502	78,123	2,507,143	3,902	2,712,670	288,576	3,001,246		
1997	0	1,575	5,016	102,186	155	108,932	527	135,106	(98,334)	2,366,152	2,594	2,406,045	(50,000)	2,356,045		
1998	0	1,551	3,595	70,876	114	76,136	0	91,319	(346,039)	1,728,257	2,107	1,475,644	120,886	1,596,530		
1999	0	2,166	12,313	100,497	139	115,115	0	135,809	(17,569)	2,855,522	4,301	2,978,063	(307,839)	2,670,224		
2000	0	2,346	(20,958)	135,533	149	117,066	0	115,895	(13,232)	3,474,523	5,182	3,582,368	(15,487)	3,566,881		
2001	0	2,784	1,301	95,335	196	99,616	0	222,144	(17,529)	1,874,096	1,978	2,080,689	86,928	2,167,617		
2002	0	2,534	(13,938)	123,577	146	112,319	0	225,032	36,404	2,816,389	4,672	3,082,497	(151,719)	2,930,778		
2003	0	2,920	(1,399)	132,714	131	134,366	0	329,699	(49,580)	3,193,449	11,362	3,484,930	225,348	3,710,278		
2004	0	2,982	(7,240)	125,928	150	121,820	0	87,788	(4,079)	2,979,217	1,337	3,060,263	103,811	3,164,074		
2005	0	2,823	(3,565)	108,136	154	107,548	0	151,931	(163,243)	3,665,023	1,270	3,654,981	535,754	4,190,735		
2006	0	2,989	(9,645)	118,272	169	111,785	0	67,040	(129,767)	3,571,009	1,208	3,509,490	43,481	3,552,971		
2007	0	2,840	14,928	134,172	146	152,086	0	73,956	133,124	2,756,094	830	2,944,004	(398,297)	2,545,707		
2008	0	2,215	880	116,582	166	119,823	0	130,066	(3,350)	1,420,450	1,082	1,548,248	(397,949)	1,150,299		
2009	0	1,999	(1,134)	116,947	108	117,920	0	111,805	(1,860)	1,572,819	2,023	1,684,787	928,666	2,613,453		
2010	0	1,717	3,436	95,802	117	101,072	0	203,757	51,667	2,243,593	1,163	2,500,180	37,606	2,537,786		
2011	0	1,534	(2,332)	112,952	122	112,276	0	314,282	(21,148)	3,315,089	1,588	3,609,811	165,312	3,775,123		
2012	0	(2,895)	(14,797)	129,213	400	111,921	0	25,554	(9,803)	2,627,823	8,660	2,652,234	(242,798)	2,409,436		
2013	0	(2,883)	201	125,571	400	123,289	0	25,656	196	2,436,616	8,660	2,471,128	506,197	2,977,325		
2014	0	(2,883)	201	125,571	400	123,289	0	71,451	193	2,442,021	8,660	2,522,325	30,977	2,553,302		
2015	0	3,351	0	132,571	400	136,322	0	130,445	32,003	2,438,616	8,660	2,609,724	(31,516)	2,578,208		
2016	0	3,351	0	132,571	400	136,322	0	128,415	(28,401)	2,427,616	8,660	2,536,290	205,134	2,741,424		
2017	0	3,351	0	135,571	400	139,322	0	128,602	61,309	2,445,616	8,660	2,644,187	119,885	2,764,072		
2018	0	3,351	0	135,571	400	139,322	0	128,369	(80,817)	2,445,616	8,660	2,501,828	(194,534)	2,307,294		
2019	0	3,351	0	135,571	400	139,322	0	128,613	50,179	2,445,616	8,660	2,633,068	77,224	2,710,292		
2020	0	3,351	0	135,571	400	139,322	0	128,690	(366)	2,445,616	8,660	2,582,600	(8,687)	2,573,913		
2021	0	3,351	0	135,571	400	139,322	0	128,769	10,725	2,445,616	8,660	2,593,770	(1,095)	2,592,675		
2022	0	3,351	0	135,571	400	139,322	0	128,846	(3,483)	2,445,616	8,660	2,579,639	(185,907)	2,393,732		
2023	0	3,351	0	135,571	400	139,322	0	128,818	(18,971)	2,445,616	8,660	2,564,123	115,791	2,679,914		
2024	0	3,351	0	135,571	400	139,322	0	128,625	11,289	2,445,616	8,660	2,594,190	79,858	2,674,048		
2025	0	3,351	0	135,571	400	139,322	0	130,380	(12,518)	2,445,616	8,660	2,572,138	(247,205)	2,324,933		
2026	0	3,351	0	135,571	400	139,322	0	128,700	24,308	2,445,616	8,660	2,607,284	246,850	2,854,134		
2027	0	3,351	0	135,571	400	139,322	0	128,692	(17,799)	2,445,616	8,660	2,565,169	(12,304)	2,552,865		
2028	0	3,351	0	135,571	400	139,322	0	128,783	12,291	2,445,616	8,660	2,595,350	15,430	2,610,780		
2029	0	3,351	0	135,571	400	139,322	0	128,671	(9,046)	2,445,616	8,660	2,573,901	(10,778)	2,563,123		
2030	0	3,351	0	135,571	400	139,322	0	128,777	20,756	2,445,616	8,660	2,603,809	124,586	2,728,395		
2031	0	3,351	0	135,571	400	139,322	0	128,134	(97,726)	2,445,616	8,660	2,484,684	(259,831)	2,224,853		
2032	0	3,351	0	135,571	400	139,322	0	128,005	84,999	2,445,616	8,660	2,667,280	138,527	2,805,807		
2033	0	3,351	0	135,571	400	139,322	0	127,876	(94,652)	2,445,616	8,660	2,487,500	(184,372)	2,303,128		
2034	0	3,351	0	135,571	400	139,322	0	127,725	69,593	2,445,616	8,660	2,651,594	120,375	2,771,969		
2035	0	3,351	0	135,571	400	139,322	0	127,379	(242,659)	2,445,616	8,660	2,33				

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 3 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	San Luis Division						South San Joaquin Division					
	Dos Amigos Pumping Plant						Buena Vista Pumping Plant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	11,079	25,126	0	189,104	0	225,309	0	0	0	0	0	
1969	3,887	9,922	0	192,689	0	206,498	0	0	0	0	0	
1970	7,668	1,901	0	270,300	0	279,869	4,779	1,012	0	3	5,794	
1971	23,207	(12,030)	0	545,869	0	557,046	7,853	8,399	0	101,512	0	
1972	145,066	(6,635)	(6,558)	886,840	6,481	1,025,194	100,274	20,044	(6,558)	223,626	6,481	
1973	214,941	(6,778)	1,329	635,716	1,147	846,355	204,638	35,695	1,329	311,096	1,147	
1974	247,894	(16,765)	(15,295)	780,513	2,108	998,455	237,554	19,672	(15,295)	388,949	2,108	
1975	110,149	(12,144)	(693)	1,126,152	3,358	1,226,822	103,352	26,342	(693)	672,531	3,358	
1976	67,834	(456)	(152,171)	1,241,550	1,581	1,158,338	61,122	29,428	(152,171)	785,055	1,581	
1977	0	26,359	(116,219)	463,970	737	374,847	0	25,173	(116,219)	271,944	560	
1978	67,457	1,905	79,308	1,335,362	680	1,484,712	65,027	17,751	121,904	762,043	674	
1979	17,397	33,884	(51,299)	1,530,926	685	1,531,593	12,302	46,157	(51,299)	737,714	502	
1980	3,159	34,391	(272,825)	1,407,663	1,514	1,173,902	0	49,025	(134,009)	778,059	1,262	
1981	46,060	36,962	23,359	1,775,179	4,348	1,885,908	0	38,942	23,359	1,077,322	4,112	
1982	5,979	57,146	116,086	1,631,868	4,205	1,815,284	0	29,059	117,174	990,863	4,045	
1983	6,071	63,583	(101,155)	1,085,804	7,475	1,061,778	0	40,205	(101,155)	593,920	7,291	
1984	38,649	109,263	(112,744)	1,484,114	5,391	1,524,673	0	38,487	(114,984)	781,955	5,244	
1985	0	86,772	138,898	1,858,111	4,936	2,088,717	0	42,838	139,689	992,606	4,804	
1986	0	51,963	19,989	1,877,183	3,426	1,952,561	0	36,751	37,546	1,014,294	3,285	
1987	0	64,827	(25,707)	1,978,945	7,121	2,025,186	0	30,495	(25,522)	1,027,361	6,937	
1988	0	72,679	(34,592)	2,217,126	4,490	2,259,703	0	38,804	(29,747)	1,244,196	4,360	
1989	0	90,900	(29,411)	2,679,845	7,652	2,748,176	0	29,594	(60,826)	1,532,625	7,490	
1990	0	115,074	(11,323)	2,394,999	8,922	2,507,672	0	46,865	(15,092)	1,769,991	8,879	
1991	0	92,227	9,325	489,348	4,605	595,505	0	39,274	96,506	446,916	4,560	
1992	0	118,796	(225,603)	1,372,536	2,079	1,267,808	0	28,138	(98,271)	920,978	1,995	
1993	0	136,432	(220,537)	2,170,494	1,864	2,088,253	0	14,186	(128,363)	908,200	1,676	
1994	0	152,414	(78,957)	1,724,433	3,098	1,800,988	0	35,083	(88,211)	1,107,122	2,918	
1995	0	137,937	(12,473)	1,921,666	1,711	2,048,841	0	33,963	(16,431)	706,742	1,669	
1996	0	45,591	14,927	2,425,024	2,998	2,488,540	0	31,304	15,438	988,612	2,928	
1997	527	107,033	(66,814)	2,247,628	2,090	2,290,464	0	42,670	40,852	1,054,461	2,076	
1998	0	95,185	(338,076)	1,664,080	1,589	1,422,778	0	41,910	(106,487)	753,731	1,585	
1999	0	95,262	(2,778)	2,750,154	3,285	2,845,923	0	48,502	(2,807)	1,131,826	3,279	
2000	0	134,231	7,726	3,273,337	4,222	3,419,516	0	37,514	7,726	1,814,685	4,216	
2001	0	150,830	(18,830)	1,615,776	1,218	1,748,994	0	31,361	(18,830)	1,318,835	1,211	
2002	0	92,905	50,342	2,628,462	3,968	2,775,677	0	41,565	50,342	1,831,874	3,961	
2003	0	85,360	(48,181)	2,893,333	10,656	2,941,168	0	43,352	(48,181)	1,909,192	10,645	
2004	0	25,865	2,161	2,807,825	652	2,837,503	0	41,551	3,161	2,102,371	649	
2005	0	62,569	(159,678)	3,423,490	581	3,326,962	0	35,019	(159,678)	1,846,180	559	
2006	0	(12,341)	(120,122)	3,501,308	504	3,369,349	0	30,271	(120,122)	2,077,130	504	
2007	0	47,736	118,196	2,419,032	312	2,585,276	0	43,400	118,196	2,002,793	305	
2008	0	103,375	(4,230)	1,302,788	361	1,402,294	0	39,056	(4,230)	1,275,174	327	
2009	0	76,206	(726)	1,318,452	1,367	1,395,299	0	32,900	(726)	1,217,847	1,295	
2010	0	76,447	48,231	2,307,963	636	2,433,277	0	43,377	48,231	1,505,105	603	
2011	0	66,937	(18,816)	3,344,113	870	3,393,104	0	39,914	(18,816)	1,819,979	742	
2012	0	17,839	4,994	2,492,655	7,210	2,522,698	0	(11,623)	4,994	1,709,969	7,010	
2013	0	17,929	(5)	2,291,544	7,210	2,316,678	0	(11,533)	(5)	1,617,769	7,010	
2014	0	17,930	(8)	2,132,001	7,210	2,157,133	0	(11,532)	(8)	1,479,906	7,010	
2015	0	70,654	32,003	2,122,606	7,210	2,232,473	0	41,192	32,003	1,479,711	7,010	
2016	0	70,354	(28,401)	2,116,934	7,210	2,166,097	0	40,892	(28,401)	1,485,239	7,010	
2017	0	70,586	61,309	2,133,784	7,210	2,272,899	0	41,124	61,309	1,491,389	7,010	
2018	0	70,740	(80,817)	2,133,784	7,210	2,130,917	0	41,278	(80,817)	1,491,389	7,010	
2019	0	70,564	50,179	2,133,784	7,210	2,261,737	0	41,102	50,179	1,491,389	7,010	
2020	0	70,628	(366)	2,133,784	7,210	2,211,256	0	41,166	(366)	1,491,389	7,010	
2021	0	70,711	10,725	2,133,784	7,210	2,222,430	0	41,249	10,725	1,491,389	7,010	
2022	0	70,705	(3,483)	2,133,784	7,210	2,208,216	0	41,243	(3,483)	1,491,389	7,010	
2023	0	70,696	(18,971)	2,133,784	7,210	2,192,719	0	41,234	(18,971)	1,491,389	7,010	
2024	0	70,575	11,289	2,133,784	7,210	2,222,858	0	41,113	11,289	1,491,389	7,010	
2025	0	70,638	(12,518)	2,133,784	7,210	2,199,114	0	41,176	(12,518)	1,491,389	7,010	
2026	0	70,650	24,308	2,133,784	7,210	2,235,952	0	41,188	24,308	1,491,389	7,010	
2027	0	70,563	(17,799)	2,133,784	7,210	2,193,758	0	41,101	(17,799)	1,491,389	7,010	
2028	0	70,703	12,291	2,133,784	7,210	2,223,988	0	41,241	12,291	1,491,389	7,010	
2029	0	70,630	(9,046)	2,133,784	7,210	2,202,578	0	41,168	(9,046)	1,491,389	7,010	
2030	0	70,694	20,756	2,133,784	7,210	2,232,444	0	41,232	20,756	1,491,389	7,010	
2031	0	70,566	(97,726)	2,133,784	7,210	2,113,834	0	41,104	(97,726)	1,491,389	7,010	
2032	0	70,168	84,999	2,133,784	7,210	2,296,161	0	40,706	84,999	1,491,389	7,010	
2033	0	70,373	(94,652)	2,133,784	7,210	2,116,715	0	40,911	(94,652)	1,491,389	7,010	
2034	0	69,865	69,593	2,133,784	7,210	2,280,452	0	40,403	69,593	1,491,389	7,010	
2035	0	69,205	(242,659)	2,133,784	7,210	1,967,540	0	39,743	(242,659)	1,491,389	7,010	

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

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Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	South San Joaquin Division (continued)											
	Teerink Pumping Plant						Chrisman Pumping Plant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]	[50]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	198	2	0	0	200	0	0	0	0	0	0	
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	0	0	7,207	
1972	100,274	12,765	(6,558)	84,955	6,481	197,917	100,274	13,160	(6,558)	78,891	6,481	192,248
1973	204,638	21,543	1,329	229,685	1,147	458,342	204,638	32,414	1,329	209,769	1,147	449,297
1974	237,554	11,843	(15,295)	336,198	2,108	572,408	237,554	17,655	(15,295)	318,198	2,108	560,220
1975	103,352	19,763	(693)	621,706	3,358	747,486	103,352	25,326	(693)	586,286	3,358	717,629
1976	61,122	18,552	(152,171)	740,486	1,581	669,570	61,122	21,468	(152,171)	700,935	1,581	632,935
1977	0	16,415	(116,219)	246,349	560	147,105	0	15,698	(116,219)	240,191	560	140,230
1978	65,027	28,820	121,904	631,121	674	847,546	65,027	26,705	121,904	599,973	674	814,283
1979	12,302	50,663	(51,299)	625,561	502	637,729	12,302	50,580	(51,299)	586,959	502	599,044
1980	0	48,825	(134,009)	696,405	1,262	612,483	0	58,085	(134,009)	658,588	1,262	612,483
1981	0	51,600	23,359	998,307	4,112	1,077,378	0	48,844	23,359	959,274	4,112	1,035,589
1982	0	44,353	117,332	878,486	4,045	1,044,216	0	33,541	117,277	830,704	4,045	985,567
1983	0	43,961	(101,155)	487,915	7,291	438,012	0	34,698	(101,155)	450,489	7,291	391,323
1984	0	45,999	(115,088)	632,262	5,244	568,417	0	33,132	(115,092)	582,414	5,244	505,698
1985	0	50,106	139,973	854,684	4,804	1,049,567	0	54,831	139,954	810,606	4,804	1,010,195
1986	0	38,747	37,546	882,300	3,285	961,878	0	41,421	37,546	839,839	3,285	922,091
1987	0	47,815	(25,522)	897,905	6,937	927,135	0	33,195	(25,522)	863,157	6,937	877,767
1988	0	53,815	(29,747)	1,097,643	4,360	1,126,071	0	39,775	(29,747)	1,055,649	4,360	1,070,037
1989	0	49,088	(60,826)	1,382,599	7,490	1,378,351	0	42,307	(60,826)	1,339,358	7,490	1,328,329
1990	0	66,868	(15,092)	1,627,246	8,879	1,687,901	0	56,663	(15,092)	1,590,893	8,879	1,641,343
1991	0	40,564	105,176	446,148	4,560	596,448	0	34,016	105,176	446,148	4,560	589,900
1992	0	31,820	(92,123)	844,376	1,995	786,068	0	34,477	(92,123)	820,133	1,995	764,482
1993	0	27,158	(127,738)	799,143	1,676	700,239	0	28,614	(127,738)	771,146	1,676	673,698
1994	0	50,802	(88,211)	1,007,214	2,918	972,723	0	57,203	(88,211)	977,703	2,918	949,613
1995	0	48,705	(16,431)	586,829	1,669	620,772	0	36,309	(16,431)	560,695	1,669	582,242
1996	0	58,437	15,438	836,819	2,928	913,622	0	43,710	15,438	800,633	2,928	862,709
1997	0	73,656	40,852	918,124	2,076	1,034,708	0	62,275	40,852	891,843	2,076	987,046
1998	0	61,137	(106,487)	656,796	1,585	613,031	0	47,523	(106,487)	628,084	1,585	570,705
1999	0	77,334	(2,807)	1,011,608	3,279	1,089,414	0	55,514	(2,807)	974,807	3,279	1,030,793
2000	0	87,084	7,726	1,691,120	4,216	1,790,146	0	49,690	7,726	1,651,057	4,216	1,712,689
2001	0	71,588	(18,830)	1,233,862	1,211	1,287,831	0	54,742	(18,830)	1,202,670	1,211	1,239,793
2002	0	108,309	50,342	1,740,813	3,961	1,903,425	0	69,443	50,342	1,699,261	3,961	1,823,007
2003	0	106,973	(48,181)	1,825,617	10,645	1,895,054	0	57,291	(48,181)	1,789,015	10,645	1,808,770
2004	0	122,559	3,161	2,032,528	649	2,158,897	0	60,847	3,161	1,992,344	649	2,057,001
2005	0	99,523	(159,678)	1,751,799	559	1,692,203	0	53,502	(159,678)	1,711,929	559	1,606,312
2006	0	128,022	(120,122)	1,967,163	504	1,975,567	0	46,463	(120,122)	1,920,919	504	1,847,764
2007	0	139,502	118,196	1,910,800	305	2,168,803	0	59,454	118,196	1,863,410	305	2,041,365
2008	0	97,209	(4,230)	1,201,345	327	1,294,651	0	51,709	(4,230)	1,168,316	327	1,216,122
2009	0	88,574	(726)	1,169,477	1,295	1,258,620	0	43,229	(726)	1,146,258	1,295	1,190,056
2010	0	92,345	48,231	1,409,122	603	1,550,301	0	59,808	48,231	1,389,990	603	1,498,632
2011	0	114,286	(18,816)	1,695,667	742	1,791,879	0	67,210	(18,816)	1,653,509	742	1,702,645
2012	0	(15,253)	4,994	1,612,489	7,010	1,609,220	0	(15,503)	4,994	1,585,316	7,010	1,581,817
2013	0	(15,163)	(5)	1,540,269	7,010	1,532,111	0	(15,413)	(5)	1,513,116	7,010	1,504,708
2014	0	(15,162)	(8)	1,402,406	7,010	1,394,246	0	(15,412)	(8)	1,375,253	7,010	1,366,843
2015	0	37,562	32,003	1,402,211	7,010	1,478,786	0	37,312	32,003	1,375,058	7,010	1,451,383
2016	0	37,262	(28,401)	1,407,739	7,010	1,423,610	0	37,012	(28,401)	1,380,586	7,010	1,396,207
2017	0	37,494	61,309	1,413,889	7,010	1,519,702	0	37,244	61,309	1,386,736	7,010	1,492,299
2018	0	37,648	(80,817)	1,413,889	7,010	1,377,730	0	37,398	(80,817)	1,386,736	7,010	1,350,327
2019	0	37,472	50,179	1,413,889	7,010	1,508,550	0	37,222	50,179	1,386,736	7,010	1,481,147
2020	0	37,536	(366)	1,413,889	7,010	1,458,069	0	37,286	(366)	1,386,736	7,010	1,430,666
2021	0	37,619	10,725	1,413,889	7,010	1,469,243	0	37,369	10,725	1,386,736	7,010	1,441,840
2022	0	37,613	(3,483)	1,413,889	7,010	1,455,029	0	37,363	(3,483)	1,386,736	7,010	1,427,626
2023	0	37,604	(18,971)	1,413,889	7,010	1,439,532	0	37,354	(18,971)	1,386,736	7,010	1,412,129
2024	0	37,483	11,289	1,413,889	7,010	1,469,671	0	37,233	11,289	1,386,736	7,010	1,442,268
2025	0	37,546	(12,518)	1,413,889	7,010	1,445,927	0	37,296	(12,518)	1,386,736	7,010	1,418,524
2026	0	37,558	24,308	1,413,889	7,010	1,482,765	0	37,308	24,308	1,386,736	7,010	1,455,362
2027	0	37,471	(17,799)	1,413,889	7,010	1,440,571	0	37,221	(17,799)	1,386,736	7,010	1,413,168
2028	0	37,611	12,291	1,413,889	7,010	1,470,801	0	37,361	12,291	1,386,736	7,010	1,443,398
2029	0	37,538	(9,046)	1,413,889	7,010	1,449,391	0	37,288	(9,046)	1,386,736	7,010	1,421,988
2030	0	37,602	20,756	1,413,889	7,010	1,479,257	0	37,352	20,756	1,386,736	7,010	1,451,854
2031	0	37,474	(97,726)	1,413,889	7,010	1,360,647	0	37,224	(97,726)	1,386,736	7,010	1,333,244
2032	0	37,076	84,999	1,413,889	7,010	1,542,974	0	36,826	84,999	1,386,736	7,010	1,515,571
2033	0	37,281	(94,652)	1,413,889	7,010	1,363,528	0	37,031	(94,652)	1,386,736	7,010	1,336,125
2034	0	36,773	69,593	1,413,889	7,010	1,527,265	0	36,523	69,593	1,386,736	7,010	1,499,862
2035	0	36,113	(242,659)	1,413,889	7,010	1,214,353	0	35,863	(242,659)	1,386,736	7,010	1,186,950

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 5 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	Tehachapi Division						Mojave Division					
	Edmonston Pumping Plant						Alamo Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]	[59]	[60]	[61]	[62]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	5,446	8	0	0	0	5,454	0	0	0	0	0	
1972	100,274	16,067	(6,558)	74,123	6,481	190,387	0	0	0	0	0	
1973	204,638	34,051	1,329	207,808	1,147	448,973	0	0	0	0	0	
1974	237,554	18,181	(15,295)	313,634	2,108	556,182	0	0	0	0	0	
1975	103,352	20,183	(693)	573,219	3,358	699,419	0	0	0	0	0	
1976	61.122	21,096	(152,171)	685,768	1,581	617,396	0	0	0	0	0	
1977	0	18,424	(116,219)	236,086	560	138,851	0	0	0	0	0	
1978	65,027	20,887	121,904	590,329	674	798,821	0	0	0	0	0	
1979	12,302	46,332	(51,299)	568,338	502	576,175	0	0	0	0	0	
1980	0	52,967	(134,009)	639,743	1,262	559,963	0	0	0	0	0	
1981	0	40,602	23,359	938,482	4,112	1,006,555	0	0	0	0	0	
1982	0	37,244	117,296	812,206	4,045	970,791	0	0	0	0	0	
1983	0	40,690	(101,155)	431,182	7,291	378,008	0	0	0	0	0	
1984	0	42,112	(115,214)	556,830	5,244	488,972	0	0	0	0	0	
1985	0	45,265	139,988	792,477	4,804	982,534	0	0	0	0	0	
1986	0	36,918	37,546	823,067	3,285	900,816	0	14,735	12,258	429,864	1,508	458,365
1987	0	29,580	(25,522)	851,322	6,937	862,317	0	11,665	(15,270)	417,870	1,239	415,504
1988	0	42,017	(29,747)	1,044,737	4,360	1,061,367	0	21,696	1,101	537,568	971	561,336
1989	0	32,270	(60,826)	1,328,041	7,490	1,306,975	0	4,686	(20,363)	716,360	1,407	702,090
1990	0	42,198	(15,092)	1,579,466	8,879	1,615,451	0	8,898	(5,916)	788,111	1,388	792,481
1991	0	33,999	105,176	441,217	4,560	584,952	0	17,908	34,422	177,308	394	230,032
1992	0	23,121	(92,123)	809,771	1,995	742,764	0	14,873	(17,115)	374,110	423	372,291
1993	0	11,946	(127,738)	759,485	1,676	645,369	0	9,304	(3,455)	308,222	443	314,514
1994	0	40,808	(88,211)	960,815	2,918	916,330	0	21,837	3,395	469,996	430	495,658
1995	0	36,001	(16,431)	542,465	1,669	563,704	0	14,139	(30,761)	384,836	427	368,641
1996	0	37,357	15,438	779,918	2,928	835,641	0	7,247	(11,410)	493,852	565	490,254
1997	0	51,475	40,852	860,798	2,076	955,201	0	20,725	38,960	537,586	507	597,778
1998	0	48,601	(106,487)	607,301	1,585	551,000	0	21,456	16,361	398,385	363	436,655
1999	0	52,726	(2,807)	947,420	3,279	1,000,618	0	26,644	(8,486)	589,756	396	608,310
2000	0	43,072	7,726	1,627,123	4,216	1,682,137	0	8,983	(10,472)	958,997	449	957,957
2001	0	39,544	(18,830)	1,187,300	1,211	1,209,225	0	14,526	3,478	709,985	452	728,441
2002	0	60,037	50,342	1,680,514	3,961	1,794,854	0	15,190	8,398	901,230	490	925,308
2003	0	53,320	(48,181)	1,771,048	10,645	1,786,832	0	13,676	(20,787)	1,035,349	355	1,028,593
2004	0	57,962	3,161	1,970,391	649	2,032,163	0	15,581	17,207	1,120,384	171	1,153,343
2005	0	40,949	(159,678)	1,693,409	559	1,575,239	0	2,561	(50,014)	1,116,158	84	1,068,789
2006	0	52,291	(120,122)	1,898,070	504	1,830,743	0	13,170	8,653	1,281,524	98	1,303,445
2007	0	65,423	118,196	1,836,977	305	2,020,901	0	17,957	(5,091)	1,076,227	103	1,089,196
2008	0	50,959	(4,230)	1,146,056	327	1,193,112	0	14,592	5,383	614,224	80	634,279
2009	0	59,186	(726)	1,125,654	1,295	1,185,409	0	25,599	(5,619)	493,685	1,100	514,765
2010	0	61,816	48,231	1,369,128	603	1,479,778	0	33,660	6,964	956,888	363	997,875
2011	0	64,370	(18,816)	1,631,744	742	1,678,040	0	34,783	(1,405)	1,220,378	500	1,254,256
2012	0	(17,053)	4,994	1,564,750	7,010	1,559,701	0	(3,772)	4,922	1,016,964	1,630	1,019,744
2013	0	(16,963)	(5)	1,492,550	7,010	1,482,592	0	(3,682)	(78)	930,162	1,630	928,032
2014	0	(16,962)	(8)	1,354,687	7,010	1,344,727	0	(3,681)	(82)	932,489	1,630	930,366
2015	0	35,762	32,003	1,354,492	7,010	1,429,267	0	21,066	22,604	930,104	1,630	975,404
2016	0	35,462	(28,401)	1,360,020	7,010	1,374,091	0	20,829	(21,084)	935,432	1,630	936,807
2017	0	35,694	61,309	1,366,170	7,010	1,470,183	0	20,895	33,266	941,282	1,630	997,073
2018	0	35,848	(80,817)	1,366,170	7,010	1,328,211	0	20,998	(50,078)	941,282	1,630	913,832
2019	0	35,672	50,179	1,366,170	7,010	1,459,031	0	20,924	31,508	941,282	1,630	995,344
2020	0	35,736	(366)	1,366,170	7,010	1,408,550	0	20,947	(3,398)	941,282	1,630	960,461
2021	0	35,819	10,725	1,366,170	7,010	1,419,724	0	20,946	(1,117)	941,282	1,630	962,741
2022	0	35,813	(3,483)	1,366,170	7,010	1,405,510	0	20,940	(3,434)	941,282	1,630	960,418
2023	0	35,804	(18,971)	1,366,170	7,010	1,390,013	0	20,939	(18,638)	941,282	1,630	945,213
2024	0	35,683	11,289	1,366,170	7,010	1,420,152	0	20,881	21,309	941,282	1,630	985,102
2025	0	35,746	(12,518)	1,366,170	7,010	1,396,408	0	20,965	(11,624)	941,282	1,630	952,253
2026	0	35,758	24,308	1,366,170	7,010	1,433,246	0	20,930	13,030	941,282	1,630	976,872
2027	0	35,671	(17,799)	1,366,170	7,010	1,391,052	0	20,861	(6,161)	941,282	1,630	957,612
2028	0	35,811	12,291	1,366,170	7,010	1,421,282	0	20,961	4,006	941,282	1,630	967,876
2029	0	35,738	(9,046)	1,366,170	7,010	1,399,872	0	20,955	(913)	941,282	1,630	962,954
2030	0	35,802	20,756	1,366,170	7,010	1,429,738	0	20,930	8,528	941,282	1,630	972,370
2031	0	35,674	(97,726)	1,366,170	7,010	1,311,128	0	20,956	(31,057)	941,282	1,630	932,811
2032	0	35,276	84,999	1,366,170	7,010	1,493,455	0	20,865	43,953	941,282	1,630	1,007,730
2033	0	35,481	(94,652)	1,366,170	7,010	1,314,009	0	20,854	(37,929)	941,282	1,630	925,837
2034	0	34,973	69,593	1,366,170	7,010	1,477,746	0	20,769	28,588	941,282	1,630	992,269
2035	0	34,313	(242,659)	1,366,170	7,010	1,164,834	0	20,892	(49,219)	941,282	1,630	914,585

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 6 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	Mojave Division (continued)										
	Pearblossom Pumping Plant						Mojave Siphon Powerplant				
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries	
Water Supply				Recreation	Water Supply					Recreation	
[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]
1961	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	21	0	0	0	0	21	0	0	0	0	0
1972	35,243	5,282	(153)	1,794	0	42,166	0	0	0	0	0
1973	80,177	21,522	(2,700)	52,201	72	151,272	0	0	0	0	0
1974	76,694	10,847	(11,149)	102,839	44	179,275	0	0	0	0	0
1975	10,000	2,364	(8,397)	190,351	70	194,388	0	0	0	0	0
1976	4,168	7,040	(16,055)	236,713	152	232,018	0	0	0	0	0
1977	0	11,398	(17,534)	102,326	580	96,770	0	0	0	0	0
1978	19,922	5,695	69,130	374,845	498	470,091	0	0	0	0	0
1979	12,302	6,836	(32,518)	362,114	502	349,236	0	0	0	0	0
1980	0	16,200	6,159	401,214	781	424,354	0	0	0	0	0
1981	0	4,992	(36,278)	574,573	933	544,220	0	0	0	0	0
1982	0	5,251	55,232	401,037	1,919	463,439	0	0	0	0	0
1983	0	11,745	(26,847)	231,188	1,180	217,266	0	0	0	0	0
1984	0	18,228	23,230	252,066	1,494	295,018	0	0	0	0	0
1985	0	25,292	(2,815)	350,758	1,076	374,311	0	0	0	0	0
1986	0	30,876	12,258	394,156	1,508	438,798	0	0	0	0	0
1987	0	27,552	(15,270)	377,531	1,239	391,052	0	0	0	0	0
1988	0	32,209	1,101	501,300	971	535,581	0	1,977	1,101	501,291	971
1989	0	31,500	(20,363)	661,189	1,407	673,733	0	29,110	(20,363)	661,100	1,407
1990	0	32,672	(5,916)	730,560	1,388	758,704	0	23,692	(5,916)	730,550	1,388
1991	0	15,209	34,774	163,913	394	214,290	0	(543)	34,774	163,913	394
1992	0	13,989	(17,451)	338,249	423	335,210	0	(13,193)	(17,451)	338,207	423
1993	0	9,779	(3,455)	255,117	443	261,884	0	(11,922)	(3,455)	255,117	443
1994	0	150	3,395	409,928	430	413,903	0	1,601	3,395	395,294	430
1995	0	6,820	(29,282)	328,882	427	306,847	0	10,458	(29,282)	321,387	427
1996	0	9,514	(11,410)	424,252	565	422,921	0	(5,577)	(11,410)	418,141	565
1997	0	(1,124)	38,960	461,563	507	499,906	0	5,171	38,960	452,525	507
1998	0	(2,087)	16,361	334,965	363	349,602	0	11,496	16,361	332,385	363
1999	0	(1,154)	(8,486)	505,624	396	496,380	0	11,065	(8,486)	498,919	396
2000	0	(23,296)	(10,472)	864,999	449	831,680	0	4,896	(10,472)	854,980	449
2001	0	(9,304)	3,478	635,316	452	629,942	0	7,403	3,478	632,420	452
2002	0	3,810	8,398	823,690	490	836,388	0	9,300	8,398	820,217	490
2003	0	2,814	(20,787)	962,488	355	944,870	0	(6,586)	(20,787)	941,713	355
2004	0	(15,558)	17,207	1,047,521	171	1,049,341	0	5,034	17,207	1,035,315	171
2005	0	(18,967)	(50,014)	1,043,564	84	974,667	0	827	(50,014)	1,025,453	84
2006	0	(21,986)	8,653	1,187,627	98	1,174,392	0	(845)	8,653	1,154,634	98
2007	0	(13,055)	(5,091)	975,802	103	957,759	0	3,060	(5,091)	956,281	103
2008	0	723	5,383	550,143	80	556,329	0	8,380	5,383	534,480	80
2009	0	3,807	(5,619)	431,289	1,100	430,577	0	10,520	(5,619)	411,075	1,100
2010	0	3,489	6,964	886,249	363	897,065	0	11,912	6,964	858,609	363
2011	0	7,953	(1,405)	1,114,267	500	1,121,315	0	13,506	(1,405)	1,080,445	500
2012	0	(9,122)	4,922	942,361	1,430	939,591	0	(12,592)	4,922	942,361	1,430
2013	0	(9,032)	(78)	828,012	1,430	820,332	0	(12,502)	(78)	801,012	1,430
2014	0	(9,031)	(82)	845,909	1,430	838,226	0	(12,501)	(82)	806,127	1,430
2015	0	15,716	22,604	841,374	1,430	881,124	0	12,246	22,604	801,592	1,430
2016	0	15,479	(21,084)	844,474	1,430	840,299	0	12,009	(21,084)	802,892	1,430
2017	0	15,545	33,266	848,074	1,430	898,315	0	12,075	33,266	806,492	1,430
2018	0	15,648	(50,078)	848,074	1,430	815,074	0	12,178	(50,078)	806,492	1,430
2019	0	15,574	31,508	848,074	1,430	896,586	0	12,104	31,508	806,492	1,430
2020	0	15,597	(3,398)	848,074	1,430	861,703	0	12,127	(3,398)	806,492	1,430
2021	0	15,596	(1,117)	848,074	1,430	863,983	0	12,126	(1,117)	806,492	1,430
2022	0	15,590	(3,434)	848,074	1,430	861,660	0	12,120	(3,434)	806,492	1,430
2023	0	15,589	(18,638)	848,074	1,430	846,455	0	12,119	(18,638)	806,492	1,430
2024	0	15,531	21,309	848,074	1,430	886,344	0	12,061	21,309	806,492	1,430
2025	0	15,615	(11,624)	848,074	1,430	853,495	0	12,145	(11,624)	806,492	1,430
2026	0	15,580	13,030	848,074	1,430	878,114	0	12,110	13,030	806,492	1,430
2027	0	15,511	(6,161)	848,074	1,430	858,854	0	12,041	(6,161)	806,492	1,430
2028	0	15,611	4,006	848,074	1,430	869,121	0	12,141	4,006	806,492	1,430
2029	0	15,605	(913)	848,074	1,430	864,196	0	12,135	(913)	806,492	1,430
2030	0	15,580	8,528	848,074	1,430	873,612	0	12,110	8,528	806,492	1,430
2031	0	15,606	(31,057)	848,074	1,430	834,053	0	12,136	(31,057)	806,492	1,430
2032	0	15,515	43,953	848,074	1,430	908,972	0	12,045	43,953	806,492	1,430
2033	0	15,504	(37,929)	848,074	1,430	827,079	0	12,034	(37,929)	806,492	1,430
2034	0	15,419	28,598	848,074	1,430	893,511	0	11,949	28,598	806,492	1,430
2035	0	15,542	(49,219)	848,074	1,430	815,827	0	12,072	(49,219)	806,492	1,430

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 7 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Devil Canyon Powerplant					Santa Ana Division				
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
				Water Supply	Recreation					
[75]	[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	[84]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	37	0	0	1,275	0	1,312	0	0	0	0
1973	40,848	14,745	0	51,812	0	107,405	0	0	0	0
1974	74,666	8,367	(4,925)	102,198	0	180,306	0	0	0	0
1975	10,000	1,995	(6,719)	189,526	0	194,802	0	0	0	0
1976	4,168	5,180	(9,182)	235,711	23	235,900	0	0	0	0
1977	0	8,082	(5,235)	101,137	469	104,453	0	0	0	0
1978	14,820	3,754	21,686	373,636	481	414,377	0	0	0	0
1979	12,302	5,620	(27,107)	356,854	485	348,154	0	0	0	0
1980	0	9,468	12,714	395,975	742	418,899	0	0	0	0
1981	0	8,401	(23,448)	569,088	807	554,848	0	0	0	0
1982	0	6,012	44,469	399,799	1,798	452,078	0	0	0	0
1983	0	8,597	5,188	230,277	1,078	245,140	0	0	0	0
1984	0	12,861	(850)	250,938	1,414	264,363	0	0	0	0
1985	0	14,325	(8,791)	349,336	956	355,826	0	0	0	0
1986	0	9,486	8,339	392,650	1,378	411,853	0	0	0	0
1987	0	7,923	(11,335)	375,451	1,118	373,157	0	0	0	0
1988	0	11,090	2,238	499,285	861	513,474	0	0	0	0
1989	0	13,116	(5,487)	658,730	1,301	667,660	0	0	0	0
1990	0	13,439	(4,622)	728,723	1,281	738,821	0	0	0	0
1991	0	10,836	18,308	161,032	340	190,516	0	0	0	0
1992	0	9,157	(9,084)	328,354	371	328,798	0	0	0	0
1993	0	5,602	5,593	244,678	364	256,237	0	0	0	0
1994	0	10,915	(11,045)	393,690	357	393,917	0	0	0	0
1995	0	11,268	2,331	320,978	358	334,935	0	0	0	0
1996	0	9,496	13,015	417,656	494	440,661	0	0	0	0
1997	0	8,087	(19,685)	451,874	416	440,692	0	0	0	0
1998	0	6,700	16,643	332,198	310	355,851	0	0	0	0
1999	0	9,784	(4,177)	497,787	341	503,735	0	0	0	0
2000	0	7,407	(11,040)	853,786	375	850,528	0	0	0	0
2001	0	9,324	8,183	631,363	374	649,244	0	0	0	0
2002	0	10,315	9,682	818,028	413	838,438	0	0	0	0
2003	0	9,198	(18,298)	922,901	260	914,061	0	4,526	4,526	0
2004	0	11,166	15,150	1,033,309	85	1,059,710	0	3,798	3,798	0
2005	0	4,500	(63,441)	1,010,247	0	951,306	0	3,686	3,686	0
2006	0	8,208	7,571	1,153,993	0	1,169,772	0	7,775	7,775	0
2007	0	8,216	(5,872)	953,803	0	956,147	0	12,168	12,168	0
2008	0	10,599	7,759	533,221	0	551,579	0	14,408	14,408	0
2009	0	10,035	(5,600)	410,032	1,025	415,492	0	20,542	20,542	0
2010	0	6,275	5,344	851,786	307	863,712	0	18,395	18,395	0
2011	0	7,359	2,371	1,066,088	417	1,076,235	0	20,586	20,586	0
2012	0	(8,344)	4,922	940,976	1,250	938,804	0	11,000	11,000	0
2013	0	(8,254)	(78)	792,852	1,250	785,770	0	10,380	10,380	0
2014	0	(8,253)	(82)	796,092	1,250	789,007	0	8,340	8,340	0
2015	0	8,499	2,964	791,432	1,250	804,145	0	8,960	8,960	0
2016	0	8,483	(1,269)	792,052	1,250	800,516	0	9,580	9,580	0
2017	0	8,502	9,828	795,572	1,250	815,152	0	9,100	9,100	0
2018	0	8,484	(19,777)	795,572	1,250	785,529	0	9,100	9,100	0
2019	0	8,492	17,408	795,572	1,250	822,722	0	9,100	9,100	0
2020	0	8,483	(17,305)	795,572	1,250	788,000	0	9,100	9,100	0
2021	0	8,486	(398)	795,572	1,250	804,910	0	9,100	9,100	0
2022	0	8,486	13,735	795,572	1,250	819,043	0	9,100	9,100	0
2023	0	8,482	(8,417)	795,572	1,250	796,887	0	9,100	9,100	0
2024	0	8,462	689	795,572	1,250	805,973	0	9,100	9,100	0
2025	0	8,489	4,591	795,572	1,250	809,902	0	9,100	9,100	0
2026	0	8,475	(3,819)	795,572	1,250	801,478	0	9,100	9,100	0
2027	0	8,479	745	795,572	1,250	806,046	0	9,100	9,100	0
2028	0	8,481	(5,355)	795,572	1,250	799,948	0	9,100	9,100	0
2029	0	8,481	2,909	795,572	1,250	808,212	0	9,100	9,100	0
2030	0	8,480	296	795,572	1,250	805,598	0	9,100	9,100	0
2031	0	8,475	(1,976)	795,572	1,250	803,321	0	9,100	9,100	0
2032	0	8,449	18,821	795,572	1,250	824,092	0	9,100	9,100	0
2033	0	8,449	(23,419)	795,572	1,250	781,852	0	9,100	9,100	0
2034	0	8,443	21,651	795,572	1,250	826,916	0	9,100	9,100	0
2035	0	8,451	(31,434)	795,572	1,250	773,839	0	9,100	9,100	0

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 8 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)													
	Santa Ana Division (continued)								West Branch, California Aqueduct					
	Crafton Hills Pumping Plant				Cherry Valley Pumping Plant				Oso Pumping Plant					
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]	[94]	[95]	[96]	[97]	[98]	
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	2,444	133	0	0	0	2,577
1972	0	0	0	0	0	0	0	0	63,883	6,557	(6,405)	71,991	6,481	142,507
1973	0	0	0	0	0	0	0	0	124,461	16,995	4,029	155,317	1,075	301,877
1974	0	0	0	0	0	0	0	0	160,860	12,702	(4,146)	209,172	2,064	380,652
1975	0	0	0	0	0	0	0	0	93,352	23,008	7,704	374,306	3,288	501,658
1976	0	0	0	0	0	0	0	0	56,954	15,845	(136,116)	420,708	1,429	358,820
1977	0	0	0	0	0	0	0	0	0	4,407	(98,685)	122,447	(20)	28,149
1978	0	0	0	0	0	0	0	0	45,105	9,061	52,774	171,139	176	278,255
1979	0	0	0	0	0	0	0	0	0	25,355	(18,781)	145,598	0	152,172
1980	0	0	0	0	0	0	0	0	0	24,576	(140,168)	165,931	481	50,820
1981	0	0	0	0	0	0	0	0	0	15,254	59,637	283,264	3,179	361,334
1982	0	0	0	0	0	0	0	0	0	23,824	61,685	360,878	2,126	448,513
1983	0	0	0	0	0	0	0	0	0	23,601	(74,308)	166,995	6,111	122,399
1984	0	0	0	0	0	0	0	0	0	12,461	(138,146)	272,101	3,750	150,166
1985	0	0	0	0	0	0	0	0	0	28,257	142,219	403,097	3,728	577,301
1986	0	0	0	0	0	0	0	0	0	22,387	25,288	393,203	1,777	442,655
1987	0	0	0	0	0	0	0	0	0	18,164	(10,252)	433,452	5,698	447,062
1988	0	0	0	0	0	0	0	0	0	20,461	(30,848)	507,169	3,389	500,171
1989	0	0	0	0	0	0	0	0	0	27,914	(40,463)	611,681	6,083	605,215
1990	0	0	0	0	0	0	0	0	0	33,666	(9,176)	791,355	7,491	823,336
1991	0	0	0	0	0	0	0	0	0	16,460	70,754	263,909	4,166	355,289
1992	0	0	0	0	0	0	0	0	0	8,238	(75,008)	435,661	1,572	370,463
1993	0	0	0	0	0	0	0	0	0	2,674	(124,283)	451,263	1,233	330,887
1994	0	0	0	0	0	0	0	0	0	18,688	(91,606)	490,819	2,488	420,389
1995	0	0	0	0	0	0	0	0	0	21,775	14,330	157,629	1,242	194,976
1996	0	0	0	0	0	0	0	0	0	30,121	26,848	286,066	2,363	345,398
1997	0	0	0	0	0	0	0	0	0	30,468	1,892	323,212	1,569	357,141
1998	0	0	0	0	0	0	0	0	0	26,851	(122,848)	208,916	1,222	114,141
1999	0	0	0	0	0	0	0	0	0	25,690	5,679	357,664	2,883	391,916
2000	0	0	0	0	0	0	0	0	0	33,658	18,198	668,126	3,767	723,749
2001	0	0	0	0	0	0	0	0	0	24,551	(22,308)	477,315	759	480,317
2002	0	0	0	0	0	0	0	0	0	44,692	41,944	779,284	3,471	869,391
2003	0	0	2,733	2,733	0	0	116	116	0	39,495	(27,394)	735,699	10,290	758,090
2004	0	0	3,212	3,212	0	0	841	841	0	41,947	(14,046)	850,007	478	878,386
2005	0	0	2,727	2,727	0	0	692	692	0	38,154	(109,664)	577,251	475	506,216
2006	0	0	6,892	6,892	0	0	807	807	0	38,534	(128,775)	616,546	406	526,711
2007	0	0	9,038	9,038	0	0	177	177	0	46,921	123,287	760,750	202	931,160
2008	0	0	13,728	13,728	0	0	1,042	1,042	0	36,204	(9,613)	531,832	247	558,670
2009	0	0	16,463	16,463	0	0	1,898	1,898	0	33,295	4,893	631,969	195	670,352
2010	0	0	17,778	17,778	0	0	5,685	5,685	0	27,788	41,267	412,240	240	481,535
2011	0	0	19,887	19,887	0	0	9,290	9,290	0	29,227	(17,411)	411,366	242	423,424
2012	0	0	11,000	11,000	0	0	11,000	11,000	0	(13,331)	72	547,786	5,380	539,907
2013	0	0	10,380	10,380	0	0	7,620	7,620	0	(13,331)	73	562,388	5,380	554,510
2014	0	0	8,340	8,340	0	0	8,340	8,340	0	(13,331)	74	422,188	5,380	414,311
2015	0	0	8,960	8,960	0	0	8,960	8,960	0	14,646	9,399	424,388	5,380	453,813
2016	0	0	9,580	9,580	0	0	9,580	9,580	0	14,583	(7,317)	424,588	5,380	437,234
2017	0	0	9,100	9,100	0	0	9,100	9,100	0	14,749	28,043	424,888	5,380	473,060
2018	0	0	9,100	9,100	0	0	9,100	9,100	0	14,800	(30,739)	424,888	5,380	414,329
2019	0	0	9,100	9,100	0	0	9,100	9,100	0	14,698	18,671	424,888	5,380	463,637
2020	0	0	9,100	9,100	0	0	9,100	9,100	0	14,739	3,032	424,888	5,380	448,039
2021	0	0	9,100	9,100	0	0	9,100	9,100	0	14,823	11,842	424,888	5,380	456,933
2022	0	0	9,100	9,100	0	0	9,100	9,100	0	14,823	(49)	424,888	5,380	445,042
2023	0	0	9,100	9,100	0	0	9,100	9,100	0	14,815	(333)	424,888	5,380	444,750
2024	0	0	9,100	9,100	0	0	9,100	9,100	0	14,752	(10,020)	424,888	5,380	435,000
2025	0	0	9,100	9,100	0	0	9,100	9,100	0	14,731	(894)	424,888	5,380	444,105
2026	0	0	9,100	9,100	0	0	9,100	9,100	0	14,778	11,278	424,888	5,380	456,324
2027	0	0	9,100	9,100	0	0	9,100	9,100	0	14,760	(11,638)	424,888	5,380	433,390
2028	0	0	9,100	9,100	0	0	9,100	9,100	0	14,800	8,285	424,888	5,380	453,353
2029	0	0	9,100	9,100	0	0	9,100	9,100	0	14,733	(8,133)	424,888	5,380	436,868
2030	0	0	9,100	9,100	0	0	9,100	9,100	0	14,822	12,228	424,888	5,380	457,318
2031	0	0	9,100	9,100	0	0	9,100	9,100	0	14,668	(66,669)	424,888	5,380	378,267
2032	0	0	9,100	9,100	0	0	9,100	9,100	0	14,361	41,046	424,888	5,380	485,675
2033	0	0	9,100	9,100	0	0	9,100	9,100	0	14,577	(56,723)	424,888	5,380	388,122
2034	0	0	9,100	9,100	0	0	9,100	9,100	0	14,154	41,005	424,888	5,380	485,427
2035	0	0	9,100	9,100	0	0	9,100	9,100	0	13,371	(193,440)	424,888	5,380	250,199

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 9 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	West Branch, California Aqueduct (continued)											
	Warne Powerplant						Castaic Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]	[108]	[109]	[110]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	57,364	1,788	(6,162)	71,938	6,481	131,409	
1973	0	0	0	0	0	37,198	6,430	4,542	155,297	1,075	204,542	
1974	0	0	0	0	0	82,364	1,772	(950)	209,136	541	292,863	
1975	0	0	0	0	0	90,460	5,002	(1,534)	374,280	1,563	469,771	
1976	0	0	0	0	0	55,990	(7,695)	(132,036)	420,684	1,429	338,372	
1977	0	0	0	0	0	0	(1,485)	(102,532)	122,447	(20)	18,410	
1978	0	0	0	0	0	45,105	(2,264)	129,523	171,139	176	343,679	
1979	0	0	0	0	0	0	(2,339)	(20,400)	145,598	0	122,859	
1980	0	0	0	0	0	0	991	(118,026)	165,931	481	49,377	
1981	0	0	0	0	0	0	(44,416)	47,244	283,264	2,704	288,796	
1982	0	24,468	61,169	360,878	2,126	448,641	(60,135)	59,069	360,878	1,187	360,999	
1983	0	20,780	(74,308)	166,995	6,111	119,578	(33,418)	(46,904)	166,995	2,618	89,291	
1984	0	13,572	(139,219)	275,212	2,208	151,773	(29,618)	(139,545)	275,212	2,201	108,250	
1985	0	29,286	141,492	403,097	874	574,749	(4,622)	135,007	403,097	844	534,326	
1986	0	21,579	25,288	393,203	1,777	441,847	(6,664)	21,520	393,203	623	408,682	
1987	0	20,885	(10,252)	433,452	5,698	449,783	(519)	(6,241)	433,452	2,734	429,426	
1988	0	23,253	(31,453)	507,169	3,389	502,358	12,650	(28,498)	507,169	1,359	492,680	
1989	0	27,131	(40,463)	611,681	6,083	604,432	634	(40,154)	611,681	3,161	575,322	
1990	0	34,208	(9,176)	791,355	7,491	823,878	(14,012)	(15,101)	786,519	3,419	760,825	
1991	0	16,908	70,754	263,909	4,166	355,737	(871)	89,637	262,921	2,283	353,970	
1992	0	9,638	(75,008)	435,661	1,572	371,863	(609)	(71,795)	435,661	1,543	364,800	
1993	0	1,922	(124,283)	451,257	1,233	330,129	21,959	(77,428)	451,257	1,211	396,999	
1994	0	23,151	(91,606)	490,819	2,488	424,852	5,205	(95,738)	490,819	2,465	402,751	
1995	0	15,860	14,330	157,629	1,242	189,061	20,400	75,863	157,629	1,223	255,115	
1996	0	21,191	26,848	286,066	2,363	336,468	(5,621)	19,088	286,066	2,362	301,895	
1997	0	23,437	1,892	323,201	1,569	350,099	11,119	(1,802)	323,201	1,566	334,084	
1998	0	26,864	(122,848)	208,909	1,222	114,147	24,544	(57,726)	208,909	1,222	176,949	
1999	0	21,822	8,120	357,664	2,883	390,489	(3,670)	6,280	357,664	2,865	363,139	
2000	0	27,237	18,198	668,126	3,767	717,328	(19,645)	9,320	665,926	1,556	657,157	
2001	0	17,404	(22,308)	477,315	759	473,170	0	(5,949)	(16,588)	477,315	746	455,524
2002	0	35,058	41,944	779,284	3,471	859,757	10,071	35,623	776,136	305	822,135	
2003	0	28,167	(27,394)	735,699	10,290	746,762	9,075	(17,034)	725,781	356	718,178	
2004	0	31,034	(14,046)	850,007	478	867,473	9,120	(11,440)	845,960	456	844,096	
2005	0	29,111	(109,664)	577,251	475	497,173	21,155	(61,490)	577,251	472	537,388	
2006	0	23,453	(128,775)	616,546	406	511,630	4,173	(121,607)	616,546	396	499,508	
2007	0	29,978	123,287	760,750	202	914,217	(1,664)	117,880	758,860	196	875,272	
2008	0	36,744	(9,613)	531,832	247	559,210	498	(14,279)	529,852	211	516,282	
2009	0	30,564	4,893	631,969	195	667,621	(2,825)	9,194	628,819	164	635,352	
2010	0	26,930	41,267	412,240	240	480,677	(4,135)	40,284	409,090	207	445,446	
2011	0	29,363	(17,411)	411,366	242	423,560	(9,084)	(22,531)	408,846	221	377,452	
2012	0	(15,241)	72	547,786	5,380	537,997	(9,696)	72	545,896	2,330	538,602	
2013	0	(15,241)	73	562,388	5,380	552,600	(9,696)	73	560,498	2,330	553,205	
2014	0	(15,241)	74	422,188	5,380	412,401	(9,696)	74	420,298	2,330	413,006	
2015	0	12,736	9,399	424,388	5,380	451,903	6,451	9,399	422,498	2,330	440,678	
2016	0	12,673	(7,317)	424,588	5,380	435,324	6,388	(7,317)	422,698	2,330	424,099	
2017	0	12,839	28,043	424,888	5,380	471,150	6,554	28,043	422,998	2,330	459,925	
2018	0	12,890	(30,739)	424,888	5,380	412,419	6,605	(30,739)	422,998	2,330	401,194	
2019	0	12,788	18,671	424,888	5,380	461,727	6,503	18,671	422,998	2,330	450,502	
2020	0	12,829	3,032	424,888	5,380	446,129	6,544	3,032	422,998	2,330	434,904	
2021	0	12,913	11,842	424,888	5,380	455,023	6,628	11,842	422,998	2,330	443,798	
2022	0	12,913	(49)	424,888	5,380	443,132	6,628	(49)	422,998	2,330	431,907	
2023	0	12,905	(333)	424,888	5,380	442,840	6,620	(333)	422,998	2,330	431,615	
2024	0	12,842	(10,020)	424,888	5,380	433,090	6,557	(10,020)	422,998	2,330	421,865	
2025	0	12,821	(894)	424,888	5,380	442,195	6,536	(894)	422,998	2,330	430,970	
2026	0	12,868	11,278	424,888	5,380	454,414	6,583	11,278	422,998	2,330	443,189	
2027	0	12,850	(11,638)	424,888	5,380	431,480	6,565	(11,638)	422,998	2,330	420,255	
2028	0	12,890	8,285	424,888	5,380	451,443	6,605	8,285	422,998	2,330	440,218	
2029	0	12,823	(8,133)	424,888	5,380	434,958	6,538	(8,133)	422,998	2,330	423,733	
2030	0	12,912	12,228	424,888	5,380	455,408	6,627	12,228	422,998	2,330	444,183	
2031	0	12,758	(66,669)	424,888	5,380	376,357	6,473	(66,669)	422,998	2,330	365,132	
2032	0	12,451	41,046	424,888	5,380	483,765	6,166	41,046	422,998	2,330	472,540	
2033	0	12,667	(56,723)	424,888	5,380	386,212	6,382	(56,723)	422,998	2,330	374,987	
2034	0	12,244	41,005	424,888	5,380	483,517	5,959	41,005	422,998	2,330	472,292	
2035	0	11,461	(193,440)	424,888	5,380	248,289	5,176	(193,440)	422,998	2,330	237,064	

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities

(in acre-feet)

Sheet 10 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Coastal Branch, California Aqueduct							
	Las Perillas and Badger Hill Pumping Plants				Devil's Den, Bluestone, and Polonio Pass Pumping Plants			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	210	873	79,039	80,122	0	0	0	0
1969	0	1,042	62,064	63,106	0	0	0	0
1970	0	638	83,649	84,287	0	0	0	0
1971	0	3,455	110,971	114,426	0	0	0	0
1972	0	1,745	121,755	123,500	0	0	0	0
1973	0	5,479	78,645	84,124	0	0	0	0
1974	0	7,344	78,174	85,518	0	0	0	0
1975	0	5,819	85,216	91,035	0	0	0	0
1976	0	6,562	90,058	96,620	0	0	0	0
1977	0	5,777	40,579	46,356	0	0	0	0
1978	0	9,085	92,604	101,689	0	0	0	0
1979	0	10,896	123,155	134,051	0	0	0	0
1980	0	9,449	111,379	120,828	0	0	0	0
1981	0	13,232	109,754	122,986	0	0	0	0
1982	0	7,984	95,776	103,760	0	0	0	0
1983	0	5,710	100,518	106,228	0	0	0	0
1984	0	5,740	126,387	132,127	0	0	0	0
1985	0	7,563	120,823	128,386	0	0	0	0
1986	0	8,719	131,599	140,318	0	0	0	0
1987	0	11,363	128,080	139,443	0	0	0	0
1988	0	12,831	120,969	133,800	0	0	0	0
1989	0	11,454	116,801	128,255	0	0	0	0
1990	0	13,022	109,802	122,824	0	0	0	0
1991	0	5,802	1,496	7,298	0	0	0	0
1992	0	7,893	79,635	87,528	0	0	0	0
1993	0	9,282	94,921	104,203	0	0	0	0
1994	0	8,515	87,158	95,673	0	0	0	0
1995	0	6,986	94,536	101,522	0	0	0	0
1996	0	9,663	114,630	124,293	0	0	0	0
1997	527	8,343	110,428	119,298	527	0	8,538	9,065
1998	0	8,415	109,400	117,815	0	0	22,210	22,210
1999	0	2,453	120,061	122,514	0	303	23,880	24,183
2000	0	(429)	120,313	119,884	0	0	26,703	26,703
2001	0	(742)	87,915	87,173	0	0	23,229	23,229
2002	0	638	99,783	100,421	0	(151)	31,991	31,840
2003	0	161	101,113	101,274	0	284	31,421	31,705
2004	0	492	104,144	104,636	0	480	33,870	34,350
2005	0	1,484	103,178	104,662	0	573	27,595	28,168
2006	0	1,994	115,433	117,427	0	2,034	27,484	29,518
2007	0	3,355	131,590	134,945	0	293	31,516	31,809
2008	0	3,696	107,239	110,935	0	(30)	21,795	21,765
2009	0	2,242	102,509	104,751	0	(3,078)	19,253	16,175
2010	0	4,050	106,590	110,640	0	272	21,532	21,804
2011	0	3,994	114,089	118,083	0	533	24,869	25,402
2012	0	802	113,810	114,612	0	212	45,062	45,274
2013	0	802	99,108	99,910	0	212	39,665	39,877
2014	0	802	90,358	91,160	0	212	30,915	31,127
2015	0	802	90,358	91,160	0	212	30,915	31,127
2016	0	802	90,358	91,160	0	212	30,915	31,127
2017	0	802	90,358	91,160	0	212	30,915	31,127
2018	0	802	90,358	91,160	0	212	30,915	31,127
2019	0	802	90,358	91,160	0	212	30,915	31,127
2020	0	802	90,358	91,160	0	212	30,915	31,127
2021	0	802	90,358	91,160	0	212	30,915	31,127
2022	0	802	90,358	91,160	0	212	30,915	31,127
2023	0	802	90,358	91,160	0	212	30,915	31,127
2024	0	802	90,358	91,160	0	212	30,915	31,127
2025	0	802	90,358	91,160	0	212	30,915	31,127
2026	0	802	90,358	91,160	0	212	30,915	31,127
2027	0	802	90,358	91,160	0	212	30,915	31,127
2028	0	802	90,358	91,160	0	212	30,915	31,127
2029	0	802	90,358	91,160	0	212	30,915	31,127
2030	0	802	90,358	91,160	0	212	30,915	31,127
2031	0	802	90,358	91,160	0	212	30,915	31,127
2032	0	802	90,358	91,160	0	212	30,915	31,127
2033	0	802	90,358	91,160	0	212	30,915	31,127
2034	0	802	90,358	91,160	0	212	30,915	31,127
2035	0	802	90,358	91,160	0	212	30,915	31,127

TABLE B-7 Reconciliation of Capital Costs Allocated to Water Supply and Power Generation (Thousands of Dollars)

Item	Project Costs Allocated to Water Supply and Power Generation							Capital Costs Allocated to Other Purposes	Total SWP Capital Cost
	Miscellaneous Income Credited to Construction ^a	Allowance for Future Price Escalation ^b	Costs of Construction of Delivery Structures ^c	Costs of Requested Excess Capacity and Future Enlargement ^d	Capital Cost Component of Delta Water Charge ^e	Capital Cost Component of Transportation Water Charge ^f	Water Supply and Power Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
CONSERVATION FACILITIES									
Upper Feather Division									
Frenchman Dam & Lake	180	0	0	0	601,50837	0	782	2,876	3,658
Grizzly Valley Dam & Lake Davis	65	0	0	0	54,24949	0	119	8,872	8,991
Antelope Dam & Lake	1	0	0	0	0	0	1	5,863	5,864
Abbey Bridge Dam & Reservoir	0	0	0	0	0	0	0	520	520
Dixie Refuge Dam & Reservoir	0	0	0	0	0	0	0	236	236
Total, Upper Feather Division	246	0	0	0	656	0	902	18,368	19,269
Oroville Division									
Multipurpose Facilities	28,851	0	0	0	434,470	0	463,321	98,278	561,598
Specific Power Facilities	230	0	0	0	107,159	0	107,389	(1,001)	106,388
Total, Oroville Division	29,081	0	0	0	541,629	0	570,710	97,277	667,986
California Aqueduct									
North San Joaquin Division	1,210	0	0	0	81,740	0	82,950	3,359	86,309
San Luis Division	13,152	0	0	0	105,738	0	118,890	4,624	123,514
Total, California Aqueduct	14,362	0	0	0	187,478	0	201,840	7,983	209,823
Delta Facilities	37,311	0	0	0	337,061	0	374,372	18,722	393,094
Planning and Pre-Operation	5,302	0	0	0	59,602	0	64,904	0	64,904
TOTAL, CONSERVATION FACILITIES	86,302	0	0	0	1,126,426	0	1,212,728	142,349	1,355,077
TRANSPORTATION FACILITIES									
Upper Feather Division									
Grizzly Valley Pipeline	(1)	0	317	0	0	344	660	0	660
North Bay Aqueduct	400,771	0	676	0	0	114,509	515,956	0	515,956
South Bay Aqueduct	179,285	0	3,599	0	0	157,963	340,847	23,457	364,304
California Aqueduct									
North San Joaquin Division	13,643	0	108	0	0	206,368	220,119	7,476	227,595
San Luis Division	9,016	0	0	0	0	148,007	157,023	8,451	165,474
South San Joaquin Division	3,402	0	4,491	2,093	0	297,722	307,708	17,782	325,490
Tehachapi Division	(149)	0	0	5,230	0	348,542	353,623	21,008	374,631
Mojave Division	(2,742)	0	1,783	0	0	329,575	328,616	40,407	369,023
Santa Ana Division	(11,254)	0	6,039	5,331	0	423,889	424,005	43,936	467,941
West Branch	39,942	0	461	37	0	491,546	531,986	32,697	564,683
Coastal Branch	(260)	0	176	0	0	511,083	510,999	0	510,999
Total, California Aqueduct	51,598	0	13,058	12,691	0	2,756,731	2,834,078	171,758	3,005,836
TOTAL, TRANSPORTATION FACILITIES	631,653	0	17,650	12,691	0	3,029,547	3,691,541	195,215	3,886,756
East Branch Enlargement	0	0	0	0	0	896,532	896,532	0	896,532
East Branch Extension	0	0	0	0	0	378,615	378,615	0	378,615
Coastal Power Allocation	0	0	0	0	0	30,708	30,708	0	30,708
Agricultural Drainage Facilities	0	0	0	0	0	0	0	91,307	91,307
Off-Aqueduct Power Generation Facilities	0	0	0	0	0	488,720	488,720	0	488,720
Small Hydro Power Generation Facilities	0	0	0	0	14,095	85,681	99,776	0	99,776
Land Purchase - Kern Water Bank	0	0	0	0	34,686	0	34,686	0	34,686
Unassigned / Miscellaneous	0	0	0	0	0	0	0	84,610	84,610
Davis-Grunsky	0	0	0	0	0	0	0	130,000	130,000
TOTAL THROUGH 2020	717,955	0	17,650	12,691	1,175,207	4,909,803	6,833,306	643,481	7,476,787

^a Miscellaneous project receipts that are applied for accounting purposes to reduce the capital costs of the particular facilities.

^b These allowances are included for planning the future financial program, but not for determining current water charges.

^c See Table B-8.

^d See Table B-9.

^e See Table B-13.

^f See Table B-10. Mojave Division total reduced by \$85,681,000 for costs included in "Small Hydro Power Generation Facilities" line.

TABLE B-8 SWP Capital Costs of Requested Delivery Structures

(in dollars)

Project Service Area and Water Supply Contractors	Calendar Year Capital Costs (a)						Total
	1952-2009	2010	2011	2012	2013	2014	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
FEATHER RIVER AREA							
County of Butte	232,297	26,618	3,064	2,000	0	0	263,979
Plumas County Flood Control and Water Conservation District	8,723	0	0	0	0	0	8,723
Thermalito Irrigation District (b)	43,939	0	0	0	0	0	43,939
Subtotal	284,959	26,618	3,064	2,000	0	0	316,641
NORTH BAY AREA							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	662,113	0	0	0	0	0	662,113
Subtotal	675,703	0	0	0	0	0	675,703
SOUTH BAY AREA							
Alameda County Flood Control and Water Conservation District, Zone 7 (d)	415,483	0	1,112,422	352,717	0	0	1,880,622
Alameda County Water District (d)	239,579	0	373,997	17,000	0	0	630,576
Santa Clara Valley Water District	21,500	0	0	0	0	0	21,500
San Francisco Water Department (b)	1,066,680	0	0	0	0	0	1,066,680
Subtotal	1,743,242	0	1,486,419	369,717	0	0	3,599,378
CENTRAL COASTAL AREA							
San Luis Obispo County Flood Control and Water Conservation District	26,204	0	0	0	0	0	26,204
Santa Barbara County Flood Control and Water Conservation District	67,058	0	0	0	0	0	67,058
Subtotal	93,262	0	0	0	0	0	93,262
SAN JOAQUIN VALLEY AREA							
Castaic Lake Water Agency	82,567	0	0	0	0	0	82,567
County of Kings	0	17,206	0	30,000	10,000	0	57,206
Dudley Ridge Water District	304,541	0	0	0	0	0	304,541
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District (c)	5,292	0	0	0	0	0	5,292
Kern County Water Agency	3,277,680	7,030	160,734	250,000	150,000	0	3,845,444
Oak Flat Water District	97,643	0	0	0	0	0	97,643
Tracy Golf and Country Club (c)	6,932	0	0	0	0	0	6,932
Tulare Lake Basin Water Storage District	277,483	0	0	0	0	0	277,483
Veterans Administration Cemetery (b)	3,342	0	0	0	0	0	3,342
Subtotal	4,061,838	24,236	160,734	280,000	160,000	0	4,686,808
SOUTHERN CALIFORNIA AREA							
Antelope Valley-East Kern Water Agency	556,140	81,990	298,649	250,000	150,000	0	1,336,779
Castaic Lake Water Agency	375,593	0	0	0	0	0	375,593
Coachella Valley Water District	14,206	0	0	0	0	0	14,206
Crestline-Lake Arrowhead Water Agency	25,298	0	0	0	0	0	25,298
Desert Water Agency	23,438	0	0	0	0	0	23,438
Littlerock Creek Irrigation District	23,732	0	0	0	0	0	23,732
Mojave Water Agency	220,075	18,818	56,722	30,000	0	0	325,615
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	960,685	0	0	0	0	0	960,685
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Geronio Pass Water Agency	102,175	14,565	1,818	15,000	0	0	133,558
The Metropolitan Water District of Southern California	4,814,078	0	0	0	0	0	4,814,078
Ventura County Flood Control District	79,699	0	0	0	0	0	79,699
Subtotal	7,360,344	115,373	357,189	295,000	150,000	0	8,277,906
TOTAL	14,219,348	166,227	2,007,406	946,717	310,000	0	17,649,698

- (a) Approximate only, not to be construed as invoice amounts.
- (b) Not a SWP water supply contractor.
- (c) Not a SWP water supply contractor, but has contracted for water.
- (d) South Bay Aqueduct Enlargement and Improvement projected costs for 2012.

TABLE B-9 Capital Costs of Requested Excess Peaking Capacity

(in dollars unless otherwise indicated)

Sheet 1 of 2

Calendar Year	Total Advance Payments and Credits for Excess Capacity	Total Incremental Costs for Excess Capacity	Over payment (+) or Under payment (-) (a)	Annual Surplus Money Investment Fund Interest Rate (b)		Net Over or Underpayment With Interest (c)
				Jan-Jun	Jul-Dec	
	[1]	[2]	[3]	[4]	[5]	[6]
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA						
1965	0	158,000	(158,000)	3.968%	4.184%	(163,412)
1966	8,056,000	435,800	7,620,200	4.540%	5.057%	7,701,103
1967	9,094,963	1,878,270	7,216,693	4.815%	4.744%	15,524,533
1968	1,523,252	2,887,351	(1,364,099)	5.330%	5.540%	14,959,187
1969	8,310,651	3,059,310	5,251,341	5.946%	6.389%	21,369,973
1970	3,426,736	2,397,102	1,029,634	7.071%	7.125%	23,986,083
1971	1,086,045	1,146,648	(60,603)	5.154%	5.580%	25,238,017
1972	(4,244,807)	487,394	(4,732,201)	4.477%	4.977%	21,532,965
1973	(15,913,829)	25,041	(15,938,870)	6.023%	8.717%	6,014,116
1974	0	37,775	(37,775)	9.222%	10.351%	6,576,393
1975	0	2,085	(2,085)	7.089%	6.791%	7,038,515
1976	0	0	0	6.048%	6.021%	7,469,662
1977	0	0	0	5.788%	6.182%	7,923,403
1978	0	0	0	7.171%	8.096%	8,539,736
1979	0	0	0	8.979%	9.671%	9,354,605
1980	0	0	0	11.500%	11.500%	10,461,314
Total	11,339,011	12,514,776	(1,175,765)	-	-	10,461,314
SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT						
1967	0	25,730	(25,730)	4.815%	4.744%	(26,611)
1968	184,422	44,053	140,369	5.330%	5.540%	117,587
1969	49,052	38,075	10,977	5.946%	6.389%	136,751
1970	44,911	17,959	26,952	7.071%	7.125%	175,186
1971	61,588	5,900	55,688	5.154%	5.580%	242,927
1972	(20,263)	6,835	(27,098)	4.477%	4.977%	226,230
1973	(180,465)	0	(180,465)	6.023%	8.717%	49,198
1974	0	0	0	9.222%	10.351%	54,130
1975	0	0	0	7.089%	6.791%	57,952
1976	0	0	0	6.048%	6.021%	61,501
1977	0	0	0	5.788%	6.182%	65,237
1978	0	0	0	7.171%	8.096%	70,312
1979	0	0	0	8.979%	9.671%	77,021
1980	0	0	0	11.500%	11.500%	86,133
Total	139,245	138,552	693	-	-	86,133
ANTELOPE VALLEY-EAST KERN WATER AGENCY						
1968	85,495	1,645	83,850	5.330%	5.540%	86,962
1969	52,625	6,326	46,299	5.946%	6.389%	140,964
1970	101,648	15,076	86,572	7.071%	7.125%	243,222
1971	34,062	11,748	22,314	5.154%	5.580%	279,673
1972	(12,794)	2,018	(14,812)	4.477%	4.977%	277,552
1973	(205,354)	308	(205,662)	6.023%	8.717%	77,288
1974	0	96	(96)	9.222%	10.351%	84,933
1975	0	0	0	7.089%	6.791%	90,929
1976	0	190	(190)	6.048%	6.021%	96,300
1977	0	0	0	5.788%	6.182%	102,150
1978	0	0	0	7.171%	8.096%	110,096
1979	0	0	0	8.979%	9.671%	120,601
1980	0	0	0	11.500%	11.500%	134,869
Total	55,682	37,407	18,275	-	-	134,869

(a) Overpayment or underpayment for each calendar year - column (1) minus column (2).
 (b) Interest rates shown are annual rates. Interest is credited daily at applicable rates on funds deposited in the State's Surplus Money Investment Fund.
 (c) Amounts shown are end-of-year balances. Interest on overpayments is credited at applicable Surplus Money Investment Fund Interest Rates Shown in columns (4) and (5). Interest on underpayments is charged at the 1980 Project Interest Rate of 4.584 percent.

TABLE B-9 Capital Costs of Requested Excess Peaking Capacity

(in dollars)

Sheet 2 of 2

Reach Number	ANNUAL REQUIRED ADVANCE OF FUNDS													Reach Total
	Incremental Costs and Advance Payments by Calendar Year													
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1981	
	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA														
<i>Incremental Costs</i>														
8C		1,000	1,000											2,000
8D		43,500	43,500											87,000
9		27,000	27,000	13,500										67,500
10A		29,700	29,700	14,800										74,200
11B	10,100	18,300	18,300	9,200										55,900
12D	1,800		19,300	25,800	12,900									59,800
12E	1,800		12,400	18,800	10,800									43,800
13B			12,600	37,800	31,600									82,000
14A	2,500	500	11,100	80,216	107,504	124,069	37,519	6,413	381	87				370,289
14B	1,200	1,800		19,100	19,100	12,800								54,000
14C	1,800	900		13,500	13,500	9,000								38,700
15A	700		14,000	66,947	133,357	128,099	54,821	5,327	946	2,076				406,273
16A	700		18,900	137,894	182,000	211,608	133,927	26,203	5,767	6,156				723,155
17E		51,500	444,600	537,247	860,024	998,985	699,281	193,286	17,947	29,456	2,085			3,834,411
17F	109,100	261,600	261,600	261,600	261,600	239,500								1,395,000
25			964,270	1,650,947	1,426,925	673,041	221,100	256,165						5,192,448
28J		304,612	13,706	296,668	65,966		230,169	1,209,586	2,017,134	235,900	4,900			4,378,641
Total	129,700	740,412	1,891,976	3,184,019	3,125,276	2,627,271	2,356,234	2,504,528	260,941	42,675	2,085			16,865,117
<i>Current Adjustment</i>														
8C through 25	1. Advance Payments Applied to Incremental Costs Amendment 2 (d)	0	8,056,000	9,094,963	1,523,252	8,310,651	3,426,736	1,086,045	(4,244,807)	(14,381,396)			(356,668)	12,514,776
28J	2. Interest Credits-Amendment 2 (e)								(1,532,433)				(10,104,646)	(11,637,079)
	3. Advance Payments Applied to Incremental Costs Amendment 5 (f)	0	1,240,000	1,483,180	2,469,325	(927,035)	1,729,160	3,215,258	2,967,475	1,690,000	(9,488,722)			4,378,641
	4. Interest Credits-Amendment 5 (g)										(2,721,803)			(2,721,803)
	5. Net Required Advance of Funds	0	9,296,000	10,578,143	3,992,577	7,383,616	5,155,896	4,301,303	(1,277,332)	(14,233,829)	(12,210,525)		(h)	2,524,535
													(10,461,314)	
SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT														
<i>Incremental Costs</i>														
25			25,730	44,053	38,075	17,959	5,900	6,835						138,552
			25,730	44,053	38,075	17,959	5,900	6,835						138,552
<i>Current Adjustments</i>														
	1. Advance Payments Applied to Incremental Costs (d)		0	184,422	49,052	44,911	61,588	(20,263)	(174,133)				(7,025)	138,552
	2. Interest Credit												(6,332)	(79,108)
	3. Net Required Advance of Funds		0	184,422	49,052	44,911	61,588	(20,263)	(180,465)				(h)	53,112
													(86,133)	
ANTELOPE VALLEY-EAST KERN WATER AGENCY														
<i>Incremental Costs</i>														
29A				1,645	6,326	13,376	10,048	2,018	308	96			190	34,007
29F						1,700	1,700							3,400
				1,645	6,326	15,076	11,748	2,018	308	96			190	37,407
<i>Current Adjustment</i>														
	1. Advance Payments Applied to Incremental Costs (d)			85,495	52,625	101,648	34,062	(12,794)	(189,120)	0		0	(34,509)	37,407
	2. Interest Credit								(16,234)				(100,360)	(116,594)
	3. Net Required Advance of Funds			85,495	52,625	101,648	34,062	(12,794)	(205,354)	0		0	(h)	(79,187)
													(134,869)	

(d) Actual payments are shown for 1965 through 1976 with 1981 adjusted to reflect overpayments and underpayments without interest for prior years.

(e) Interest for overpayments and underpayments under provisions of Amendment 2 of the contract.

(f) Actual payments are shown for 1965 through 1973 with 1974 adjusted to reflect overpayments and underpayments without interest for prior years.

(g) Interest for overpayments and underpayments under provisions of Amendment 5 of the contract.

(h) Amounts in excess of incremental costs, under the provisions of the contract, reduce the Transportation Charge capital cost component of the Agency's Statement of Charges for January 1981.

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 1 of 8

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	0	0	0	97	34	30	57
1953	0	0	0	0	0	0	477	166	144	297
1954	0	0	0	0	0	0	1,466	508	437	959
1955	0	0	0	0	0	0	1,944	674	560	1,266
1956	0	0	0	0	0	0	18,789	6,515	5,090	12,545
1957	0	13,290	3,391	0	9,953	26,634	45,080	15,639	12,285	33,218
1958	2	19,202	5,011	0	25,798	50,011	195,985	80,961	7,714	21,930
1959	14	7,517	2,118	0	17,653	27,288	496,140	148,516	24,945	17,118
1960	28	8,797	4,292	0	4,838	17,927	1,130,378	67,351	71,779	68,028
1961	10	1,551	10,318	0	2,526	14,395	3,273,247	180,596	307,885	74,398
1962	32	217	(1,751)	0	414	(1,120)	1,548,884	203,535	695,446	35,102
1963	51	2,510	(1,063)	0	983	2,430	480,716	69,182	2,284,291	206,587
1964	7,791	39,879	12,046	0	21,934	73,859	2,549,118	15,903	181,900	264,410
1965	3,139	72,793	17,900	0	170,361	261,054	807,505	153,454	85,425	447,830
1966	(48)	59,615	12,972	0	438,949	511,536	898,074	149,529	142,096	1,690,200
1967	47	47,257	11,597	0	1,551,023	1,609,877	607,614	50,423	293,304	3,496,284
1968	51,573	70,586	19,560	0	831,158	921,304	565,119	19,543	89,300	2,931,101
1969	234,232	63,650	23,628	0	46,428	133,706	455,173	9,618	3,860	896,727
1970	16,227	59,090	42,733	0	9,415	111,238	52,481	3,380	10,517	154,358
1971	27,204	20,819	31,516	0	8,480	60,815	24,505	4,645	5,035	20,395
1972	9	15,538	12,952	0	10,058	38,548	26,918	825	2,945	26,090
1973	25	18,488	29,018	0	39,878	87,384	24,468	4,010	6,016	12,708
1974	45	67,352	29,978	0	134,332	231,662	17,108	1,192	1,765	65,587
1975	21	62,855	73,112	0	45,091	181,058	57,619	561	1,165	7,291
1976	51	52,419	75,611	218	13,168	141,416	104,242	2,846	8,915	12,701
1977	28	53,274	65,662	2,240	23,138	144,314	176,062	3,625	3,225	16,158
1978	38	61,936	57,158	2,955	28,987	151,036	264,581	4,494	3,668	14,028
1979	23	316,620	91,367	3,953	62,240	474,180	111,106	17,151	8,515	31,725
1980	26	422,804	111,600	19,910	96,125	650,439	368,942	17,708	8,249	38,045
1981	34	430,992	147,295	(10,752)	43,157	610,692	(145,428)	3,600	6,533	12,448
1982	11	934,812	357,720	(7,165)	134,408	1,419,775	(44,778)	18,971	7,451	37,824
1983	19	1,091,091	1,076,627	2,628	517,615	2,687,961	429,225	73,925	38,185	72,415
1984	26	1,875,968	2,317,661	3,290	1,068,363	5,265,282	506,951	36,354	9,610	92,846
1985	29	2,248,491	7,849,886	27,815	3,416,370	13,542,562	34,103	2,822	5,034	27,138
1986	31	16,420,238	10,020,277	1,309,599	1,819,349	29,569,463	85,732	14,715	17,144	13,982
1987	32	11,873,826	7,214,307	1,628,932	1,670,596	22,387,661	126,377	15,693	27,881	32,931
1988	55	3,287,756	1,648,431	1,015,971	686,821	6,638,979	290,505	36,744	51,786	25,078
1989	44	1,056,583	950,985	224,567	374,886	2,607,021	130,609	16,848	35,518	12,582
1990	63	493,522	537,881	145,694	71,938	1,249,035	275,732	32,387	99,251	40,263
1991	54	76,599	17,130	24,846	70,542	189,117	1,153,109	26,900	53,613	21,889
1992	42	56,492	6,525	18,333	37,778	119,128	401,906	53,036	61,799	51,386
1993	30	104,317	24,579	40,129	82,032	251,057	313,476	55,679	79,149	39,293
1994	14	68,065	13,463	27,107	45,909	154,544	(211,712)	29,017	362,585	36,350
1995	3	26,002	5,920	7,337	20,617	59,876	265,751	42,516	48,189	21,436
1996	0	14,790	3,334	6,614	14,606	39,344	139,573	13,049	25,751	10,677
1997	3	67,264	35,545	38,585	(13,571)	127,623	203,476	31,135	36,986	16,906
1998	7	15,410	6,392	6,797	10,396	38,995	67,974	6,120	14,731	4,616
1999	2	71,950	35,515	33,879	32,613	173,957	162,161	25,329	35,716	24,347
2000	24	29,992	8,327	11,710	4,156	54,185	100,654	15,688	24,144	19,652
2001	20	10,597	3,904	3,892	1,954	20,347	436,756	4,272	118,836	4,207
2002	14	27,018	18,971	15,254	4,614	65,857	3,068,535	5,648	329,244	64,425
2003	0	14,733	9,243	4,658	46,313	74,947	4,465,569	200,125	199,457	360,387
2004	0	23,929	2,214	2,341	145,290	173,774	1,257,335	120,340	131,702	99,547
2005	0	89,369	216	9	33,947	123,541	1,224,486	119,298	260,893	(81)
2006	5	28,336	298	145	879,439	908,218	2,840,723	68,417	259,635	572
2007	0	61,402	40	35	3,219,048	3,280,525	3,069,791	15,211	70,835	1,915
2008	4	75,166	6,097	5,347	7,878,430	7,965,040	5,592,562	35,913	169,940	5,124
2009	13	27,617	866	463	1,188,847	1,217,793	9,803,255	1,029,805	1,545,796	2,406
2010	0	5,236	259	240	395,413	401,148	6,234,944	104,404	441,736	14,866,232
2011	1	11,210	5,672	5,037	149,646	171,565	9,878,571	1,578,705	3,734,755	3,419,894
2012	352	159,231	18,227	30,686	58,204	266,348	5,257,399	208,774	2,712,448	160,782
2013	303	375,966	11,591	3,161	178,387	569,105	353,676	60,056	234,888	24,138
2014	303	5,431,333	8,052	0	207,760	5,647,145	203,634	44,160	175,964	17,889
2015	303	201,027	8,052	0	96,066	305,145	138,010	29,368	116,796	14,162
2016	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2017	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2018	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2019	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2020	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2021	303	19,206	8,052	0	7,887	35,145	12,729	1,128	3,837	7,045
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	344,227	48,459,625	33,160,540	4,656,460	28,232,191	114,508,816	72,890,864	5,414,376	15,833,509	30,295,071

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 2 of 8

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1952	8	66	72	132	496	4,012	3,279	1,499	8,790
1953	38	327	336	640	2,425	10,559	8,589	3,964	23,112
1954	123	1,005	1,003	1,954	7,455	13,796	11,163	5,179	30,138
1955	160	1,293	1,149	2,454	9,500	7,370	5,952	2,760	16,082
1956	1,559	11,959	11,043	28,372	95,872	9,880	5,020	2,398	17,298
1957	3,659	29,675	27,385	553,114	729,065	11,953	5,456	2,612	20,021
1958	2,243	17,872	17,385	560,904	904,994	18,585	17,191	7,994	43,770
1959	357	3,200	3,568	149,874	843,718	123,170	100,306	45,510	268,986
1960	1,102	2,944	4,498	359,749	1,705,829	191,408	102,136	48,968	342,512
1961	4,726	18,325	22,765	(1,367)	3,880,575	153,765	195,947	42,843	392,555
1962	17,295	160,939	178,242	209,042	3,048,485	612,258	491,225	168,218	1,271,701
1963	265,414	1,250,386	939,832	129,902	5,626,310	1,993,284	1,525,734	684,095	4,203,113
1964	100,603	1,716,371	2,327,770	2,947,522	10,103,597	4,674,280	2,369,858	700,074	7,744,212
1965	42,345	368,476	637,266	1,921,844	4,464,145	5,877,189	6,873,699	2,975,719	15,726,607
1966	17,663	34,915	140,350	777,887	3,850,714	8,553,362	14,112,820	5,677,099	28,343,281
1967	(41,567)	137,856	147,183	379,764	5,070,861	9,678,607	10,672,113	6,646,739	26,997,459
1968	84,553	2,130	68,057	253,152	4,412,955	6,392,664	891,681	1,303,186	8,587,531
1969	4,279	11,572	162,300	32,000	1,575,529	3,542,767	792,259	443,924	4,778,950
1970	2,487	6,820	20,086	(15,718)	234,411	2,236,607	149,692	115,578	2,501,877
1971	4,350	6,923	17,750	39,084	122,687	98,138	215,512	69,410	383,060
1972	1,084	203	4,800	32,199	95,064	159,608	43,721	7,744	211,073
1973	288	989	7,449	9,693	65,621	105,581	25,496	22,418	153,495
1974	527	6,020	30,628	11,433	134,260	177,700	16,627	45,707	240,034
1975	126	679	1,086	3,464	7,991	239,144	14,680	169,676	423,500
1976	701	3,529	8,362	26,186	167,482	641,860	45,533	65,943	753,336
1977	270	1,310	8,651	24,938	234,239	274,381	20,283	22,568	317,232
1978	231	1,204	1,631	17,123	306,960	801,265	36,221	9,714	847,200
1979	1,367	1,721	2,134	7,322	181,041	1,051,792	59,695	26,106	1,137,593
1980	1,321	1,718	2,182	7,102	445,267	4,173,603	96,760	38,789	4,309,152
1981	308	1,462	1,398	5,077	(114,602)	(502,921)	1,487,516	38,451	1,023,046
1982	716	1,561	1,746	6,074	29,565	700,738	46,501	22,308	769,547
1983	407	5,721	8,143	23,367	651,388	706,104	84,435	211,619	1,002,158
1984	269	1,853	1,667	13,301	662,851	1,559,539	41,352	48,478	1,649,369
1985	402	1,657	2,129	6,750	80,035	677,955	24,812	19,404	722,171
1986	1,119	2,744	3,313	12,234	150,983	398,788	63,830	35,420	498,038
1987	1,496	3,081	3,560	21,842	232,861	799,672	88,945	41,659	930,276
1988	5,706	6,689	7,603	33,728	457,839	2,898,156	(128,051)	(56,448)	2,713,657
1989	2,641	3,878	4,755	14,489	221,320	6,898,872	346,589	173,993	7,419,454
1990	5,092	19,899	36,584	87,796	597,004	13,483,785	112,002	2,446,232	16,042,019
1991	1,942	5,059	7,357	31,682	1,301,551	13,914,632	133,121	114,981	14,162,734
1992	1,184	2,042	2,250	35,464	609,067	6,260,482	241,456	239,437	6,741,375
1993	3,618	6,028	8,873	42,200	548,316	2,542,869	257,330	200,072	3,000,271
1994	2,897	4,781	5,346	89,991	319,255	1,145,666	148,396	88,357	1,382,419
1995	11,556	3,635	14,769	24,750	432,602	1,462,211	217,940	131,995	1,812,146
1996	3,092	2,271	2,699	12,522	209,634	874,227	74,153	41,215	989,595
1997	1,454	4,141	3,655	20,589	318,342	2,064,446	146,851	84,303	2,295,600
1998	363	1,134	(6,005)	5,776	94,709	729,475	33,695	16,670	779,840
1999	1,533	3,304	12,727	31,634	296,751	2,208,776	88,951	90,639	2,388,366
2000	2,406	4,944	5,331	10,755	183,574	(706,517)	57,503	40,185	(608,829)
2001	91,721	68,849	404,226	1,190,653	2,319,520	371,407	91,792	8,926	472,125
2002	229,409	453,259	1,107,580	2,977,939	8,236,039	388,781	44,543	22,639	455,963
2003	67,216	509,964	477,926	1,409,228	7,689,872	178,162	22,779	13,565	214,506
2004	3,193	3,100	39,326	3,276,907	4,931,450	892,410	15,333	77,640	985,383
2005	5,341	5,271	4,848	731,512	2,351,568	294,112	40,135	98,505	432,752
2006	1,298	1,355	1,364	15,425	3,188,789	315,146	15,229	178,089	508,464
2007	7,478	7,479	7,478	10,751	3,190,938	298,687	58,266	122,056	479,009
2008	8,421	8,737	8,938	12,436	5,842,071	767,885	39,837	85,661	893,383
2009	3,153	3,389	3,470	5,076	12,396,350	424,939	42,671	30,960	498,570
2010	786	792	782	1,186	21,650,862	96,910	9,126	2,869	108,905
2011	1,967	3,317	1,955	4,056	18,623,220	203,817	64,980	12,400	281,197
2012	262,791	449,045	220,552	309,648	9,581,439	2,363,361	170,763	347,154	2,881,278
2013	57,582	60,699	61,395	91,780	944,214	11,484,530	260,566	2,897,289	14,642,385
2014	43,521	46,515	47,322	70,704	649,709	3,987,809	247,697	2,203,216	6,438,722
2015	28,729	31,723	32,530	49,457	440,775	332,603	148,105	73,815	554,523
2016	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2017	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2018	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2019	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2020	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2021	489	3,483	4,290	8,895	41,896	66,221	35,295	17,411	118,927
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	1,381,053	5,559,703	7,368,295	19,219,914	157,962,785	132,743,428	43,959,567	29,664,654	206,367,649

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 3 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036
1966	2,312,372	8,527,843	5,765,798	4,230,221	7,708,334	28,544,568	201,274	5,197,322	2,539,278
1967	(44,527)	2,062,305	6,942,522	222,885	6,675,398	15,858,583	212,285	4,982,844	3,363,650
1968	119,884	395,689	973,956	179,917	461,031	64,234	64,234	611,192	940,074
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088
1972	15,990	90,852	17,053	14,621	281,343	419,859	10,818	13,349	16,603
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952
1978	8,539	423,395	7,006	3,536	6,994	454,470	7,584	40,453	17,395
1979	(35,394)	543,225	19,463	9,485	(242,253)	294,526	10,474	6,181	6,227
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706
1981	28,491	(2,244,127)	(44,017)	(15,456)	918,984	(1,356,125)	1,151	9,642	9,541
1982	100,629	(1,616,569)	20,184	10,359	3,525,738	2,040,341	2,469	8,283	6,956
1983	75,639	33,881	11,785	6,638	1,811,638	1,939,581	7,955	13,782	11,090
1984	31,748	87,083	26,712	12,754	3,053,662	3,211,959	26,489	9,959	6,268
1985	53,251	56,732	13,685	6,934	582,910	713,512	7,220	9,762	7,688
1986	73,979	201,509	50,668	19,223	1,282,469	1,627,848	8,902	25,011	20,503
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042
1988	(149,385)	224,154	(406,398)	(137,353)	923,622	454,640	9,833	(119,741)	(60,639)
1989	39,652	594,894	232,852	80,090	575,855	1,523,343	5,279	91,501	278,061
1990	39,270	259,895	79,589	29,606	461,219	869,579	5,814	41,345	2,016,434
1991	4,916,134	397,959	98,847	35,860	511,519	5,960,319	4,588	43,140	41,348
1992	(757,001)	545,729	211,854	74,544	396,398	471,524	3,546	103,695	109,225
1993	110,233	724,929	186,271	70,815	720,283	1,812,531	15,016	101,634	90,929
1994	1,151,976	288,018	63,862	27,812	710,770	2,242,438	6,770	42,455	40,696
1995	285,776	441,479	130,761	58,640	1,914,186	2,830,842	12,548	49,963	43,251
1996	31,942	(110,471)	34,529	12,219	588,712	556,931	6,444	29,863	27,050
1997	73,224	513,793	(277,781)	42,881	5,016,215	5,368,332	11,497	49,111	43,799
1998	19,692	304,115	34,319	16,542	2,819,556	3,194,224	2,562	11,115	6,955
1999	18,187	158,902	100,061	41,691	1,901,382	2,220,223	5,706	25,179	23,510
2000	101,618	373,699	78,036	36,186	1,139,073	1,728,612	3,922	23,591	29,281
2001	(10,513)	(47,112)	519,031	(3,546)	61,595	519,455	2,280	17,030	21,196
2002	12,237	24,434	6,079,343	3,454	(2,453,483)	3,665,985	3,627	44,010	20,221
2003	8,864	79,647	(5,372,495)	7,923	2,183,795	(3,092,266)	2,130	18,793	16,716
2004	(16,126)	(14,365)	(50,563)	(2,487)	(459,225)	(542,766)	22,520	5,980	3,879
2005	261	11,360	129,470	3,529	995,531	1,140,151	26,301	11,593	6,323
2006	1,421	27,658	(10,639)	1,444	(366,505)	(346,621)	6,106	2,942	1,621
2007	2	87,855	39,476	7,718	(120,678)	14,373	13,352	21,920	11,909
2008	14,780	16,097	46,719	13,920	1,110,583	1,202,099	9,017	13,020	7,277
2009	934	216,920	45,727	5,164	(42,304)	226,441	2,380	16,160	8,894
2010	(16)	1,560,454	130,995	655	(347,589)	1,344,499	(1)	1,824	989
2011	57	641,814	479,522	574	76,704	1,198,671	3	1,861	1,017
2012	15,682	1,026,255	1,093,843	35,297	604,767	2,775,844	828	55,805	31,847
2013	13,501	781,875	2,720,980	58,276	4,357,016	7,931,648	713	99,376	55,306
2014	13,501	1,454,411	927,916	57,747	340,209	2,793,784	713	98,402	54,777
2015	13,501	306,802	109,464	35,653	74,060	539,480	713	57,733	32,682
2016	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2017	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2018	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2019	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2020	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2021	13,501	31,422	34,381	10,626	24,004	113,934	713	11,667	7,655
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	20,973,568	37,686,915	29,346,353	6,225,997	53,773,693	148,006,526	950,003	13,531,081	11,387,315

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 4 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1952	695	1,279	1,980	995	1,663	794	212	212	1,911	
1953	2,569	4,790	7,480	3,745	6,236	2,599	733	741	7,016	
1954	2,821	4,855	7,565	3,792	6,319	2,880	810	817	7,073	
1955	1,097	1,557	2,404	1,211	2,025	1,183	325	327	2,253	
1956	4,428	6,223	9,233	4,737	8,054	7,026	1,638	1,584	9,939	
1957	13,269	18,772	28,082	14,615	24,411	15,651	3,834	3,864	26,871	
1958	25,086	48,191	78,564	39,087	61,715	33,726	12,330	11,813	49,499	
1959	25,787	67,246	107,781	53,836	86,478	64,824	22,102	21,828	70,838	
1960	47,492	66,317	77,936	39,867	63,517	84,363	23,260	22,305	73,305	
1961	68,505	46,073	88,274	51,457	28,015	242,753	91,290	65,565	150,205	
1962	57,705	56,056	69,189	44,851	49,179	208,180	61,489	47,608	133,653	
1963	52,585	91,914	173,985	86,405	67,733	425,626	104,436	77,970	102,072	
1964	124,014	333,621	291,013	174,469	86,271	1,093,795	684,005	485,033	571,173	
1965	622,257	1,053,029	1,524,848	1,044,851	196,487	3,385,205	1,655,024	1,436,258	476,830	
1966	2,800,056	3,709,779	673,429	466,228	418,141	4,916,319	974,862	724,354	1,829,852	
1967	3,652,342	4,636,627	1,881,333	1,244,265	1,238,428	2,788,299	525,653	400,183	1,721,304	
1968	1,025,969	1,323,302	4,726,074	3,145,776	8,343,706	10,210,266	1,330,361	1,405,117	7,522,015	
1969	145,111	229,185	706,272	529,080	3,704,065	15,112,041	1,223,457	1,134,395	9,523,012	
1970	74,366	85,151	70,725	72,798	320,797	11,031,255	987,213	738,955	8,836,897	
1971	15,595	45,006	43,988	42,624	339,078	2,925,191	193,255	36,514	3,275,227	
1972	19,736	32,657	43,939	24,748	81,937	1,388,348	101,784	20,165	1,003,380	
1973	14,283	16,448	9,980	16,320	25,090	680,834	19,584	13,469	798,805	
1974	22,111	14,951	19,555	32,240	29,582	524,504	30,735	16,333	778,696	
1975	15,865	13,479	10,793	13,678	25,827	269,197	25,164	21,048	370,265	
1976	76,202	54,217	37,464	59,842	105,332	507,519	59,753	42,776	434,574	
1977	75,628	52,919	22,826	54,444	81,293	301,515	49,972	30,152	235,514	
1978	48,754	16,469	(2,816)	27,331	43,126	348,674	(653)	1,500	297,817	
1979	241	6,906	13,401	14,229	25,411	293,786	9,846	7,856	245,590	
1980	18,165	18,813	15,608	27,498	34,190	1,676,267	29,169	23,023	1,719,775	
1981	10,309	14,885	26,473	20,972	25,515	(1,076,221)	27,551	33,674	(1,142,721)	
1982	8,237	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)	
1983	14,488	9,792	14,174	13,050	35,872	419,650	17,389	24,933	115,983	
1984	7,533	27,613	87,907	49,271	22,732	54,590	75,453	63,060	63,537	
1985	9,215	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782	
1986	22,335	16,664	16,014	25,031	20,483	140,642	25,960	13,913	154,089	
1987	16,704	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047	
1988	(159,357)	(73,648)	(151,040)	(51,401)	(120,104)	161,077	(75,276)	(75,307)	144,369	
1989	70,153	65,216	63,382	120,925	73,037	2,778,880	119,559	36,660	2,952,046	
1990	34,841	29,230	27,269	49,082	34,048	715,031	44,187	14,537	440,017	
1991	36,888	32,195	30,146	55,119	34,144	423,235	50,345	12,116	353,596	
1992	103,321	99,765	98,178	192,455	97,638	991,603	185,311	9,210	387,615	
1993	90,291	70,131	63,247	118,440	80,530	687,462	109,792	38,960	942,211	
1994	65,737	29,221	26,997	50,234	35,154	400,534	44,481	17,426	324,942	
1995	435,909	32,487	25,516	49,885	41,733	524,524	48,740	29,125	450,952	
1996	253,433	19,489	15,020	30,202	29,333	403,125	26,945	16,405	253,622	
1997	73,458	30,890	25,368	48,767	40,900	451,910	47,815	29,878	809,848	
1998	14,618	7,107	5,773	10,697	9,676	288,667	10,799	6,819	119,562	
1999	47,359	17,022	13,362	34,410	31,539	260,623	24,634	14,826	264,538	
2000	43,459	21,186	32,480	40,180	25,119	168,825	15,243	11,006	151,512	
2001	42,731	14,471	22,325	34,995	8,027	71,645	4,537	3,988	66,918	
2002	87,805	19,626	7,157	78,600	47,505	276,160	22,632	34,980	164,596	
2003	22,946	9,280	8,935	18,115	15,308	136,433	6,671	9,686	110,492	
2004	5,493	3,291	4,188	7,001	5,787	52,563	5,588	1,490	50,520	
2005	7,316	6,332	12,579	6,307	6,354	21,617	12,567	44	9,079	
2006	1,872	1,680	3,146	1,618	1,736	5,936	3,109	108	2,695	
2007	13,807	11,909	23,818	11,909	11,910	40,392	23,818	1	16,745	
2008	8,919	6,999	12,960	8,044	8,187	35,363	13,537	568	22,711	
2009	10,504	8,926	16,976	9,236	9,565	35,566	17,158	450	18,753	
2010	1,148	985	1,985	990	981	3,325	1,988	(7)	1,362	
2011	1,177	1,031	2,010	1,016	1,044	3,554	2,002	26	1,530	
2012	36,427	35,771	57,197	31,601	39,487	441,645	54,769	7,193	376,974	
2013	63,695	58,684	105,021	55,094	61,883	740,851	102,930	6,193	101,720	
2014	63,081	58,155	103,963	54,565	61,354	210,977	101,872	6,193	576,248	
2015	37,464	36,060	59,771	32,470	39,260	136,045	57,681	6,193	69,915	
2016	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2017	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2018	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2019	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2020	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2021	8,447	11,033	9,715	7,443	14,233	51,168	7,624	6,193	34,732	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	10,706,732	12,871,544	11,687,804	8,624,938	16,465,890	68,162,078	9,536,994	7,247,111	48,337,411	

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 5 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN (contd.)		TEHACHAPI DIVISION			MOJAVE DIVISION				
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A	
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]		
1952	4,440	16,030	9,703	4,072	13,775	4,090	1,520	0	2,561	
1953	16,513	59,323	31,337	13,284	44,621	12,610	4,685	0	7,246	
1954	16,601	60,328	46,243	20,010	66,253	16,642	6,184	0	9,506	
1955	5,223	19,612	25,880	11,362	37,242	5,612	2,086	0	2,529	
1956	21,754	82,940	47,487	17,609	65,096	6,038	2,244	0	2,440	
1957	62,657	237,073	119,673	49,130	168,803	22,348	8,304	0	9,035	
1958	133,083	537,575	164,056	72,091	236,147	37,917	14,166	123	15,391	
1959	205,748	773,179	151,389	57,883	209,272	38,620	23,450	1,102	23,605	
1960	204,788	774,678	203,222	45,323	248,545	21,356	26,093	5,318	40,523	
1961	206,305	1,148,969	387,819	85,558	473,377	35,664	32,281	2,262	34,918	
1962	171,396	1,127,293	353,119	82,610	435,729	68,508	266,284	1,841	10,323	
1963	481,941	1,913,123	1,191,633	124,757	1,316,390	37,379	435,881	4,137	39,706	
1964	1,778,952	5,834,889	1,866,000	775,005	2,641,005	95,693	706,369	8,564	43,342	
1965	1,268,176	13,733,092	2,574,824	2,284,869	4,859,693	121,060	716,092	9,156	108,519	
1966	2,896,274	27,347,168	5,537,412	9,323,517	14,860,929	366,116	1,644,699	13,373	159,282	
1967	3,442,021	30,089,234	26,239,390	12,398,708	38,638,098	1,312,022	903,880	24,103	645,078	
1968	7,578,498	48,226,583	33,363,479	7,416,464	40,779,943	136,804	7,109,653	71,388	1,889,601	
1969	13,136,056	45,702,910	40,368,425	6,883,206	47,251,631	213,805	2,465,641	7,423	5,939,151	
1970	13,890,751	36,322,845	35,446,706	6,786,231	42,232,937	2,211,077	1,210,665	6,217	3,652,478	
1971	7,903,937	14,885,415	20,141,395	6,835,303	26,976,698	1,496,843	284,738	6,994	1,074,759	
1972	3,025,555	5,783,019	10,002,935	34,791	10,037,726	129,417	409,903	3,620	471,963	
1973	1,472,313	3,096,609	3,090,140	36,207	3,126,347	23,931	75,638	2,539	88,416	
1974	1,031,843	2,546,984	4,798,348	152,494	4,950,842	28,399	205,581	2,703	138,673	
1975	489,545	1,289,211	2,144,178	411,404	2,555,582	44,774	70,652	5,066	68,157	
1976	618,049	2,154,103	1,124,357	174,629	1,298,986	121,043	84,593	6,786	59,967	
1977	580,209	1,673,525	655,047	31,512	686,559	261,400	133,767	7,521	117,878	
1978	582,775	1,428,409	1,900,843	27,956	1,928,799	553,014	57,150	5,872	51,615	
1979	542,554	1,182,702	2,099,385	61,381	2,160,766	626,615	339,536	10,831	37,085	
1980	3,772,498	7,372,362	17,433,610	6,046	17,439,656	1,130,429	1,073,430	3,604	308,188	
1981	(2,527,211)	(4,566,440)	(3,848,206)	6,908	(3,841,298)	1,218,824	845,702	4,498	48,625	
1982	(1,850,736)	(3,296,600)	11,370,112	6,054	11,376,166	6,968,683	746,900	3,920	33,869	
1983	166,232	864,390	8,862,914	8,269	8,871,183	10,909,386	64,660	2,596	40,793	
1984	119,387	613,799	3,227,937	31,701	3,259,638	8,340,371	309,491	3,124	17,508	
1985	82,117	165,866	1,926,289	10,460	1,936,749	5,264,156	227,986	3,885	68,422	
1986	186,348	675,895	1,381,955	33,788	1,415,743	2,049,111	2,069,663	4,261	2,331,707	
1987	194,936	718,184	671,183	13,807	684,990	1,347,722	(6,453)	4,684	562,540	
1988	262,334	(308,900)	1,408,760	(49,734)	1,359,026	847,954	(104,961)	13,409	(159,892)	
1989	5,955,356	12,610,055	504,715	64,660	569,375	376,980	207,150	50,953	31,173	
1990	640,283	4,092,118	783,219	25,218	808,437	202,065	(402,573)	61,192	(637,062)	
1991	774,129	1,890,989	691,578	33,405	724,983	273,021	22,218	81,545	(188,732)	
1992	731,512	3,113,074	741,986	24,369	766,355	620,962	384,568	86,644	225,398	
1993	857,038	3,265,681	1,223,402	35,370	1,258,772	1,131,166	248,287	72,746	110,869	
1994	853,328	1,937,975	806,213	16,681	822,894	998,126	164,096	60,147	51,340	
1995	628,941	2,373,574	1,538,497	19,443	1,557,940	390,433	157,481	45,990	92,925	
1996	388,064	1,498,995	2,571,039	10,797	2,581,836	91,593	69,281	22,188	35,656	
1997	481,458	2,144,699	1,009,249	18,265	1,027,514	135,402	92,607	13,590	65,433	
1998	440,746	937,096	925,574	6,843	932,417	47,486	36,170	4,164	29,900	
1999	361,516	1,124,224	662,144	12,166	674,310	113,232	49,150	5,329	171,935	
2000	372,997	938,801	408,352	14,333	422,685	120,267	90,145	936	83,478	
2001	167,694	477,837	266,815	10,891	277,706	65,580	186,973	2,223	343,775	
2002	286,748	1,093,667	247,986	9,586	257,572	35,787	(139,334)	1,374	(111,675)	
2003	159,978	535,483	189,022	12,339	201,361	84,434	(19,049)	0	(11,367)	
2004	322,068	490,368	372,622	4,637	377,259	19,723	17,430	0	18,763	
2005	43,887	170,299	2,264,602	6,587	2,271,189	27,020	18,910	0	25,134	
2006	11,294	43,863	5,855,349	2,353	5,857,702	7,062	4,978	0	6,373	
2007	82,675	284,165	3,829,554	11,915	3,841,469	49,382	35,729	0	47,637	
2008	63,596	210,198	640,715	7,591	648,306	20,474	19,644	0	28,901	
2009	67,633	222,291	9,987,899	10,348	9,998,247	23,685	25,891	0	33,870	
2010	6,865	22,434	11,126,864	940	11,127,804	25,049	2,960	0	3,965	
2011	7,068	23,339	4,979,760	1,192	4,980,952	2,657	3,077	0	4,040	
2012	528,105	1,697,649	1,131,895	80,498	1,212,393	119,011	102,960	0	119,747	
2013	861,503	2,312,969	2,146,842	97,192	2,244,034	208,736	172,308	0	214,650	
2014	382,559	1,772,859	275,279	96,663	371,942	154,563	170,720	0	212,534	
2015	229,172	795,159	248,061	74,568	322,629	97,564	104,434	0	124,151	
2016	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2017	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2018	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2019	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2020	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2021	55,429	226,052	217,230	49,541	266,771	33,000	29,351	0	24,038	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	78,212,649	297,721,550	293,251,592	55,290,761	348,542,353	51,764,893	24,470,470	759,941	19,272,543	

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 6 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION (continued)							SANTA ANA DIVISION		
	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]		
1952	892	5,788	35	2,013	2,074	2,413	21,386	3,334	5,599	
1953	3,402	17,846	71	5,752	6,886	7,438	65,936	10,275	17,264	
1954	4,548	23,558	369	8,560	7,849	9,820	87,036	13,566	22,790	
1955	2,213	7,947	178	2,754	2,725	3,313	29,357	4,575	7,687	
1956	2,655	8,542	216	2,905	2,961	3,561	31,562	4,917	8,264	
1957	9,826	31,616	800	10,757	10,962	13,177	116,825	18,205	30,586	
1958	16,752	53,569	1,397	18,717	18,578	22,627	199,237	31,001	52,019	
1959	18,604	56,724	1,844	25,421	20,372	45,646	255,388	39,325	58,137	
1960	37,179	43,893	11,029	136,751	17,152	109,816	449,110	65,655	93,700	
1961	37,102	21,532	14,517	215,859	9,546	373,473	777,154	26,979	56,734	
1962	10,730	8,197	4,186	164,168	4,336	279,421	817,994	9,964	36,235	
1963	40,865	26,670	17,081	237,695	7,228	358,503	1,205,145	31,013	112,271	
1964	71,116	33,912	22,793	262,996	6,863	244,003	1,495,651	69,669	202,642	
1965	343,506	91,095	65,689	827,655	11,836	621,566	2,916,174	279,237	206,356	
1966	1,311,628	160,388	178,538	1,746,245	31,078	1,018,628	6,629,975	415,066	364,004	
1967	1,718,942	498,257	367,961	3,146,128	62,135	2,331,106	11,009,612	3,184,296	638,539	
1968	2,291,691	1,141,929	1,145,768	4,588,850	102,207	2,600,293	21,078,184	8,264,126	1,268,194	
1969	5,626,284	2,358,737	1,515,147	7,750,478	260,659	11,131,406	37,268,731	6,807,783	1,768,456	
1970	5,304,372	3,232,911	2,081,810	23,451,612	1,240,798	16,885,193	59,277,133	2,169,051	7,229,429	
1971	1,091,123	825,070	432,464	16,772,680	1,922,115	5,385,721	29,292,507	1,135,248	9,811,736	
1972	635,507	484,772	324,865	3,788,894	48,049	788,479	7,085,469	1,095,740	5,528,987	
1973	83,840	63,774	36,179	1,623,274	24,333	4,225,877	6,247,801	136,994	1,810,729	
1974	118,639	103,545	54,198	5,699,605	130,567	766,562	7,248,472	68,180	1,922,999	
1975	169,294	167,240	19,453	4,793,580	19,467	373,783	5,731,466	166,653	3,787,797	
1976	102,909	44,896	24,732	3,103,916	84,188	204,705	3,837,735	475,176	1,494,750	
1977	120,160	71,389	49,445	1,654,122	60,112	232,230	2,708,024	76,255	776,095	
1978	68,838	32,855	18,183	677,448	36,484	210,198	1,711,657	57,463	131,076	
1979	36,225	18,948	10,675	560,506	10,634	103,615	1,754,670	29,960	80,482	
1980	284,545	133,526	121,171	2,239,224	60,229	559,963	5,914,309	31,462	181,638	
1981	32,214	13,223	6,466	(774,614)	138,917	203,941	1,737,796	5,864	69,031	
1982	77,988	13,158	14,459	432,274	346,905	79,819	8,717,975	9,224	159,280	
1983	58,714	25,900	10,363	451,428	2,029,405	58,989	13,652,234	4,304	528,764	
1984	35,378	845,423	6,052	(83,811)	1,290,740	34,764	10,799,037	3,850	270,455	
1985	(232,549)	(481,017)	1,945,477	608,583	966,160	51,634	8,422,737	5,555	62,571	
1986	(2,046,222)	(1,334,975)	3,260,280	1,097,122	230,510	51,994	7,713,451	9,927	114,561	
1987	(344,829)	55,519	64,264	3,631,282	146,850	91,223	5,552,802	4,908	27,208	
1988	(147,290)	(70,564)	351,489	552,546	558,557	197,761	2,039,009	7,358	161,957	
1989	60,657	30,217	534,658	4,161,037	1,496,776	433,072	7,382,673	8,092	(2,297,399)	
1990	(403,413)	(635,623)	(97,841)	8,794,258	1,394,698	344,367	8,620,068	176,854	(1,657,576)	
1991	(18,809)	(147,369)	(17,234)	7,985,326	3,624,824	139,105	11,753,895	202,286	(1,316,160)	
1992	338,098	(263,897)	75,210	4,849,560	8,364,426	127,829	14,808,798	333,934	(1,878,502)	
1993	180,598	133,941	49,144	2,094,764	15,390,366	159,211	19,571,092	1,506,787	3,979,221	
1994	114,273	65,260	26,546	933,021	8,082,401	81,869	10,577,079	2,104,588	2,493,097	
1995	121,499	66,503	30,918	1,096,953	5,924,175	123,653	8,050,530	3,310,564	500,791	
1996	48,699	44,953	17,787	1,736,686	2,181,669	96,339	4,344,851	19,019,751	(100,474)	
1997	39,973	55,881	27,865	809,666	(342,563)	102,390	1,000,244	7,645,602	(662,524)	
1998	27,626	20,285	12,816	273,139	3,392,776	36,135	3,880,497	993,619	1,613,505	
1999	58,392	37,650	17,874	1,006,721	2,208,657	123,472	3,792,422	224,119	843,638	
2000	75,230	44,857	20,181	724,837	1,251,684	83,871	2,495,486	129,156	1,285,637	
2001	121,907	77,799	54,526	550,843	342,964	26,780	1,773,370	73,031	447,282	
2002	(82,663)	(7,369)	(43,431)	270,386	269,139	71,793	264,007	54,815	1,753,554	
2003	(7,564)	(3,238)	(3,009)	382,025	146,659	30,255	599,146	86,731	350,997	
2004	12,619	13,744	5,414	262,810	48,570	12,285	411,358	13,577	275,709	
2005	18,874	25,074	6,335	62,967	104,838	144,149	433,301	16,962	120,279	
2006	4,511	5,983	1,500	15,163	294,318	577,859	917,747	21,932	16,665	
2007	35,725	47,634	11,908	151,063	919,040	69,935	1,368,053	12,905	55,918	
2008	19,526	25,456	6,313	346,638	3,113,899	2,019,852	5,600,703	2,481	82,555	
2009	24,745	32,909	8,241	940,452	448,164	1,834,401	3,372,358	2,972	260,999	
2010	2,992	3,992	997	2,207,142	26,737	1,373,264	3,647,098	(3)	119,968	
2011	2,966	3,947	988	5,917,166	4,612	99,900	6,039,353	11	31,884	
2012	72,145	93,911	23,873	7,878,524	2,018,225	560,615	10,989,011	3,180	805,774	
2013	145,777	192,406	48,441	620,100	1,224,593	4,466	2,831,477	2,738	1,518,307	
2014	144,190	190,290	47,912	2,370,706	106,900	4,466	3,402,281	2,738	3,635,687	
2015	77,904	101,907	25,817	2,151,030	57,585	4,466	2,744,858	2,738	1,264,961	
2016	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2017	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2018	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2019	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2020	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2021	2,821	1,794	790	16,201	1,726	4,466	114,187	2,738	3,579	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	18,250,194	9,103,670	13,078,133	148,123,564	72,036,955	58,395,256	415,255,619	60,740,746	52,664,279	

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 7 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)					WEST BRANCH				
	Reach 28G (a)	Reach 28H	Reach 28J	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]		
1952	4,785	4,055	3,020	20,793	2,924	136	175	459	553	
1953	15,580	11,511	9,476	64,106	9,093	344	237	1,754	1,683	
1954	18,015	18,100	12,160	84,631	7,389	1,201	2,229	2,350	4,162	
1955	6,052	6,081	4,151	28,546	1,019	585	1,086	1,147	2,029	
1956	6,496	6,525	4,480	30,682	490	698	1,297	1,366	2,420	
1957	24,044	24,156	16,585	113,576	1,809	2,583	4,792	5,057	8,952	
1958	40,844	41,033	28,470	193,367	3,256	4,516	8,714	8,878	15,847	
1959	45,746	45,946	44,331	233,485	7,953	9,150	19,414	18,243	35,583	
1960	59,102	58,548	118,969	395,974	21,753	14,990	34,447	29,764	69,752	
1961	32,226	34,382	674,787	825,108	22,442	12,775	21,559	20,086	39,761	
1962	21,383	20,530	47,484	135,596	40,237	28,729	86,938	58,215	108,962	
1963	43,884	41,698	1,506,440	1,735,306	91,959	69,162	163,347	110,015	211,592	
1964	89,710	45,762	98,569	506,352	150,670	66,420	207,977	143,340	291,404	
1965	96,956	76,899	146,095	805,543	361,811	77,914	403,115	127,430	589,638	
1966	170,878	308,756	589,107	1,847,811	489,512	203,497	1,233,640	348,918	3,231,797	
1967	233,968	283,126	987,832	5,327,761	1,589,715	882,096	1,117,243	891,607	31,088,491	
1968	871,337	266,295	780,587	11,450,539	3,899,363	300,921	396,190	1,104,832	36,157,768	
1969	1,117,873	1,444,654	756,442	11,895,208	6,592,580	336,480	693,348	1,184,454	9,655,871	
1970	1,843,621	1,013,468	2,829,523	15,085,092	7,986,733	6,089,401	2,624,747	3,002,968	8,463,475	
1971	16,095,702	6,401,303	12,111,623	45,555,612	4,247,037	3,768,699	1,120,231	8,244,651	5,844,024	
1972	1,537,880	11,960,791	21,542,747	41,666,145	1,871,831	426,932	985,512	18,787,722	(23,015,734)	
1973	209,664	247,769	3,673,344	6,078,500	775,824	168,064	399,856	9,408,706	1,821,206	
1974	162,178	101,638	1,980,991	4,235,988	560,657	168,878	169,717	3,901,261	(3,454,239)	
1975	157,365	124,399	1,626,274	5,862,488	353,670	421,176	925,693	664,113	609,891	
1976	178,287	118,748	1,497,465	3,764,426	396,809	650,417	1,274,484	706,244	650,209	
1977	127,106	89,036	323,091	1,391,573	390,637	3,018,637	2,152,961	196,012	1,135,148	
1978	147,112	153,867	347,482	837,000	1,427,190	2,219,135	6,694,615	57,817	149,932	
1979	29,723	19,225	225,947	385,337	940,013	2,168,382	19,813,742	597,858	331,313	
1980	137,833	154,821	1,077,900	1,583,654	1,276,793	4,108,143	24,537,814	550,337	204,751	
1981	28,815	22,654	61,349	187,713	(711,751)	2,699,873	19,806,531	94,944	28,852	
1982	16,069	58,900	55,841	299,314	(465,217)	351,251	17,964,617	215,678	42,587	
1983	18,213	89,581	(264,804)	376,058	100,394	180,971	6,751,649	220,029	24,295	
1984	14,462	12,259	49,547	350,573	71,759	68,930	2,870,259	335,942	17,285	
1985	17,816	11,481	54,070	151,493	142,244	25,386	2,126,670	102,366	21,971	
1986	31,564	25,037	86,794	267,883	133,914	62,294	274,660	141,894	36,149	
1987	17,141	8,005	45,528	102,790	13,936	453,949	711,773	192,511	27,931	
1988	41,892	21,113	90,784	323,104	427,544	118,010	1,660,959	203,130	95,930	
1989	28,708	12,619	51,556	(2,196,424)	207,067	430,662	584,186	241,811	97,472	
1990	27,478	12,817	55,408	(1,385,019)	197,428	355,480	386,882	813,211	54,269	
1991	142,139	15,524	62,794	(893,417)	219,321	344,386	453,336	1,132,520	55,176	
1992	34,185	13,422	69,479	(1,427,482)	541,026	295,312	464,421	4,402,524	47,182	
1993	44,300	27,047	162,854	5,720,209	464,987	320,182	643,189	3,361,457	74,198	
1994	16,351	11,673	54,581	4,680,290	203,666	231,527	362,717	306,148	33,758	
1995	35,402	28,202	164,254	4,039,213	344,358	392,647	536,253	468,656	34,007	
1996	76,723	73,629	344,747	19,414,376	150,901	161,394	427,223	203,201	15,357	
1997	50,662	20,720	268,293	7,322,753	298,002	71,310	432,940	276,180	50,095	
1998	10,268	8,970	479,138	3,105,500	346,973	21,003	2,028,979	181,951	49,377	
1999	84,683	45,293	324,223	1,521,956	296,520	37,641	1,080,682	125,373	51,213	
2000	64,095	41,331	114,224	1,634,443	212,174	33,747	238,676	116,588	13,241	
2001	20,193	13,635	88,656	642,797	43,281	6,448	104,127	110,850	10,737	
2002	53,787	12,619	196,949	2,071,724	171,190	30,767	252,912	60,146	7,881	
2003	1,096,665	2,482,179	179,466	4,196,038	50,519	9,141	103,160	57,712	51,000	
2004	1,736,308	856,587	24,559	2,906,740	47,768	6,780	27,718	107,695	215,925	
2005	2,049,655	410,021	270,894	2,867,811	273,482	12,718	54,409	6,642	52,413	
2006	2,302,259	406,071	2,571,775	5,318,702	660,664	3,079	115,825	1,557	2,299,565	
2007	(246)	1,099,958	3,664,358	4,832,893	107,460	25,257	1,958,512	269,569	347	
2008	835,530	899,508	682,829	2,502,903	2,090,139	14,503	103,704	1,001,788	2,089	
2009	4,202,648	976,867	2,819,145	8,262,631	1,931,429	17,722	22,988	1,463,563	631	
2010	43,408	930,165	3,865,738	4,959,276	864,340	2,114	24,691	231,970	(12)	
2011	1,173,995	577	1,955,691	3,162,158	425,260	2,100	2,215	39,980	41	
2012	4,080,824	2,431	17,616,286	22,508,495	1,326,269	1,025,897	366,466	28,168	32,914	
2013	6,893	2,093	24,616,186	26,146,217	61,699	1,457,725	221,328	52,138	9,860	
2014	6,893	2,093	83,949,746	87,597,157	483,511	96,861	114,531	51,609	9,860	
2015	6,893	2,093	38,774,388	40,051,073	33,827	52,670	65,216	29,515	9,860	
2016	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2017	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2018	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2019	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2020	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2021	6,893	2,093	5,772	21,075	2,994	2,613	9,357	4,488	9,860	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	41,983,379	31,792,854	236,707,330	423,888,588	45,305,217	34,655,476	128,495,666	66,851,548	77,888,857	

(a) Includes excess capacity costs (not shown in Table B-9) allocated to MWDSC in the following years and repaid under Article 24(c) of its contract: 1970 - \$362,000; 1971 - \$6,198,000; 1972 - \$139,000.

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge

(in dollars)

Sheet 8 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)										Total	GRAND TOTAL
	WEST BRANCH (cont.)		COASTAL BRANCH									
	Reach 30	Subtotal	Reach 31A	Reach 33A	Reach 33B	Reach 34	Reach 35	Reach 37	Reach 38	Subtotal		
[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	[76]	
1952	1,408	5,655	0	0	0	0	0	0	0	0	98,857	99,353
1953	4,346	17,457	0	0	0	0	0	0	0	0	309,387	311,812
1954	5,743	23,074	0	0	0	0	0	0	0	0	394,688	402,143
1955	1,943	7,809	0	0	0	0	0	0	0	0	159,842	169,342
1956	2,077	8,348	0	0	0	0	0	0	0	0	255,679	251,551
1957	7,584	30,877	0	0	0	0	0	0	0	0	708,753	1,464,452
1958	13,931	55,142	0	0	0	0	0	0	0	0	1,331,616	2,286,623
1959	44,384	134,727	28,046	49,114	0	7,441	8,236	0	0	92,837	2,096,392	2,967,412
1960	84,703	255,409	34,404	70,450	0	8,507	14,265	0	0	127,626	2,937,049	4,660,833
1961	123,330	239,953	13,801	17,868	0	1,501	3,931	0	0	37,101	4,650,264	8,545,244
1962	348,366	671,447	10,121	7,798	0	524	1,689	0	0	20,132	5,827,774	8,875,171
1963	521,491	1,167,566	20,470	14,299	0	880	2,943	0	0	38,592	18,981,487	24,610,278
1964	1,372,464	2,232,275	315,418	26,963	0	1,687	5,639	0	0	349,707	31,550,813	41,736,060
1965	3,383,950	4,943,858	747,023	36,178	0	2,118	7,060	0	0	792,379	57,936,405	62,664,743
1966	9,364,753	14,872,117	2,258,915	35,864	0	1,736	5,764	0	0	2,302,279	124,748,128	129,110,330
1967	17,618,827	53,187,979	6,310,419	38,331	0	1,891	6,213	0	0	6,356,854	187,465,580	194,146,365
1968	15,736,691	57,595,765	2,707,580	30,784	0	1,324	4,369	0	0	2,744,057	192,593,079	197,978,911
1969	16,228,175	34,690,908	423,797	26,549	0	907	2,905	0	0	454,158	182,530,023	184,473,490
1970	22,330,328	50,497,652	269,194	24,368	0	851	2,787	0	0	297,200	206,720,774	207,082,650
1971	16,890,503	40,115,145	164,446	32,230	0	1,315	3,804	0	0	201,795	158,414,033	158,624,739
1972	3,818,001	2,874,264	131,332	17,601	0	522	1,660	0	0	151,115	68,228,670	68,362,291
1973	13,426,222	25,999,878	182,493	16,154	0	542	1,758	0	0	200,947	45,110,823	45,263,853
1974	2,988,318	4,334,592	190,866	18,799	0	463	1,405	0	0	211,533	24,036,199	24,402,166
1975	1,808,235	4,782,778	64,582	36,012	0	2,255	6,656	0	0	109,505	21,065,768	21,318,838
1976	1,253,067	4,931,230	198,266	68,898	0	5,088	14,988	0	0	287,240	17,183,961	17,492,910
1977	345,023	7,238,418	918,473	81,305	0	1,834	5,387	0	0	1,006,999	15,165,801	15,544,382
1978	763,445	11,312,134	52,994	83,300	0	1,302	3,852	0	0	141,448	18,661,117	19,119,151
1979	282,145	24,133,453	38,182	108,951	0	1,505	4,433	0	0	153,071	31,202,118	31,857,382
1980	2,055,206	32,733,044	189,070	376,036	0	1,152	3,449	0	0	569,707	73,891,101	74,986,833
1981	275,460	22,193,909	19,897	(157,537)	0	1,427	4,261	0	0	(131,952)	15,246,649	15,742,773
1982	351,376	18,460,292	(16,381)	(96,449)	0	588	1,787	0	0	(110,455)	38,256,580	39,705,931
1983	566,545	7,843,883	85,496	67,106	0	794	2,398	0	0	155,794	34,705,281	38,044,649
1984	1,118,954	4,483,129	28,568	54,074	0	986	2,959	0	0	86,587	24,454,091	30,822,250
1985	284,243	2,702,880	36,834	54,314	0	2,111	6,263	0	0	99,522	14,914,930	28,537,556
1986	213,353	862,264	82,358	223,134	0	17,458	51,279	0	0	374,229	13,435,351	43,155,828
1987	158,313	1,558,413	53,817	1,061,939	0	92,506	272,968	0	0	1,481,230	11,711,428	34,331,982
1988	222,068	2,727,641	183,853	1,141,272	0	99,456	293,612	0	0	1,718,193	11,026,370	18,123,243
1989	148,674	1,709,872	84,678	893,765	0	77,283	228,038	0	0	1,283,764	30,302,112	33,130,497
1990	119,438	1,926,708	133,868	1,100,167	0	103,785	277,889	0	0	1,615,709	32,589,619	34,435,721
1991	229,315	2,434,054	164,610	1,635,283	0	123,603	363,889	0	0	2,287,385	38,320,942	39,811,664
1992	206,495	5,956,960	183,240	1,220,510	1,495,646	566,230	240,553	102,051	74,162	3,882,392	31,021,233	35,041,233
1993	296,349	5,160,362	344,928	5,274,657	5,052,431	1,345,211	688,935	268,937	358,367	13,333,466	53,122,384	53,921,787
1994	168,426	1,306,242	282,150	15,905,886	21,341,196	8,915,445	2,363,238	678,753	1,315,559	50,802,227	73,751,564	74,225,377
1995	304,983	2,080,904	1,196,326	45,172,271	62,947,362	23,975,738	20,849,939	7,029,108	7,117,197	168,287,941	191,033,090	191,525,571
1996	98,522	1,056,598	948,730	42,987,442	54,300,990	26,475,298	18,790,572	7,213,823	6,616,310	157,333,165	187,776,347	188,025,325
1997	233,956	1,362,483	562,583	11,209,633	13,893,576	10,456,863	4,149,105	545,378	798,606	41,615,744	62,137,369	62,583,537
1998	67,874	2,696,157	248,671	2,355,322	4,159,441	3,368,320	952,615	192,567	280,779	11,557,715	27,083,446	27,217,157
1999	118,013	1,709,442	288,236	2,906,010	4,398,935	2,616,574	356,318	36,680	51,648	10,654,401	24,085,344	24,556,084
2000	187,926	802,352	132,435	228,901	2,965,936	2,746,120	17,830	0	0	6,091,222	13,504,772	13,742,555
2001	23,847	299,290	103,281	(7,057)	568,968	3,960	(1,112)	0	0	668,040	5,130,620	7,470,507
2002	62,684	585,580	98,021	147,827	105,972	77,266	13,119	0	0	442,205	8,836,703	17,138,613
2003	34,282	305,814	42,075	43,753	31,706	25,734	6,272	0	0	149,540	3,109,622	10,874,441
2004	16,535	422,421	26,667	13,644	21,479	3,142	1,942	0	0	66,874	5,117,637	10,222,861
2005	594,136	993,800	29,337	(261,476)	38,618	526	327	0	0	(192,668)	8,116,635	10,591,744
2006	164,739	3,245,429	7,046	6,303	37,583	4	18,012	0	0	68,948	15,614,234	19,711,246
2007	31,047	2,392,192	37,460	32,702	42,774	0	152	0	0	113,088	13,325,242	19,796,705
2008	60,186	3,272,409	41,227	34,997	10,865	24	14,163	0	0	101,276	14,431,277	28,238,392
2009	47,211	3,483,544	19,458	17,409	2,357	43	44,176	0	0	83,443	26,147,525	39,761,681
2010	17,025	1,140,128	633,621	3,158	0	(1)	(1,210)	0	0	635,568	22,985,712	45,037,722
2011	2,023	471,619	848,388	611	0	4	4,284	0	0	853,287	17,010,576	35,805,362
2012	60,747	2,840,461	4,060,384	2,165,292	0	11,188	1,187,356	0	0	7,424,220	52,329,351	62,177,490
2013	108,077	1,910,827	1,106,262	356,803	0	1,772	1,022,254	0	0	2,487,091	60,506,648	62,020,270
2014	792,580	1,548,952	305,764	266,976	0	1,097	1,022,254	0	0	1,596,091	105,521,788	111,818,945
2015	62,827	253,915	145,258	136,574	0	1,004	1,022,254	0	0	1,305,090	46,566,727	47,312,950
2016	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2017	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2018	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2019	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2020	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2021	12,771	42,083	1,636	11,197	0	1,004	1,022,254	0	0	1,036,091	1,939,120	2,016,464
2022	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	138,349,614	491,546,378	27,828,854	137,480,250	171,415,835	81,162,928	60,515,408	16,067,297	16,612,628	511,083,200	2,842,411,863	3,115,227,691

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 1 of 9

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	37,396	5,522	0	0
1963	0	0	0	0	0	0	147,719	20,639	0	0
1964	0	0	0	0	0	0	149,750	15,574	19,405	0
1965	0	0	0	0	0	0	259,939	45,718	46,485	0
1966	0	0	0	0	0	0	270,890	23,799	63,921	0
1967	0	0	0	0	0	0	438,050	32,798	108,127	0
1968	0	0	0	0	130	130	410,919	44,277	66,973	706
1969	0	0	0	0	80,875	80,875	487,377	48,339	75,644	706
1970	0	0	0	0	94,872	94,872	381,734	44,852	64,833	71,376
1971	54	0	0	0	45,579	45,579	357,850	25,666	50,344	38,735
1972	40	0	0	0	37,895	37,895	347,941	30,606	56,800	100,106
1973	1	0	0	0	32,993	32,993	386,897	36,172	58,288	28,810
1974	143	0	0	0	46,498	46,498	456,381	57,081	83,120	61,623
1975	1,069	0	0	0	37,707	37,707	624,989	46,111	81,361	36,682
1976	139	0	0	0	60,786	60,786	614,362	47,862	123,838	91,096
1977	892	0	0	0	78,400	78,400	511,065	48,926	104,280	102,083
1978	39	0	0	0	56,318	56,318	671,195	125,224	176,855	50,289
1979	3,235	0	0	0	73,852	73,852	650,826	76,849	212,826	91,380
1980	416	0	0	0	81,769	81,769	1,128,840	212,974	242,118	110,786
1981	3,847	0	0	0	101,340	101,340	884,763	130,126	167,118	204,772
1982	11,075	0	0	0	191,987	191,987	1,156,605	141,718	249,447	96,020
1983	1,928	0	0	0	80,215	80,215	1,258,144	84,360	373,875	152,255
1984	3,765	0	0	0	139,121	139,121	1,998,984	113,797	340,344	34,461
1985	2,888	0	0	0	259,515	259,515	2,044,121	207,478	427,930	247,308
1986	2,787	0	0	0	229,508	229,508	1,834,838	285,908	305,149	159,054
1987	2,388	0	0	0	310,683	310,683	2,118,974	163,714	400,547	283,067
1988	545	0	(94)	0	330,156	330,062	2,068,655	186,275	299,934	370,212
1989	1,800	473,408	178,069	237,480	373,427	1,262,384	2,164,688	163,481	320,734	497,038
1990	788	556,610	244,897	123,144	427,257	1,351,908	2,233,036	251,434	355,022	571,415
1991	3,654	651,307	302,327	205,516	428,470	1,587,620	1,806,699	152,509	95,745	93,986
1992	647	443,912	189,330	265,462	280,505	1,179,209	2,064,907	405,932	409,435	363,964
1993	3,630	435,240	294,416	213,267	289,206	1,232,129	3,925,050	621,712	480,832	399,558
1994	2,279	430,112	198,322	206,594	365,646	1,200,674	4,673,275	302,115	404,709	408,066
1995	2,906	428,313	282,898	151,703	295,326	1,158,240	3,849,620	316,905	566,447	330,706
1996	8,007	796,526	272,743	240,106	260,001	1,569,376	3,526,989	254,075	664,485	493,300
1997	7,449	504,476	210,763	213,211	315,374	1,243,824	3,010,809	189,269	591,540	230,371
1998	798	404,834	227,562	204,821	251,154	1,088,371	2,965,219	426,872	532,042	303,263
1999	416	680,206	333,478	298,434	290,508	1,602,626	3,760,568	480,519	439,758	468,562
2000	505	924,082	257,016	658,778	415,550	2,255,426	3,835,997	545,050	445,371	563,563
2001	319	1,072,906	232,782	455,912	181,531	1,943,131	2,909,768	272,877	290,335	391,239
2002	3,627	1,587,083	418,416	411,471	399,018	2,813,988	3,858,106	342,137	467,256	539,273
2003	3,393	1,783,857	551,099	572,442	357,563	3,264,961	2,389,867	371,064	585,185	973,289
2004	3,455	1,610,031	640,791	743,771	822,223	3,816,816	3,390,359	516,670	758,452	710,717
2005	3,452	1,063,514	325,460	769,091	413,961	2,572,026	3,331,412	265,370	432,215	814,222
2006	3,867	816,404	259,760	599,513	440,819	2,116,496	3,454,003	377,612	749,500	604,256
2007	3,168	1,127,576	313,199	474,515	289,241	2,204,531	4,908,435	673,321	581,368	783,012
2008	3,724	890,335	272,975	525,140	626,813	2,315,263	5,104,538	668,844	727,006	920,910
2009	542	1,255,959	319,495	611,668	599,779	2,786,901	3,907,573	560,342	646,535	1,347,557
2010	628	2,585,890	183,741	1,077,639	353,288	4,200,558	4,327,096	590,032	804,784	650,101
2011	727	2,516,883	623,413	1,176,841	516,038	4,833,175	5,198,918	737,136	779,356	503,657
2012	669	3,043,850	414,504	1,201,961	606,074	5,266,289	5,104,221	730,674	816,252	(204,948)
2013	685	3,210,755	449,269	1,136,450	497,082	5,293,556	5,428,549	783,555	864,290	713,754
2014	702	3,045,154	412,546	1,059,714	478,251	4,985,665	4,920,444	734,736	830,542	699,482
2015	692	3,130,919	429,694	1,144,002	532,407	5,237,022	5,202,582	757,152	845,398	406,791
2016	699	3,162,228	433,991	1,155,442	537,731	5,289,392	5,254,608	764,723	853,852	410,859
2017	706	3,193,851	438,331	1,166,996	543,109	5,342,287	5,307,154	772,370	862,391	414,967
2018	713	3,225,789	442,715	1,178,666	548,540	5,395,710	5,360,225	780,094	871,015	419,117
2019	720	3,258,047	447,142	1,190,453	554,025	5,449,667	5,413,827	787,895	879,725	423,308
2020	727	3,290,628	451,613	1,202,357	559,565	5,504,163	5,467,966	795,774	888,522	427,541
2021	734	3,323,534	456,129	1,214,381	565,161	5,559,205	5,522,645	803,732	897,407	431,816
2022	742	3,356,769	460,691	1,226,525	570,813	5,614,798	5,577,872	811,769	906,381	436,135
2023	749	3,390,337	465,297	1,238,790	576,521	5,670,945	5,633,650	819,887	915,445	440,496
2024	757	3,424,240	469,950	1,251,178	582,286	5,727,654	5,689,987	828,085	924,600	444,901
2025	764	3,458,483	474,650	1,263,690	588,109	5,784,932	5,746,887	836,366	933,846	449,350
2026	772	3,493,067	479,396	1,276,327	593,990	5,842,780	5,804,356	844,730	943,184	453,843
2027	780	3,527,998	484,190	1,289,090	599,930	5,901,208	5,862,399	853,177	952,616	458,382
2028	787	3,563,278	489,032	1,301,981	605,929	5,960,220	5,921,023	861,709	962,142	462,966
2029	795	3,598,911	493,923	1,315,001	611,989	6,019,824	5,980,234	870,326	971,764	467,595
2030	803	3,634,900	498,862	1,328,151	618,108	6,080,021	6,040,036	879,029	981,481	472,271
2031	811	3,671,249	503,850	1,341,432	624,290	6,140,821	6,100,436	887,820	991,296	476,994
2032	819	3,707,961	508,889	1,354,846	630,532	6,202,228	6,161,441	896,698	1,001,209	481,764
2033	828	3,745,041	513,978	1,368,395	636,838	6,264,252	6,223,055	905,665	1,011,221	486,582
2034	836	3,782,492	519,118	1,382,079	643,206	6,326,895	6,285,286	914,722	1,021,333	491,447
2035	844	3,820,316	524,309	1,395,900	649,638	6,390,163	6,348,138	923,869	1,031,547	496,362
TOTAL	113,166	105,099,261	18,392,927	40,420,226	25,317,021	189,229,435	238,653,157	31,722,200	38,485,133	25,955,327

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 2 of 9

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT			
						NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	42,918	0	0	0	0
1963	0	0	0	0	168,358	0	0	0	0
1964	0	0	0	0	184,729	0	0	0	0
1965	2,634	6,490	4,704	12,904	378,874	0	0	0	0
1966	4,707	10,328	9,233	25,519	408,397	0	0	0	0
1967	2,712	7,659	10,812	34,347	634,505	0	0	0	0
1968	3,109	7,960	10,166	40,372	584,482	1,001,998	228,359	103,116	1,333,473
1969	3,944	5,975	8,795	38,566	669,346	933,116	301,596	188,194	1,422,906
1970	2,464	(1,991)	6,870	28,210	598,348	971,602	306,198	151,539	1,429,339
1971	3,116	9,394	9,895	31,068	526,068	1,103,021	254,786	113,694	1,471,501
1972	5,125	10,247	12,054	44,699	607,578	1,107,855	230,906	110,109	1,448,870
1973	4,178	7,500	4,890	43,816	570,551	1,150,864	221,445	100,221	1,472,530
1974	7,812	7,564	5,523	48,054	727,158	1,272,034	231,383	117,156	1,620,573
1975	18,120	14,683	18,325	68,377	908,648	1,434,736	455,110	201,075	2,090,921
1976	10,873	5,557	19,920	49,921	963,429	1,519,801	217,348	453,400	2,190,549
1977	(240)	2,228	8,391	89,579	866,312	1,913,643	292,380	196,564	2,402,587
1978	(1,404)	16,766	(5,313)	104,078	1,137,690	1,860,456	306,503	188,214	2,355,173
1979	1,269	29,294	7,351	106,835	1,176,630	1,848,109	231,339	145,205	2,224,653
1980	3,621	24,270	17,404	110,852	1,850,865	2,365,292	472,660	247,608	3,085,560
1981	4,038	20,109	17,586	98,143	1,526,655	2,649,730	435,226	154,191	3,239,147
1982	2,236	22,870	21,919	202,590	1,893,405	3,192,710	599,793	244,664	4,037,167
1983	(2,047)	48,781	45,573	216,434	2,177,375	4,244,937	802,908	273,081	5,320,926
1984	4,449	44,017	23,563	455,054	3,014,669	4,373,157	808,917	290,728	5,472,802
1985	13,097	74,565	57,920	238,067	3,310,486	4,717,323	829,825	189,199	5,536,347
1986	11,614	31,084	46,864	363,350	3,037,861	5,217,491	929,919	359,365	6,506,775
1987	15,273	25,182	37,949	416,375	3,461,081	5,292,200	958,927	362,065	6,613,192
1988	30,207	41,047	49,156	335,408	3,380,894	5,329,317	822,300	360,336	6,511,953
1989	9,740	54,881	114,203	179,323	3,504,088	5,753,966	851,745	907,609	7,513,320
1990	31,161	69,416	119,309	247,781	3,878,574	6,788,986	1,066,314	883,822	8,739,122
1991	22,434	(18,690)	99,577	262,052	2,514,312	6,796,247	1,067,078	585,008	8,448,333
1992	26,787	332,012	98,670	186,640	3,888,347	9,415,121	1,419,603	673,833	11,508,557
1993	24,845	181,592	94,169	316,045	6,043,803	10,274,070	1,371,074	900,996	12,546,140
1994	28,383	90,791	80,942	416,061	6,404,342	8,451,199	1,325,511	802,217	10,578,927
1995	29,298	64,012	80,278	373,657	5,610,923	10,406,784	2,386,507	959,685	13,752,976
1996	(1,020)	60,610	11,672	312,097	5,322,208	10,246,985	2,604,651	628,177	13,479,813
1997	18,428	95,321	15,891	335,566	4,486,995	10,429,338	1,098,381	2,084,859	13,612,578
1998	26,323	54,255	611,290	658,090	5,577,354	11,409,135	1,449,411	5,364,368	18,222,914
1999	50,754	36,944	431,026	2,037,263	7,705,394	11,643,735	1,450,708	1,344,328	14,438,771
2000	135,957	88,416	187,111	643,304	6,444,769	12,693,558	897,127	650,750	14,241,435
2001	112,971	188,993	197,745	1,048,193	5,412,121	17,559,888	1,382,450	754,806	19,697,144
2002	143,906	171,249	500,977	2,780,544	8,803,448	14,409,553	862,631	620,163	15,892,347
2003	80,247	99,526	249,003	991,378	5,739,559	16,698,652	1,768,842	769,990	19,237,484
2004	159,263	181,127	206,706	458,743	6,382,037	14,104,813	1,242,260	698,961	16,046,034
2005	143,913	203,035	136,107	225,974	5,552,248	12,529,335	1,952,869	881,964	15,364,168
2006	143,584	123,946	80,305	390,488	5,923,694	13,920,360	1,942,173	1,278,354	17,140,887
2007	81,797	120,159	75,434	258,590	7,482,106	12,134,608	1,747,468	661,733	14,543,809
2008	170,851	162,100	240,813	258,929	8,253,991	16,021,084	1,494,611	837,813	18,353,508
2009	90,724	146,752	128,045	617,908	7,535,436	14,084,532	1,168,955	910,947	16,164,434
2010	61,307	541,265	50,136	473,588	7,498,309	13,433,002	2,199,460	1,471,066	17,103,528
2011	91,465	91,599	84,689	491,444	7,978,264	16,637,282	2,942,234	1,494,531	21,074,047
2012	87,438	279,948	93,418	483,593	7,390,596	18,233,660	1,675,583	1,383,849	21,293,092
2013	93,720	290,928	98,701	507,665	8,781,162	22,621,187	1,801,841	1,915,504	26,338,532
2014	87,994	290,099	95,322	496,446	8,155,065	17,505,888	1,674,990	1,234,068	20,414,946
2015	90,614	289,862	96,772	500,860	8,190,031	19,648,115	1,734,646	1,526,251	22,909,012
2016	91,520	292,761	97,740	505,869	8,271,932	19,844,596	1,751,992	1,541,514	23,138,102
2017	92,436	295,688	98,717	510,927	8,354,650	20,043,042	1,769,512	1,556,929	23,369,483
2018	93,360	298,645	99,704	516,037	8,438,197	20,243,472	1,787,207	1,572,498	23,603,177
2019	94,293	301,631	100,701	521,197	8,522,577	20,445,907	1,805,079	1,585,223	23,839,209
2020	95,236	304,648	101,708	526,409	8,607,804	20,650,366	1,823,130	1,604,106	24,077,602
2021	96,189	307,694	102,726	531,673	8,693,882	20,856,870	1,841,361	1,620,147	24,318,378
2022	97,151	310,771	103,753	536,990	8,780,822	21,065,438	1,859,775	1,636,348	24,561,561
2023	98,122	313,879	104,790	542,360	8,868,629	21,276,093	1,878,373	1,652,712	24,807,178
2024	99,103	317,018	105,838	547,783	8,957,315	21,488,854	1,897,156	1,669,239	25,055,249
2025	100,094	320,188	106,897	553,261	9,046,889	21,703,742	1,916,128	1,685,931	25,305,801
2026	101,095	323,390	107,966	558,794	9,137,358	21,920,780	1,935,289	1,702,790	25,558,859
2027	102,106	326,624	109,045	564,382	9,228,731	22,139,988	1,954,642	1,719,818	25,814,448
2028	103,127	329,890	110,136	570,025	9,321,018	22,361,387	1,974,189	1,737,016	26,072,592
2029	104,159	333,189	111,237	575,726	9,414,230	22,585,001	1,993,931	1,754,387	26,333,319
2030	105,200	336,521	112,349	581,483	9,508,370	22,810,851	2,013,870	1,771,930	26,596,651
2031	106,252	339,886	113,473	587,298	9,603,455	23,038,960	2,034,009	1,789,650	26,862,619
2032	107,315	343,285	114,608	593,171	9,699,491	23,269,349	2,054,349	1,807,546	27,131,244
2033	108,388	346,718	115,754	599,102	9,796,485	23,502,043	2,074,892	1,825,622	27,402,557
2034	109,472	350,185	116,911	605,093	9,894,449	23,737,063	2,095,641	1,843,878	27,676,582
2035	110,567	353,687	118,080	611,144	9,993,394	23,974,434	2,116,597	1,862,317	27,953,348
TOTAL	4,208,976	11,208,025	6,879,794	30,293,554	387,406,166	844,308,711	90,894,073	70,717,977	1,005,920,761

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 3 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	120,038	428,308	130,105	44,591	104,033	827,075	0	0	0
1969	90,033	460,907	184,467	35,696	235,322	1,006,425	22,013	134,760	86,103
1970	89,547	484,300	226,002	66,070	192,582	1,058,501	26,207	156,981	128,273
1971	99,917	541,574	175,592	64,193	158,170	1,039,446	32,312	190,753	118,372
1972	116,708	647,979	174,519	73,670	154,783	1,167,659	35,031	187,242	130,396
1973	116,791	611,705	158,145	58,344	153,955	1,098,940	51,150	225,747	127,530
1974	120,309	671,455	150,835	63,905	150,230	1,156,734	34,752	199,127	131,298
1975	133,593	839,285	178,974	81,478	157,586	1,390,916	78,523	250,377	159,006
1976	54,938	883,956	220,832	90,305	174,835	1,424,866	39,348	133,933	123,424
1977	73,331	1,114,465	270,734	98,132	196,311	1,752,973	38,086	121,348	178,078
1978	45,867	898,992	203,261	106,938	203,079	1,458,137	45,552	178,805	129,928
1979	223,973	842,508	144,055	99,670	180,734	1,490,940	69,973	150,679	129,756
1980	243,507	1,176,463	222,942	127,625	281,860	2,052,397	57,726	274,848	185,155
1981	265,766	1,065,358	193,048	90,533	1,612,157	3,226,862	80,121	198,256	144,187
1982	279,250	1,241,285	209,371	114,421	1,433,180	3,277,507	59,424	269,086	233,494
1983	214,468	1,949,017	339,809	131,377	2,143,678	4,778,349	49,448	383,476	223,078
1984	241,273	2,233,969	335,166	163,858	2,111,386	5,085,652	42,062	458,489	300,924
1985	322,068	2,882,583	360,431	176,577	1,603,532	5,345,191	58,820	495,500	213,368
1986	416,027	2,996,792	472,551	252,188	601,250	4,738,808	90,730	478,786	596,900
1987	362,738	3,104,592	424,107	236,349	439,232	4,567,018	113,962	412,042	446,067
1988	365,209	2,954,186	456,864	231,754	639,242	4,647,255	96,728	379,073	417,991
1989	263,171	3,182,472	393,589	332,986	633,419	4,805,637	83,282	389,698	400,853
1990	397,353	4,011,110	579,073	464,639	729,132	6,181,307	111,019	436,849	515,611
1991	256,473	4,388,184	543,760	728,156	765,765	6,682,338	104,414	496,794	465,940
1992	302,021	3,792,401	795,587	363,134	815,590	6,068,733	118,315	511,982	417,871
1993	439,725	4,337,616	1,008,394	551,849	734,796	7,072,380	230,338	745,885	490,159
1994	282,579	4,376,461	816,129	396,768	492,860	6,364,797	125,398	602,404	572,557
1995	107,995	5,026,076	1,066,971	440,006	1,356,668	7,997,716	185,681	657,282	432,072
1996	1,003,229	4,738,221	931,944	683,323	1,034,376	8,391,093	112,062	416,294	472,350
1997	859,665	5,761,996	924,289	254,934	646,209	8,447,083	128,190	449,316	728,436
1998	690,845	5,520,206	1,242,589	534,931	654,538	8,643,109	115,748	457,845	429,433
1999	606,554	5,825,181	1,227,696	544,839	685,070	8,889,340	108,267	428,344	443,434
2000	718,617	5,895,636	1,044,252	535,047	884,174	9,077,726	105,165	464,638	512,116
2001	(569,644)	7,158,744	851,780	372,959	679,759	8,493,598	58,446	553,988	603,813
2002	1,077,005	5,172,734	666,115	251,336	733,490	7,900,680	54,750	730,828	418,004
2003	1,053,811	6,142,402	764,734	315,556	633,421	8,909,924	63,209	687,532	662,411
2004	641,491	6,985,734	702,502	353,209	596,353	9,279,289	36,392	487,060	354,247
2005	552,069	5,978,934	984,769	401,831	799,558	8,717,161	29,047	408,760	303,730
2006	(58,859)	6,076,746	1,589,198	630,527	922,957	9,160,569	48,927	546,182	802,683
2007	1,117,096	7,605,738	1,977,312	689,881	971,854	12,381,681	240,280	864,850	543,132
2008	886,287	10,614,381	2,173,507	663,175	1,021,298	15,358,648	71,948	465,790	663,347
2009	986,454	8,070,910	1,235,282	510,912	1,174,022	11,977,580	39,627	753,323	491,545
2010	980,286	9,384,821	1,615,482	592,002	1,383,596	13,956,187	69,884	719,306	557,414
2011	1,040,058	7,166,443	2,555,655	585,371	1,582,532	12,930,059	19,869	607,906	797,584
2012	1,460,649	9,337,113	3,304,912	820,025	1,855,611	16,778,310	48,229	883,238	832,309
2013	1,684,771	9,528,110	2,110,037	704,194	1,751,749	15,778,861	47,307	824,061	743,697
2014	1,577,233	8,980,419	1,995,664	671,841	1,664,395	14,889,552	47,595	810,570	716,735
2015	1,589,960	9,374,699	2,494,906	739,340	1,774,825	15,973,730	48,188	847,682	771,889
2016	1,605,860	9,468,446	2,519,855	746,734	1,792,573	16,133,468	48,670	856,159	779,608
2017	1,621,918	9,563,130	2,545,054	754,201	1,810,498	16,294,801	49,157	864,720	787,404
2018	1,638,138	9,669,282	2,570,504	761,743	1,828,603	16,457,750	49,648	873,367	795,278
2019	1,654,519	9,755,349	2,596,209	769,360	1,846,890	16,622,327	50,145	882,101	803,231
2020	1,671,064	9,852,903	2,622,171	777,054	1,865,358	16,788,550	50,646	890,922	811,264
2021	1,687,775	9,951,432	2,648,393	784,825	1,884,012	16,956,437	51,153	899,831	819,376
2022	1,704,653	10,050,946	2,674,877	792,673	1,902,852	17,126,001	51,664	908,830	827,570
2023	1,721,699	10,151,455	2,701,626	800,599	1,921,881	17,297,260	52,181	917,918	835,846
2024	1,738,916	10,252,970	2,728,642	808,605	1,941,099	17,470,232	52,703	927,097	844,204
2025	1,756,305	10,355,500	2,755,928	816,692	1,960,510	17,644,935	53,230	936,368	852,646
2026	1,773,868	10,459,055	2,783,488	824,858	1,980,116	17,821,385	53,762	945,732	861,173
2027	1,791,607	10,563,645	2,811,323	833,107	1,999,917	17,999,599	54,300	955,189	869,784
2028	1,809,523	10,669,282	2,839,436	841,438	2,019,916	18,179,595	54,843	964,741	878,482
2029	1,827,618	10,775,975	2,867,830	849,852	2,040,115	18,361,390	55,391	974,388	887,267
2030	1,845,894	10,883,734	2,896,508	858,351	2,060,516	18,545,003	55,945	984,132	896,140
2031	1,864,353	10,992,572	2,925,474	866,935	2,081,121	18,730,455	56,504	993,974	905,101
2032	1,882,997	11,102,497	2,954,728	875,604	2,101,933	18,917,759	57,069	1,003,913	914,152
2033	1,901,827	11,213,522	2,984,276	884,360	2,122,952	19,106,937	57,640	1,013,953	923,294
2034	1,920,845	11,325,658	3,014,118	893,204	2,144,181	19,298,006	58,216	1,024,092	932,527
2035	1,940,054	11,438,914	3,044,260	902,136	2,165,623	19,490,987	58,799	1,034,333	941,852
TOTAL	59,301,678	410,948,914	96,312,638	32,982,576	79,375,820	678,921,626	4,645,211	40,379,475	36,512,799

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 4 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)								
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	83,706	59,077	0	0	0	0	0	0	0
1970	118,046	85,758	94,171	123,374	152,424	0	0	0	0
1971	129,811	80,282	95,075	91,389	167,142	691,791	151,979	111,623	529,723
1972	117,625	84,287	98,647	115,592	146,096	877,535	124,831	101,479	609,058
1973	117,706	92,257	74,238	114,843	221,385	961,855	120,106	99,429	692,748
1974	141,658	98,103	74,914	193,523	141,540	898,272	143,866	115,649	853,098
1975	207,908	124,105	61,799	117,194	108,154	1,156,757	180,614	119,889	988,045
1976	139,134	69,715	33,655	147,908	134,063	1,124,051	177,086	114,133	1,037,799
1977	194,086	108,644	91,547	175,039	137,975	1,397,006	203,837	119,467	1,194,667
1978	168,634	106,702	72,585	170,578	151,120	1,254,043	139,662	132,224	1,265,813
1979	175,107	85,942	56,331	174,147	150,029	1,490,461	201,935	260,981	1,216,126
1980	284,207	120,896	123,120	167,249	164,749	1,988,619	189,132	238,607	1,437,614
1981	199,927	76,965	33,322	113,202	171,669	1,741,488	163,934	161,182	1,799,832
1982	284,947	158,178	142,631	224,170	224,051	1,793,867	195,086	15,768	1,933,959
1983	308,801	136,350	124,724	203,733	217,324	2,421,794	199,708	181,879	2,550,842
1984	396,448	163,331	108,212	188,724	245,764	3,312,127	329,490	204,332	3,215,901
1985	298,337	198,368	154,995	194,327	360,308	3,463,178	237,127	180,068	3,427,049
1986	422,493	248,170	242,660	346,410	349,369	3,781,427	320,984	360,156	3,574,451
1987	488,226	334,059	325,697	469,378	322,824	3,731,912	463,757	238,813	4,080,465
1988	532,489	290,881	220,658	374,653	318,253	3,451,893	411,110	313,806	3,746,920
1989	733,030	268,025	207,487	595,433	380,883	3,512,884	333,996	220,978	3,751,081
1990	651,465	363,652	225,171	480,738	677,729	4,021,727	439,953	212,851	4,381,643
1991	716,328	328,683	269,873	371,312	433,313	4,309,082	424,704	273,169	4,566,702
1992	574,145	334,579	270,768	409,314	423,717	4,734,368	729,211	571,412	4,270,793
1993	723,450	413,722	278,375	496,851	594,201	5,182,830	664,063	423,780	5,266,124
1994	703,493	346,600	239,873	482,301	445,909	4,012,614	414,899	254,393	3,727,019
1995	881,902	405,045	242,253	622,654	507,102	4,607,154	309,283	315,905	3,973,757
1996	984,784	367,570	238,622	519,560	604,736	4,892,967	214,773	187,784	4,331,630
1997	1,864,113	309,696	254,080	516,115	429,771	5,094,202	261,221	275,610	4,011,366
1998	1,011,284	295,927	170,556	384,226	484,072	4,752,549	309,440	248,178	4,694,822
1999	1,164,599	396,923	196,320	425,633	546,106	5,125,184	345,662	223,518	4,912,931
2000	923,079	406,539	326,075	651,714	567,704	5,999,561	357,208	150,279	5,383,773
2001	871,479	415,882	895,986	521,614	661,092	4,700,319	(134,799)	(95,169)	6,008,227
2002	1,309,338	380,972	296,995	959,902	861,795	5,951,342	52,538	251,678	5,601,627
2003	827,703	344,147	238,353	405,532	626,023	6,249,912	(129,678)	71,981	7,102,971
2004	615,288	250,322	178,822	641,809	600,590	3,343,321	(129,272)	(160,424)	9,047,773
2005	903,216	214,036	120,086	856,072	473,508	6,279,171	(176,928)	(189,001)	5,928,134
2006	497,935	204,832	66,401	773,527	523,638	5,175,453	(148,426)	(159,465)	8,355,399
2007	637,035	274,749	303,866	560,678	565,536	6,656,623	(401,243)	(327,226)	10,849,929
2008	943,899	438,792	248,121	428,854	733,400	11,114,334	(226,480)	(176,192)	12,928,750
2009	930,126	424,080	225,036	614,423	574,324	7,796,844	538,162	(51,097)	8,862,887
2010	730,880	460,672	130,273	425,725	715,024	7,834,428	(164,151)	(61,376)	6,823,070
2011	1,149,691	624,778	322,784	853,254	1,540,820	8,843,671	(260,980)	(74,611)	6,559,614
2012	1,242,909	671,711	325,899	949,276	1,132,645	11,472,774	704,220	305,345	8,197,495
2013	1,117,296	601,966	292,679	754,704	1,143,675	12,825,627	581,008	308,339	8,463,807
2014	1,080,197	581,103	282,424	725,630	1,080,542	9,998,392	529,285	293,712	8,692,961
2015	1,158,269	624,443	303,337	784,302	1,130,144	11,546,587	610,886	305,490	8,535,935
2016	1,169,852	630,687	306,371	792,145	1,141,445	11,662,053	616,995	308,545	8,621,295
2017	1,181,550	636,994	309,434	800,067	1,152,859	11,778,673	623,165	311,630	8,707,508
2018	1,193,366	643,364	312,529	808,068	1,164,388	11,896,460	629,397	314,746	8,794,583
2019	1,205,299	649,797	315,654	816,148	1,176,032	12,015,424	635,691	317,894	8,882,528
2020	1,217,352	656,295	318,811	824,310	1,187,792	12,135,579	642,048	321,073	8,971,354
2021	1,229,526	662,858	321,999	832,553	1,199,670	12,256,934	648,468	324,283	9,061,067
2022	1,241,821	669,487	325,219	840,878	1,211,667	12,379,504	654,953	327,526	9,151,678
2023	1,254,239	676,182	328,471	849,287	1,223,784	12,503,299	661,502	330,802	9,243,195
2024	1,266,782	682,944	331,756	857,780	1,236,021	12,628,332	668,117	334,110	9,335,627
2025	1,279,450	689,773	335,073	866,358	1,248,382	12,754,615	674,799	337,451	9,428,983
2026	1,292,244	696,671	338,424	875,021	1,260,865	12,882,161	681,547	340,825	9,523,273
2027	1,305,167	703,638	341,808	883,772	1,273,474	13,010,983	688,362	344,233	9,618,505
2028	1,318,218	710,674	345,226	892,609	1,286,209	13,141,093	695,246	347,676	9,714,691
2029	1,331,400	717,781	348,678	901,535	1,299,071	13,272,504	702,198	351,152	9,811,837
2030	1,344,714	724,958	352,165	910,551	1,312,062	13,405,229	709,220	354,664	9,909,956
2031	1,358,162	732,208	355,687	919,656	1,325,182	13,539,281	716,312	358,211	10,009,055
2032	1,371,743	739,530	359,244	928,853	1,338,434	13,674,674	723,475	361,793	10,109,146
2033	1,385,461	746,925	362,836	938,141	1,351,818	13,811,420	730,710	365,411	10,210,237
2034	1,399,315	754,395	366,465	947,523	1,365,337	13,949,535	738,017	369,065	10,312,340
2035	1,413,308	761,939	370,129	956,998	1,378,990	14,089,030	745,397	372,755	10,415,463
TOTAL	55,495,198	27,358,616	16,125,475	37,558,839	47,475,720	472,358,779	23,568,418	13,413,171	399,361,080

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 5 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)		TEHACHAPI DIVISION			MOJAVE DIVISION			
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 20A	Reach 20B
	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	385,659	0	0	0	0	0	0	0
1970	0	885,234	0	0	0	0	0	0	0
1971	10,291	2,400,543	3,471	0	3,471	0	0	0	0
1972	1,106,884	3,734,703	1,424,782	28,127	1,452,909	36,699	135,675	130,711	120,271
1973	1,243,941	4,142,935	1,777,260	49,949	1,827,209	36,207	146,739	161,838	148,631
1974	1,343,972	4,369,772	2,298,091	16,259	2,314,350	30,525	90,404	115,571	88,200
1975	1,537,862	5,090,233	2,403,430	35,193	2,438,623	40,588	122,584	137,684	118,898
1976	1,727,428	5,001,677	2,776,194	126,653	2,902,847	118,610	201,215	182,927	151,555
1977	1,961,081	6,065,390	3,845,464	83,936	3,929,400	93,565	226,906	180,884	112,589
1978	1,922,950	5,738,596	2,954,313	42,637	2,996,950	91,815	200,759	215,673	120,584
1979	1,798,566	5,960,033	3,539,402	45,997	3,585,399	99,670	307,386	261,205	194,104
1980	2,231,456	7,463,378	4,749,245	54,806	4,804,051	116,487	446,175	290,719	237,250
1981	2,762,773	7,646,858	5,485,957	64,886	5,550,843	316,590	585,003	325,112	292,081
1982	2,961,383	8,475,944	6,349,080	55,997	6,405,077	447,739	638,615	275,763	330,502
1983	4,302,165	11,303,322	14,153,033	96,397	14,249,430	345,229	564,698	368,139	326,767
1984	5,077,824	14,043,628	18,448,383	77,201	18,525,584	267,497	563,588	413,443	329,933
1985	5,683,454	14,964,899	18,134,698	137,928	18,272,626	298,932	475,028	450,444	388,327
1986	5,780,666	16,593,102	19,297,129	109,938	19,407,067	703,413	350,906	347,690	315,566
1987	5,636,043	17,063,245	17,398,908	98,355	17,497,263	1,261,056	558,996	818,475	357,971
1988	5,150,238	15,704,693	17,697,838	138,405	17,836,243	1,242,139	560,911	585,014	400,005
1989	5,458,633	16,336,263	17,641,151	88,488	17,729,639	1,049,615	283,065	366,590	345,614
1990	6,440,643	18,959,051	19,995,760	99,868	20,095,628	1,298,537	229,083	469,502	202,412
1991	5,805,189	18,565,503	19,903,346	131,558	20,034,904	1,432,360	665,443	1,025,089	516,257
1992	6,471,964	19,838,439	18,194,788	279,610	18,474,398	1,167,898	666,181	666,181	696,623
1993	7,583,165	23,092,943	19,051,939	199,640	19,251,579	1,868,745	606,763	1,232,409	818,675
1994	7,142,378	19,069,838	17,354,702	204,963	17,559,665	1,699,479	763,493	1,145,700	587,350
1995	6,540,575	19,680,665	19,360,033	191,516	19,551,549	1,284,146	614,314	1,941,939	2,411,412
1996	7,065,052	20,408,184	19,041,451	237,846	19,279,297	1,163,708	576,674	1,335,804	1,713,145
1997	7,387,904	21,710,020	19,724,881	176,120	19,901,001	1,330,450	730,628	1,401,582	2,043,179
1998	7,530,927	20,885,007	23,227,152	182,754	23,409,906	1,513,656	309,052	7,568,901	508,300
1999	8,861,513	23,178,434	19,993,981	161,263	20,155,244	3,161,222	735,182	5,402,619	1,669,455
2000	12,513,923	28,361,774	23,354,261	244,634	23,598,895	1,880,082	716,863	1,366,204	1,418,178
2001	15,786,072	30,846,950	24,057,353	618,180	24,675,533	2,440,156	2,548,593	1,842,309	1,525,859
2002	11,469,741	28,319,510	20,749,651	472,725	21,222,376	1,406,393	802,084	758,769	585,111
2003	11,665,729	29,065,825	21,009,929	286,409	21,296,338	3,807,068	688,454	723,308	631,997
2004	14,831,045	34,096,973	26,803,612	249,698	27,053,310	1,910,337	1,386,867	1,336,967	1,052,461
2005	13,916,715	29,066,546	16,471,071	1,500,044	17,971,115	2,869,340	1,507,443	1,547,485	883,538
2006	13,810,904	30,497,990	14,975,584	311,220	15,286,804	4,480,237	1,329,743	1,216,863	2,935,392
2007	8,462,855	29,231,064	15,995,540	433,116	16,428,656	5,870,195	1,647,145	1,802,531	1,840,527
2008	10,946,346	38,580,909	23,375,279	405,362	23,780,641	2,313,261	1,393,657	1,277,038	850,205
2009	13,342,596	34,541,876	23,096,827	240,337	23,337,164	2,541,187	1,519,209	1,329,516	1,145,208
2010	9,491,626	27,732,775	14,381,726	372,516	14,754,242	3,418,331	1,675,085	2,607,464	1,753,048
2011	15,727,423	36,711,803	18,840,447	264,203	19,104,650	2,689,712	1,845,097	2,305,787	2,184,405
2012	16,543,107	43,209,157	30,327,713	284,640	30,612,353	2,827,963	1,364,656	1,904,499	2,334,962
2013	13,866,930	41,571,096	24,740,222	1,401,983	26,142,205	2,879,101	1,382,271	1,930,633	3,027,474
2014	12,562,597	37,401,743	18,612,744	1,021,866	19,634,610	4,717,086	1,376,054	1,911,127	1,484,701
2015	14,467,453	41,134,605	24,805,828	911,858	25,717,686	3,509,464	1,388,070	1,934,574	2,305,203
2016	14,612,128	41,545,953	25,053,887	920,977	25,974,864	3,544,559	1,401,951	1,953,920	2,328,255
2017	14,758,249	41,961,410	25,304,425	930,187	26,234,612	3,580,004	1,415,970	1,973,459	2,351,537
2018	14,905,831	42,381,025	25,557,470	939,489	26,496,959	3,615,804	1,430,130	1,993,194	2,375,053
2019	15,054,890	42,804,834	25,813,044	948,883	26,761,927	3,651,962	1,444,431	2,013,126	2,398,803
2020	15,205,439	43,232,885	26,071,175	958,372	27,029,547	3,688,482	1,458,876	2,033,257	2,422,791
2021	15,357,493	43,665,211	26,331,887	967,956	27,299,843	3,725,367	1,473,465	2,053,589	2,447,019
2022	15,511,068	44,101,865	26,595,205	977,636	27,572,841	3,762,621	1,488,199	2,074,125	2,471,489
2023	15,666,179	44,542,885	26,861,157	987,412	27,848,569	3,800,247	1,503,081	2,094,867	2,496,204
2024	15,822,840	44,988,313	27,129,769	997,286	28,127,055	3,838,249	1,518,112	2,115,815	2,521,166
2025	15,981,069	45,438,197	27,401,067	1,007,259	28,408,326	3,876,632	1,533,293	2,136,973	2,546,378
2026	16,140,879	45,892,577	27,675,077	1,017,331	28,692,408	3,915,398	1,548,626	2,158,343	2,571,842
2027	16,302,288	46,351,503	27,951,828	1,027,505	28,979,333	3,954,552	1,564,112	2,179,927	2,597,560
2028	16,465,311	46,815,019	28,231,346	1,037,780	29,269,126	3,994,098	1,579,753	2,201,726	2,623,536
2029	16,629,964	47,283,166	28,513,660	1,048,158	29,561,818	4,034,039	1,595,551	2,223,743	2,649,771
2030	16,796,264	47,756,000	28,798,797	1,058,639	29,857,436	4,074,379	1,611,506	2,245,981	2,676,269
2031	16,964,227	48,233,560	29,086,784	1,069,226	30,156,010	4,115,123	1,627,622	2,268,440	2,703,032
2032	17,133,869	48,715,895	29,377,652	1,079,918	30,457,570	4,156,274	1,643,898	2,291,125	2,730,062
2033	17,305,208	49,203,054	29,671,429	1,090,717	30,762,146	4,197,837	1,660,337	2,314,036	2,757,362
2034	17,478,260	49,695,087	29,968,143	1,101,624	31,069,767	4,239,815	1,676,940	2,337,176	2,784,936
2035	17,653,042	50,192,035	30,267,825	1,112,640	31,380,465	4,282,213	1,693,710	2,360,548	2,812,785
TOTAL	659,676,480	1,833,929,261	1,249,485,276	32,514,076	1,281,999,352	150,124,149	65,868,377	96,636,032	93,139,505

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 6 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	MOJAVE DIVISION (continued)						SANTA ANA DIVISION		
	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	Reach 28G
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	75,768	80,436	1,036,831	51,520	362,153	2,030,064	26	578	109
1973	60,641	66,539	1,283,816	65,475	353,262	2,323,148	20,541	679,328	136,352
1974	65,007	77,667	1,477,946	96,340	334,302	2,375,962	24,380	799,400	155,262
1975	135,462	77,825	1,630,554	111,141	419,450	2,794,186	29,337	885,021	110,729
1976	106,314	131,007	1,598,071	107,787	304,638	2,902,124	51,356	1,103,139	138,575
1977	98,757	86,279	1,882,080	71,228	48,359	2,800,647	62,584	1,412,740	127,543
1978	109,271	71,763	2,211,965	72,179	637,401	3,731,410	67,186	1,159,950	166,919
1979	203,078	121,586	2,104,832	76,960	202,566	3,571,387	84,462	1,235,189	142,586
1980	156,794	117,274	2,670,387	147,009	688,605	4,870,700	72,651	1,532,535	158,340
1981	181,062	119,602	3,030,407	134,895	47,750	5,032,502	35,662	1,575,444	160,053
1982	186,109	125,429	3,248,883	299,712	623,755	6,176,507	26,852	1,822,250	205,350
1983	219,943	140,523	3,899,769	223,626	384,292	6,472,986	19,017	1,663,599	244,720
1984	266,919	146,866	4,783,997	59,337	1,104,149	7,935,729	11,319	2,325,661	240,960
1985	799,514	125,780	5,330,501	261,135	811,346	8,941,007	17,764	2,707,662	451,606
1986	242,158	178,847	6,190,812	156,053	515,945	9,001,390	31,012	2,768,728	439,048
1987	298,190	236,263	5,731,239	151,796	732,607	10,146,593	19,362	2,847,390	278,094
1988	331,099	149,876	6,910,472	253,833	970,052	11,403,401	36,576	3,087,873	271,868
1989	194,047	138,825	5,963,386	349,544	1,242,144	9,932,830	30,881	3,190,809	230,953
1990	273,748	49,174	6,905,442	436,785	1,891,053	11,755,736	25,518	3,330,913	437,812
1991	478,555	231,223	7,488,366	263,723	1,561,051	13,662,067	32,172	3,847,589	843,388
1992	585,072	168,251	7,076,997	317,042	622,116	12,038,418	55,819	4,043,878	281,864
1993	509,309	207,818	7,765,751	359,632	1,708,915	15,078,017	72,464	5,638,325	382,195
1994	873,215	241,679	7,691,548	1,220,795	1,245,936	15,839,195	105,373	5,139,991	617,136
1995	355,198	179,930	6,994,639	842,041	746,371	15,369,990	96,781	4,357,648	1,308,828
1996	790,618	136,397	8,590,347	889,842	(78,782)	15,117,753	156,395	4,051,744	1,001,063
1997	640,177	189,241	8,138,580	1,586,227	3,355,446	19,415,490	177,217	4,585,198	493,841
1998	297,621	115,100	8,887,728	1,924,868	1,134,837	22,259,793	142,703	4,856,225	379,997
1999	1,397,331	188,734	9,546,515	2,035,924	1,230,967	25,367,949	190,409	6,055,156	505,937
2000	964,636	156,460	9,671,323	1,713,681	1,538,844	19,426,271	353,790	4,238,865	848,093
2001	1,070,806	475,954	7,688,027	1,893,242	26,977	19,511,923	298,329	2,437,078	1,668,195
2002	1,157,882	283,269	11,265,536	1,697,344	937,539	18,893,927	509,391	3,410,163	1,251,757
2003	482,423	289,505	13,524,464	2,134,205	(431,228)	21,850,196	371,352	3,844,968	558,498
2004	1,069,610	424,190	10,714,489	2,173,944	1,114,224	21,183,089	431,159	5,575,628	1,254,255
2005	682,834	356,280	7,683,479	2,428,022	2,253,045	20,211,466	453,656	5,654,386	1,524,316
2006	969,437	761,339	10,166,658	1,936,906	619,029	24,415,604	342,038	5,193,327	654,787
2007	841,683	669,691	10,052,237	3,003,678	716,361	26,444,052	312,481	8,072,228	860,259
2008	510,270	724,614	14,711,117	2,453,501	1,049,561	25,283,224	403,812	6,658,346	830,442
2009	759,472	550,754	12,310,519	3,500,094	1,558,931	25,214,890	579,971	7,278,914	684,513
2010	797,818	736,762	12,641,690	3,336,893	2,987,979	29,955,070	731,416	6,661,209	591,142
2011	658,004	628,809	13,339,545	4,143,416	3,407,228	31,202,003	542,345	6,139,864	833,228
2012	1,372,185	516,712	16,872,583	4,214,786	3,102,027	34,510,373	679,959	8,002,289	775,341
2013	567,100	2,611,800	16,844,891	4,263,692	1,447,233	34,954,195	692,830	11,700,485	788,609
2014	570,147	523,941	14,604,778	4,153,030	1,448,845	30,789,709	694,744	8,016,518	785,205
2015	844,842	1,229,660	16,268,491	4,252,607	2,019,362	33,752,273	696,070	9,332,162	790,883
2016	853,290	1,241,956	16,431,176	4,295,133	2,039,555	34,089,795	703,030	9,425,483	798,791
2017	861,823	1,254,376	16,595,488	4,338,084	2,059,951	34,430,692	710,061	9,519,738	806,779
2018	870,441	1,266,920	16,761,443	4,381,465	2,080,550	34,775,000	717,161	9,614,935	814,847
2019	879,146	1,279,589	16,929,057	4,425,280	2,101,356	35,122,750	724,333	9,711,085	822,996
2020	887,937	1,292,385	17,098,348	4,469,533	2,122,369	35,473,978	731,576	9,808,196	831,225
2021	896,817	1,305,309	17,269,331	4,514,228	2,143,593	35,828,718	738,892	9,906,278	839,538
2022	905,785	1,318,362	17,442,025	4,559,370	2,165,029	36,187,005	746,281	10,005,340	847,933
2023	914,843	1,331,545	17,616,445	4,604,964	2,186,679	36,548,875	753,744	10,105,394	856,412
2024	923,991	1,344,861	17,792,609	4,651,014	2,208,546	36,914,363	761,281	10,206,448	864,977
2025	933,231	1,358,309	17,970,535	4,697,524	2,230,632	37,283,507	768,894	10,308,512	873,626
2026	942,563	1,371,893	18,150,241	4,744,499	2,252,938	37,656,343	776,583	10,411,597	882,363
2027	951,989	1,385,611	18,331,743	4,791,944	2,275,467	38,032,905	784,349	10,515,713	891,186
2028	961,509	1,399,468	18,515,060	4,839,863	2,298,222	38,413,235	792,192	10,620,870	900,098
2029	971,124	1,413,462	18,700,211	4,888,262	2,321,204	38,797,367	800,114	10,727,079	909,099
2030	980,835	1,427,597	18,887,213	4,937,145	2,344,416	39,185,341	808,115	10,834,350	918,190
2031	990,643	1,441,873	19,076,085	4,986,516	2,367,860	39,577,194	816,197	10,942,693	927,372
2032	1,000,550	1,456,292	19,266,846	5,036,381	2,391,539	39,972,967	824,359	11,052,120	936,646
2033	1,010,555	1,470,855	19,459,515	5,086,745	2,415,454	40,372,696	832,602	11,162,642	946,012
2034	1,020,661	1,485,563	19,654,110	5,137,613	2,439,609	40,776,423	840,928	11,274,268	955,472
2035	1,030,868	1,500,419	19,850,651	5,188,989	2,464,005	41,184,188	849,337	11,387,011	965,027
TOTAL	42,038,727	42,186,319	700,229,820	154,440,042	91,905,617	1,436,568,588	25,269,191	386,460,145	42,198,780

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 7 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SANTA ANA DIVISION (continued)			SANTA ANA DIVISION - EAST BRANCH EXTENSION					
	Reach 28H	Reach 28J	Subtotal	Reach 1	Reach 2A	Reach 2B	Reach 2C	Reach 2D	Reach 3A
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	30	0	743	0	0	0	0	0	0
1973	79	0	836,300	0	0	0	0	0	0
1974	34,693	854,637	1,868,372	0	0	0	0	0	0
1975	69,082	723,814	1,817,983	0	0	0	0	0	0
1976	100,400	635,853	2,029,323	0	0	0	0	0	0
1977	92,647	825,880	2,521,394	0	0	0	0	0	0
1978	68,363	835,082	2,297,500	0	0	0	0	0	0
1979	92,812	265,525	1,820,574	0	0	0	0	0	0
1980	129,897	1,120,131	3,013,554	0	0	0	0	0	0
1981	111,722	333,550	2,216,431	0	0	0	0	0	0
1982	135,463	1,518,759	3,708,674	0	0	0	0	0	0
1983	124,651	412,806	2,464,793	0	0	0	0	0	0
1984	190,924	769,068	3,537,468	0	0	0	0	0	0
1985	182,242	871,492	4,230,760	0	0	0	0	0	0
1986	256,526	982,332	4,477,646	0	0	0	0	0	0
1987	218,717	1,118,529	4,482,092	0	0	0	0	0	0
1988	200,811	1,176,659	4,773,787	0	0	0	0	0	0
1989	281,861	1,130,035	4,864,539	0	0	0	0	0	0
1990	308,144	1,538,449	5,640,836	0	0	0	0	0	0
1991	632,912	1,630,321	6,986,382	0	0	0	0	0	0
1992	5,636,464	1,102,519	11,120,544	0	0	0	0	0	0
1993	570,563	994,721	7,658,268	0	0	0	0	0	0
1994	415,603	1,022,412	7,300,515	0	0	0	0	0	0
1995	704,154	894,338	7,361,749	0	0	0	0	0	0
1996	1,041,697	1,316,493	7,567,392	0	0	0	0	0	0
1997	949,188	953,590	7,159,034	0	0	0	0	0	0
1998	991,426	(67,444)	6,302,907	0	0	0	0	0	0
1999	1,972,630	1,091,945	9,816,077	0	0	0	0	0	0
2000	1,006,982	1,129,659	7,577,389	0	0	0	0	0	0
2001	811,163	5,682,760	10,897,525	0	0	0	0	0	0
2002	423,326	2,245,240	7,839,877	0	0	0	0	0	0
2003	381,499	1,366,976	6,523,293	1,022	84,351	375,153	2,329	0	627,038
2004	447,022	3,672,448	11,380,512	10,740	40,841	509,089	2,039	0	276,019
2005	686,731	(1,870,558)	6,448,531	9,849	15,079	526,273	4,153	0	496,547
2006	339,521	5,229,263	11,758,936	9,948	10,190	532,526	9,248	44,735	394,360
2007	729,211	3,316,107	13,290,296	28,887	9,813	640,746	5,038	100,297	603,808
2008	808,863	4,642,088	13,343,551	75,265	34,251	813,861	1,295	173,891	1,276,949
2009	657,482	2,697,963	11,898,843	77,298	18,179	960,569	910	174,765	833,308
2010	481,015	3,641,514	12,106,296	53,873	4,268	788,395	14,693	235,035	1,003,836
2011	640,265	4,925,640	13,081,342	24,626	6,196	708,899	4,094	256,207	748,680
2012	656,505	2,254,856	12,368,950	56,164	16,211	885,837	7,295	234,709	942,925
2013	667,451	1,204,140	15,053,515	57,315	10,352	904,615	7,423	240,471	954,610
2014	663,423	1,190,915	11,350,805	57,821	5,913	915,121	7,402	246,377	955,048
2015	669,085	1,565,470	13,053,670	57,671	10,933	910,877	7,447	242,924	960,370
2016	675,775	1,581,124	13,184,203	58,248	11,043	919,985	7,521	245,353	969,973
2017	682,533	1,596,936	13,316,047	58,830	11,153	929,185	7,596	247,807	979,673
2018	689,359	1,612,905	13,449,207	59,418	11,265	938,477	7,672	250,285	989,470
2019	696,252	1,629,034	13,583,700	60,013	11,377	947,862	7,749	252,788	999,364
2020	703,215	1,645,324	13,719,536	60,613	11,491	957,340	7,827	255,316	1,009,358
2021	710,247	1,661,778	13,856,733	61,219	11,606	966,914	7,905	257,869	1,019,452
2022	717,349	1,678,395	13,995,298	61,831	11,722	976,583	7,984	260,448	1,029,646
2023	724,523	1,695,179	14,135,252	62,449	11,839	986,349	8,064	263,052	1,039,943
2024	731,768	1,712,131	14,276,605	63,074	11,958	996,212	8,144	265,683	1,050,342
2025	739,086	1,729,252	14,419,370	63,705	12,077	1,006,174	8,226	268,339	1,060,846
2026	746,477	1,746,545	14,563,565	64,342	12,198	1,016,236	8,308	271,023	1,071,454
2027	753,941	1,764,010	14,709,199	64,985	12,320	1,026,399	8,391	273,733	1,082,169
2028	761,481	1,781,651	14,856,292	65,635	12,443	1,036,663	8,475	276,470	1,092,990
2029	769,095	1,799,467	15,004,854	66,291	12,567	1,047,029	8,560	279,235	1,103,920
2030	776,786	1,817,462	15,154,903	66,954	12,693	1,057,499	8,645	282,027	1,114,959
2031	784,554	1,835,636	15,306,452	67,624	12,820	1,068,074	8,732	284,848	1,126,109
2032	792,400	1,853,993	15,459,518	68,300	12,948	1,078,755	8,819	287,696	1,137,370
2033	800,324	1,872,533	15,614,113	68,983	13,078	1,089,543	8,907	290,573	1,148,744
2034	808,327	1,891,258	15,770,253	69,673	13,209	1,100,438	8,996	293,479	1,160,231
2035	816,410	1,910,171	15,927,956	70,370	13,341	1,111,443	9,086	296,414	1,171,833
TOTAL	40,463,147	101,760,761	596,152,024	1,803,036	509,725	29,729,121	238,973	7,351,849	31,431,344

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 8 of 9

Calendar	CALIFORNIA AQUEDUCT (continued)										
	SANTA ANA DIVISION - EAST BRANCH EXTENSION (cont)				WEST BRANCH						
	Year	Reach 3B	Reach 4A	Reach 4B	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	Reach 30
	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]
1961	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	719,255	159,249	199,145	234,196	88,198	420,789	1,820,832
1973	0	0	0	0	779,949	339,363	122,664	264,850	119,743	621,431	2,248,000
1974	0	0	0	0	883,312	158,366	112,458	350,160	(4,525)	723,949	2,223,720
1975	0	0	0	0	1,049,990	176,676	194,724	801,457	75,870	841,991	3,140,708
1976	0	0	0	0	1,220,429	215,588	202,591	624,614	98,268	(650,944)	1,710,546
1977	0	0	0	0	1,268,813	116,939	218,129	684,679	184	634,581	2,923,325
1978	0	0	0	0	1,174,708	342,479	267,308	415,641	17,764	3,088,954	5,306,854
1979	0	0	0	0	1,366,942	285,575	284,188	972,584	29,850	958,068	3,897,207
1980	0	0	0	0	1,698,215	224,472	455,619	874,259	288,303	222,549	3,763,417
1981	0	0	0	0	1,783,405	123,264	615,047	2,305,110	8,794	1,093,897	5,929,517
1982	0	0	0	0	1,919,979	190,500	702,265	2,208,264	414,230	978,624	6,413,862
1983	0	0	0	0	2,739,814	149,333	888,475	745,939	579,882	3,698,681	8,802,124
1984	0	0	0	0	3,463,038	81,260	2,358,495	537,207	719,282	755,136	7,914,418
1985	0	0	0	0	3,866,946	295,836	3,047,591	975,729	614,735	1,753,355	10,554,192
1986	0	0	0	0	3,791,427	457,604	2,893,171	1,480,015	1,032,216	1,338,657	10,993,090
1987	0	0	0	0	3,423,494	213,106	2,933,342	944,604	459,398	1,406,519	9,380,463
1988	0	0	0	0	3,447,403	255,113	3,017,463	883,714	446,468	1,452,589	9,502,750
1989	0	0	0	0	4,025,641	405,583	2,738,143	1,398,165	865,738	1,505,029	10,938,299
1990	0	0	0	0	4,088,481	383,655	3,232,445	3,153,869	777,713	847,500	12,483,663
1991	0	0	0	0	3,862,056	304,143	3,550,063	639,527	763,037	1,191,090	10,309,916
1992	0	0	0	0	4,286,050	327,802	3,892,480	1,014,551	872,953	2,259,032	12,652,868
1993	0	0	0	0	3,969,075	343,304	4,515,385	1,670,952	852,208	1,157,876	12,508,800
1994	0	0	0	0	3,649,861	293,376	3,359,381	1,879,417	872,624	1,674,576	11,729,235
1995	0	0	0	0	4,137,046	883,315	4,750,275	1,588,080	754,904	(421,879)	11,691,741
1996	0	0	0	0	4,511,858	966,044	3,593,671	4,208,195	877,111	1,574,098	15,730,977
1997	0	0	0	0	4,543,506	1,030,809	2,429,066	3,755,901	1,597,361	1,521,491	14,878,134
1998	0	0	0	0	4,871,761	464,376	3,473,405	2,398,630	1,996,114	1,291,185	14,495,471
1999	0	0	0	0	4,877,840	4,252,041	5,005,853	1,770,699	1,006,873	1,918,917	18,832,223
2000	0	0	0	0	5,482,502	769,046	4,301,519	2,181,143	173,108	1,575,042	14,482,360
2001	0	0	0	0	5,908,785	1,532,127	5,138,147	4,390,651	240,853	(938,450)	16,272,113
2002	0	0	0	0	5,337,368	1,491,192	4,078,059	4,482,867	(48,511)	3,473,975	18,814,950
2003	360	93,305	33,614	1,217,172	4,589,260	1,325,524	3,837,744	3,401,543	(581,700)	974,656	13,547,027
2004	337	13,434	71,444	923,943	9,074,729	1,388,321	3,621,361	5,177,822	(560,699)	1,534,831	20,236,365
2005	9,036	27,330	216,418	1,304,885	5,815,155	2,602,278	7,432,338	(575,087)	2,664,966	(1,232,048)	16,707,602
2006	989	14,574	69,398	1,085,968	6,934,274	2,322,681	5,198,895	3,595,565	916,529	(4,203,838)	14,764,106
2007	58,374	37,458	133,635	1,618,056	5,723,997	2,760,698	10,538,128	7,868,470	913,748	12,221,631	40,026,672
2008	90,585	74,762	218,742	2,759,601	8,272,235	867,928	16,378,952	7,501,472	(11,765)	631,188	33,640,010
2009	26,785	133,396	192,449	2,417,659	7,856,822	921,438	8,636,832	5,597,698	610,863	2,921,553	26,545,206
2010	13,969	854,442	255,378	2,523,889	9,823,968	171,498	9,037,001	6,490,533	563,117	5,562,040	32,348,157
2011	15,600	73,407	463,694	2,301,403	7,050,147	977,461	9,657,339	8,301,680	(1,939,999)	(126,447)	23,920,181
2012	19,718	133,147	348,632	2,644,638	9,025,475	1,391,061	9,718,869	3,661,043	(259,672)	1,675,834	25,212,610
2013	20,080	135,588	351,637	2,682,091	9,084,945	1,407,501	7,694,092	3,552,355	(267,912)	1,465,728	22,936,709
2014	20,092	135,649	341,719	2,685,142	9,832,705	1,397,984	7,392,438	3,526,020	(281,839)	1,446,397	23,313,687
2015	20,163	136,143	350,803	2,697,331	9,407,519	1,412,837	8,351,151	3,615,598	(272,506)	1,544,612	24,059,211
2016	20,364	137,504	354,311	2,724,302	9,501,594	1,426,966	8,434,662	3,651,754	(275,231)	1,560,058	24,299,803
2017	20,568	138,879	357,854	2,751,545	9,596,610	1,441,236	8,519,009	3,688,272	(277,983)	1,575,659	24,542,803
2018	20,774	140,268	361,433	2,779,062	9,692,576	1,455,648	8,604,199	3,725,154	(280,763)	1,591,415	24,788,229
2019	20,981	141,671	365,047	2,806,852	9,789,502	1,470,204	8,690,241	3,762,406	(283,571)	1,607,330	25,036,112
2020	21,191	143,088	368,698	2,834,922	9,887,397	1,484,906	8,777,143	3,800,030	(286,407)	1,623,403	25,286,472
2021	21,403	144,518	372,385	2,863,271	9,986,271	1,499,755	8,864,915	3,838,030	(289,271)	1,639,637	25,539,337
2022	21,617	145,964	376,109	2,891,904	10,086,133	1,514,753	8,953,564	3,876,410	(292,163)	1,656,033	25,794,730
2023	21,833	147,423	379,870	2,920,822	10,186,995	1,529,901	9,043,099	3,915,175	(295,085)	1,672,594	26,052,679
2024	22,052	148,898	383,668	2,950,031	10,288,865	1,545,200	9,133,530	3,954,326	(298,036)	1,689,320	26,313,205
2025	22,272	150,387	387,505	2,979,531	10,391,753	1,560,652	9,224,866	3,993,870	(301,016)	1,706,213	26,576,338
2026	22,495	151,890	391,380	3,009,326	10,495,671	1,576,258	9,317,114	4,033,808	(304,026)	1,723,275	26,842,100
2027	22,720	153,409	395,294	3,039,420	10,600,628	1,592,021	9,410,286	4,074,146	(307,067)	1,740,508	27,110,522
2028	22,947	154,943	399,247	3,069,813	10,706,634	1,607,941	9,504,388	4,114,888	(310,137)	1,757,913	27,381,627
2029	23,176	156,493	403,239	3,100,510	10,813,700	1,624,020	9,599,432	4,156,037	(313,239)	1,775,492	27,655,442
2030	23,408	158,058	407,272	3,131,515	10,921,837	1,640,260	9,695,427	4,197,597	(316,371)	1,793,247	27,931,997
2031	23,642	159,638	411,344	3,162,831	11,031,056	1,656,663	9,792,381	4,239,573	(319,535)	1,811,179	28,211,317
2032	23,879	161,235	415,458	3,194,460	11,141,366	1,673,230	9,890,305	4,281,969	(322,730)	1,829,291	28,493,431
2033	24,117	162,847	419,612	3,226,404	11,252,780	1,689,962	9,989,208	4,324,788	(325,957)	1,847,584	28,778,365
2034	24,359	164,476	423,809	3,258,770	11,365,308	1,706,862	10,089,100	4,368,036	(329,217)	1,866,060	29,066,149
2035	24,602	166,120	428,047	3,291,256	11,478,961	1,723,930	10,189,991	4,411,717	(332,509)	1,884,720	29,356,810
TOTAL	744,488	4,190,344	10,849,145	86,848,025	409,855,817	68,299,114	365,788,567	191,958,349	12,023,563	96,735,376	1,144,660,786

TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge

(in dollars)

Sheet 9 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)						Total	GRAND TOTAL
	COASTAL BRANCH							
	Reach 31A (a)	Reach 33A	Reach 33B	Reach 34	Reach 35	Subtotal		
[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	42,918
1963	0	0	0	0	0	0	0	168,358
1964	0	0	0	0	0	0	0	184,729
1965	0	0	0	0	0	0	0	378,874
1966	0	0	0	0	0	0	0	408,397
1967	0	0	0	0	0	0	0	634,505
1968	0	0	0	0	0	0	2,160,548	2,745,160
1969	509,728	0	0	0	0	509,728	3,324,718	4,074,939
1970	609,988	0	0	0	0	609,988	3,983,062	4,676,282
1971	699,052	0	0	0	0	699,052	5,614,013	6,185,714
1972	697,576	0	0	0	0	697,576	12,353,356	12,998,869
1973	641,626	0	0	0	0	641,626	14,590,688	15,194,233
1974	669,279	0	0	0	0	669,279	16,598,762	17,372,561
1975	806,429	0	0	0	0	806,429	19,569,999	20,517,423
1976	840,927	0	0	0	0	840,927	19,002,859	20,027,213
1977	872,169	0	0	0	0	872,169	23,267,885	24,213,489
1978	934,119	0	0	0	0	934,119	24,818,739	26,012,786
1979	871,688	0	0	0	0	871,688	23,421,881	24,675,598
1980	1,047,396	4,790	0	30	75	1,052,291	30,105,348	32,038,398
1981	1,037,469	4,790	0	30	75	1,042,364	33,884,524	35,516,366
1982	1,015,555	4,790	0	30	75	1,020,450	39,515,188	41,611,655
1983	1,146,269	4,957	0	30	77	1,151,333	54,543,263	56,802,781
1984	1,427,192	5,051	0	31	78	1,432,352	63,947,633	67,105,188
1985	1,849,827	5,051	0	31	78	1,854,987	69,700,009	73,272,898
1986	1,714,723	5,051	0	31	78	1,719,883	73,437,761	76,707,917
1987	1,689,141	4,324	0	26	67	1,693,558	71,443,424	75,217,576
1988	1,964,428	4,509	0	28	70	1,969,035	72,349,117	76,060,618
1989	1,768,942	4,509	0	28	70	1,773,549	73,894,076	78,662,348
1990	2,274,772	0	0	0	0	2,274,772	86,130,115	91,361,385
1991	2,187,841	0	0	0	0	2,187,841	86,877,284	90,982,870
1992	2,465,364	0	0	0	0	2,465,364	94,167,321	99,235,524
1993	2,811,441	0	0	0	0	2,811,441	100,019,568	107,299,130
1994	3,894,639	0	0	0	0	3,894,639	92,336,811	99,944,106
1995	3,481,049	0	0	0	0	3,481,049	98,887,435	105,659,504
1996	5,144,684	0	0	0	0	5,144,684	105,119,193	112,018,784
1997	2,523,741	(33)	0	0	0	2,523,708	107,647,058	113,385,326
1998	4,302,712	1,878,365	1,386	160,400	88,026	6,430,889	120,649,996	127,316,519
1999	4,247,118	1,957,943	16,646	184,325	87,373	6,493,405	127,171,443	136,479,879
2000	2,904,033	2,533,780	20,786	253,538	109,328	5,821,465	122,587,315	131,288,015
2001	3,116,795	2,241,988	14,426	153,879	58,875	5,585,963	135,980,749	143,336,320
2002	3,178,461	2,690,064	49,511	189,458	81,857	6,189,351	125,073,018	136,694,081
2003	3,368,380	2,817,400	44,211	200,986	85,015	6,515,992	128,163,251	137,171,164
2004	3,578,779	2,717,353	69,895	240,426	109,830	6,716,283	146,915,798	157,118,106
2005	3,856,336	2,991,661	120,379	292,354	137,878	7,398,608	123,189,882	131,317,608
2006	2,542,352	3,233,309	110,280	203,484	112,691	6,202,116	130,312,980	138,357,037
2007	3,211,733	3,085,107	128,889	117,474	83,237	6,626,440	160,570,726	170,260,531
2008	5,580,473	4,367,557	158,215	127,350	86,286	10,319,881	181,419,973	191,992,951
2009	5,157,989	3,842,821	126,090	118,036	76,407	9,321,343	161,418,995	171,741,874
2010	6,472,619	6,541,446	203,619	168,652	110,769	13,497,105	163,977,249	175,676,744
2011	6,128,146	5,877,682	146,747	172,517	106,314	12,431,406	172,756,894	185,569,060
2012	7,100,551	6,045,491	0	0	0	13,146,042	199,775,525	212,433,079
2013	6,714,648	5,474,330	0	0	0	12,188,978	211,721,585	211,721,585
2014	6,365,630	5,301,841	0	0	0	11,667,471	172,147,665	185,299,097
2015	6,794,212	5,663,293	0	0	0	12,457,505	191,755,023	205,182,768
2016	6,862,155	5,719,926	0	0	0	12,582,081	193,672,571	207,234,594
2017	6,930,776	5,777,125	0	0	0	12,707,901	195,609,294	209,306,937
2018	7,000,084	5,834,897	0	0	0	12,834,981	197,565,390	211,400,010
2019	7,070,085	5,893,246	0	0	0	12,963,331	199,541,042	213,514,006
2020	7,140,786	5,952,178	0	0	0	13,092,964	201,536,456	215,649,150
2021	7,212,193	6,011,700	0	0	0	13,223,893	203,551,821	217,805,642
2022	7,284,315	6,071,817	0	0	0	13,356,132	205,587,337	219,983,699
2023	7,357,158	6,132,535	0	0	0	13,489,693	207,643,213	222,183,536
2024	7,430,730	6,193,860	0	0	0	13,624,590	209,719,643	224,405,369
2025	7,505,037	6,255,799	0	0	0	13,760,836	211,816,841	226,649,426
2026	7,580,088	6,318,357	0	0	0	13,898,445	213,935,008	228,915,918
2027	7,655,889	6,381,541	0	0	0	14,037,430	216,074,359	231,205,078
2028	7,732,448	6,445,356	0	0	0	14,177,804	218,235,103	233,517,128
2029	7,809,772	6,509,810	0	0	0	14,319,582	220,417,448	235,852,297
2030	7,887,870	6,574,908	0	0	0	14,462,778	222,621,624	238,210,818
2031	7,966,748	6,640,657	0	0	0	14,607,405	224,847,843	240,592,930
2032	8,046,416	6,707,063	0	0	0	14,753,479	227,096,323	242,998,861
2033	8,126,880	6,774,134	0	0	0	14,901,014	229,367,286	245,428,851
2034	8,208,149	6,841,875	0	0	0	15,050,024	231,660,961	247,883,141
2035	8,290,230	6,910,294	0	0	0	15,200,524	233,977,569	250,361,970
TOTAL	283,315,830	195,256,298	1,211,080	2,583,174	1,334,629	483,701,011	8,548,701,434	9,125,450,201

(a) Includes certain costs to be assigned directly to Kern County Water Agency. Refer to Appendix B text discussion of Table B-16A under "Project Water Charges."

Tables B-12 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge^a

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AQUEDUCT				SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT		
	Reach 1	Reach 3A	Reach 3B	Total	Reach 1	Reach 1	Reach 4	Reach 14A
	Barker Slough Pumping Plant	Cordelia Pumping Plant (Solano)	Cordelia Pumping Plant (Napa) (b)		South Bay & Del Valle Pumping Plants (c)	Banks Pumping Plant	Dos Amigos Pumping Plant	Buena Vista Pumping Plant
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1962	0	0	0	0	36,970	0	0	0
1963	0	0	0	0	57,711	0	0	0
1964	0	0	0	0	74,134	0	0	0
1965	0	0	0	0	142,609	0	0	0
1966	0	0	0	0	192,605	0	0	0
1967	0	0	0	0	223,117	13,881	0	0
1968	0	0	6,989	6,989	336,671	452,630	202,947	0
1969	0	0	8,551	8,551	257,579	293,741	135,425	0
1970	0	0	13,598	13,598	396,358	346,215	211,197	1
1971	0	0	10,609	10,609	381,662	574,015	225,188	115,801
1972	0	0	14,434	14,434	598,702	933,292	502,196	198,914
1973	0	0	14,449	14,449	493,490	688,030	381,232	263,468
1974	0	0	17,473	17,473	565,575	783,562	447,772	315,939
1975	0	0	14,779	14,779	349,758	1,341,019	518,816	508,060
1976	0	0	20,856	20,856	571,361	1,638,453	641,115	712,947
1977	0	0	22,635	22,635	512,996	1,013,307	284,828	267,467
1978	0	0	21,692	21,692	586,355	2,339,502	607,042	689,236
1979	0	0	16,237	16,237	605,136	3,554,256	1,008,564	776,016
1980	0	0	19,945	19,945	523,369	2,083,336	1,129,152	1,051,629
1981	0	0	23,842	23,842	567,692	3,952,931	1,939,189	1,336,867
1982	0	0	12,157	12,157	605,780	3,082,031	1,363,705	1,200,226
1983	0	0	2,342	2,342	82,222	1,001,612	396,086	450,801
1984	0	0	4,822	4,822	271,543	1,856,959	976,773	823,681
1985	0	0	10,188	10,188	451,020	3,186,029	1,621,418	1,409,980
1986	0	0	15,501	15,501	814,111	6,595,625	2,627,407	2,405,224
1987	0	0	27,223	27,223	888,558	5,740,403	2,518,308	2,231,491
1988	17,813	0	24,020	41,833	911,176	6,276,214	2,610,048	2,560,122
1989	29,819	43,846	26,519	100,184	1,163,619	9,847,706	3,953,735	4,042,211
1990	52,210	67,109	40,775	160,094	1,834,626	10,460,533	4,498,260	5,779,750
1991	10,429	10,118	5,252	25,799	420,688	1,882,952	491,071	904,541
1992	13,319	13,070	9,406	35,795	339,021	3,129,419	1,147,502	1,221,282
1993	(11,941)	(8,753)	(5,392)	(26,086)	(150,856)	497,455	326,100	(108,089)
1994	46,791	39,624	29,189	115,604	801,374	5,677,009	2,305,603	2,523,572
1995	20,014	20,620	11,791	52,425	302,558	3,805,713	1,451,578	815,572
1996	57,320	47,288	23,483	128,091	718,807	8,192,821	4,009,531	2,493,264
1997	67,416	52,935	21,955	142,306	1,038,568	6,900,694	2,845,506	2,589,077
1998	(11,427)	(10,141)	(4,879)	(26,447)	(130,734)	185,756	(336,341)	(263,072)
1999	31,419	25,288	11,623	68,330	408,566	6,753,244	2,307,304	1,581,950
2000	50,433	37,119	13,165	100,717	794,515	7,122,082	2,646,446	2,569,710
2001	354,481	248,213	212,397	815,091	4,034,076	23,596,357	9,635,632	14,440,329
2002	189,982	104,564	61,470	356,016	2,324,926	17,025,395	6,894,112	8,423,370
2003	177,858	118,373	97,750	393,981	2,568,591	21,141,512	8,872,100	10,391,963
2004	248,084	138,880	106,974	493,938	2,548,576	21,459,794	9,281,189	12,219,983
2005	282,942	147,306	148,650	578,898	2,825,713	28,204,296	12,410,962	11,465,225
2006	225,730	111,129	143,928	480,787	2,685,732	22,534,358	10,093,509	10,870,200
2007	441,358	223,442	253,999	918,799	4,195,137	24,693,594	10,701,000	15,892,495
2008	400,736	183,644	288,970	873,350	3,181,335	16,462,755	5,763,706	10,618,456
2009	233,008	110,991	173,380	517,379	2,667,427	9,806,921	4,369,161	7,374,263
2010	273,938	110,820	232,451	617,209	2,484,133	25,271,238	9,745,797	10,535,065
2011	306,492	115,784	274,022	696,298	3,859,391	38,243,627	16,308,060	15,084,693
2012	942,270	1,049,281	615,107	2,606,659	6,380,402	31,450,736	13,128,882	15,733,147
2013	819,839	397,113	778,259	1,995,210	5,361,951	46,348,659	14,072,756	17,527,801
2014	998,812	567,535	603,917	2,170,264	5,967,019	42,328,949	15,506,993	19,451,561
2015	231,635	220,926	212,887	665,448	5,231,423	28,565,045	12,866,151	15,304,050
2016	330,613	245,364	212,887	788,864	5,231,423	28,557,804	13,537,844	16,473,807
2017	333,879	247,749	212,887	794,515	5,349,807	26,615,106	13,411,744	16,220,413
2018	423,609	247,749	434,399	1,105,757	5,349,807	29,392,405	14,638,547	18,170,248
2019	424,562	247,749	434,399	1,106,710	5,349,807	29,043,077	14,228,176	17,436,515
2020	424,562	247,749	434,399	1,106,710	5,349,807	29,456,869	14,750,936	18,348,479
2021	424,562	247,749	434,399	1,106,710	5,349,807	29,351,083	14,461,479	17,895,012
2022	424,562	247,749	434,399	1,106,710	5,349,807	30,085,217	14,732,891	18,381,778
2023	424,562	247,749	434,399	1,106,710	5,349,807	29,543,694	14,867,083	18,628,904
2024	424,562	247,749	434,399	1,106,710	5,349,807	29,527,256	14,466,631	17,929,521
2025	424,562	247,749	434,399	1,106,710	5,349,807	29,751,013	14,775,223	18,474,778
2026	424,562	247,749	434,399	1,106,710	5,349,807	28,329,097	14,105,932	17,311,823
2027	424,562	247,749	434,399	1,106,710	5,349,807	29,679,202	14,796,176	18,522,154
2028	424,562	247,749	434,399	1,106,710	5,349,807	29,745,276	14,888,814	18,685,361
2029	424,562	247,749	434,399	1,106,710	5,349,807	29,294,212	14,629,141	18,247,842
2030	424,562	247,749	434,399	1,106,710	5,349,807	29,423,607	14,480,633	17,984,829
2031	424,562	247,749	434,399	1,106,710	5,349,807	29,732,958	14,737,665	18,466,468
2032	424,562	247,749	434,399	1,106,710	5,349,807	29,185,228	14,169,119	17,464,910
2033	424,562	247,749	434,399	1,106,710	5,349,807	28,964,221	14,666,677	18,351,609
2034	424,562	247,749	434,399	1,106,710	5,349,807	28,304,894	13,743,757	16,753,398
2035	424,562	247,749	434,399	1,106,710	5,349,807	26,637,599	13,812,689	16,905,039
TOTAL	14,806,435	9,138,719	12,954,346	36,899,500	182,232,599	1,089,953,481	493,545,870	593,453,127

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."
 (b) Costs for the period 1968 through 1987 are for an interim facility.
 (c) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedures.

TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge^a

(in dollars)

Sheet 2 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 15A	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 24
	Wheeler Ridge Pumping Plant	Chrisman Pumping Plant	Edmonston Pumping Plant	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Silverwood Lake (d)
	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	2,564	0	0	0	0	0	0
1972	68,304	142,902	542,625	0	3,468	0	0
1973	236,623	387,198	1,548,428	0	202,289	0	0
1974	324,966	564,464	2,164,223	0	324,993	0	0
1975	552,952	1,095,331	4,010,395	0	575,061	0	0
1976	713,875	1,506,985	5,443,936	0	889,544	0	0
1977	303,107	657,108	2,360,624	0	315,128	0	0
1978	616,104	1,132,296	4,180,131	0	1,508,115	0	0
1979	749,188	1,526,850	5,475,688	0	1,838,687	0	0
1980	1,047,495	2,102,439	7,028,235	0	1,762,063	0	0
1981	1,319,739	2,838,773	9,351,931	0	2,296,771	0	0
1982	1,213,660	2,424,920	8,352,207	0	1,498,620	0	0
1983	432,165	793,915	2,375,225	0	397,766	0	0
1984	770,618	1,479,784	4,585,198	0	624,213	0	0
1985	1,411,621	2,812,461	9,365,591	0	1,226,515	0	0
1986	2,432,322	4,999,949	16,956,023	(1,013,756)	2,359,599	0	0
1987	2,213,047	4,434,510	14,612,448	(1,017,868)	1,814,728	0	243,983
1988	2,557,952	5,120,998	16,801,811	(742,800)	2,370,395	0	37,927
1989	4,061,396	8,559,270	28,732,499	(788,139)	4,228,697	0	50,884
1990	6,013,924	13,616,111	48,319,508	(832,947)	6,490,357	0	187,259
1991	1,032,050	2,427,880	8,647,065	(269,625)	996,352	0	0
1992	1,274,895	2,560,253	8,575,989	(916,154)	1,142,454	0	317,172
1993	(86,676)	(490,235)	(2,223,221)	(55,346)	(245,059)	0	(79,954)
1994	2,537,943	5,323,430	18,470,003	(59,356)	2,605,813	0	0
1995	725,389	1,435,098	4,738,967	(1,187,312)	972,086	0	777,343
1996	2,299,388	4,875,010	17,027,386	(2,788,262)	2,647,473	(914,092)	1,053,254
1997	2,417,154	5,424,334	19,413,834	(2,488,338)	3,037,087	(1,680,469)	0
1998	(236,322)	(524,933)	(1,809,182)	(1,969,187)	(431,135)	(1,217,950)	(149,186)
1999	1,288,328	3,316,481	12,854,526	(2,851,993)	1,861,548	(2,533,429)	71,918
2000	2,631,092	6,054,611	21,844,438	(5,070,499)	3,416,181	(4,371,927)	1,918
2001	14,791,724	33,305,001	123,028,536	(3,276,174)	18,743,460	(3,621,886)	921,915
2002	8,731,681	19,721,183	72,470,283	(4,919,131)	10,667,925	(5,247,076)	95,264
2003	10,812,755	24,631,703	90,634,635	(3,362,477)	14,522,523	(6,610,346)	231,965
2004	12,929,748	29,292,672	107,892,928	(6,248,061)	16,949,136	(7,691,613)	0
2005	11,727,298	26,579,367	94,593,622	(5,791,742)	17,525,724	(6,359,950)	0
2006	11,040,389	25,160,278	84,645,694	(4,019,245)	16,390,512	(6,342,354)	0
2007	16,415,108	37,114,090	127,172,033	(2,976,651)	19,664,918	(5,872,113)	0
2008	11,668,455	23,543,129	81,525,756	(3,305,736)	11,145,569	(3,203,162)	323,249
2009	7,827,365	16,957,435	64,524,883	(3,096,612)	8,268,043	(2,225,065)	1,954
2010	10,698,620	24,150,978	88,034,278	(4,904,985)	16,552,153	(5,529,305)	0
2011	15,121,597	33,909,710	113,524,293	(6,340,408)	23,114,233	(7,675,669)	504,323
2012	18,244,249	38,711,388	133,375,211	(3,731,160)	25,897,124	(13,278,554)	0
2013	20,219,950	42,866,456	147,655,179	(7,149,560)	28,243,482	(12,556,388)	0
2014	22,472,063	47,686,514	164,519,443	(7,319,047)	31,723,360	(12,918,203)	0
2015	14,858,517	34,821,276	129,646,523	(7,225,053)	25,830,482	(9,446,638)	0
2016	16,063,245	37,706,491	140,578,220	(7,661,043)	27,336,823	(11,014,562)	3,676,209
2017	15,803,439	37,087,821	138,238,185	(7,520,515)	26,323,723	(9,790,943)	0
2018	17,813,228	41,901,320	156,482,400	(7,964,846)	28,247,383	(10,328,174)	6,437,103
2019	17,055,167	40,086,318	149,597,024	(7,517,151)	26,241,620	(9,943,539)	0
2020	17,995,603	42,339,417	158,136,640	(7,785,030)	27,422,062	(10,411,087)	0
2021	17,528,356	41,219,684	153,892,539	(7,823,383)	27,658,956	(10,670,946)	141,481
2022	18,030,140	42,422,164	158,450,715	(7,701,044)	27,046,918	(10,574,564)	3,502,253
2023	18,285,815	43,035,291	160,776,456	(8,039,730)	28,591,724	(10,503,969)	2,127,969
2024	17,563,659	41,304,179	154,212,701	(7,635,407)	26,846,374	(9,964,424)	0
2025	18,126,584	42,653,478	159,328,544	(7,897,989)	27,898,447	(10,304,295)	3,339,423
2026	16,926,991	39,778,476	148,430,551	(7,624,836)	26,836,415	(10,234,324)	0
2027	18,175,638	42,771,201	159,775,312	(7,836,910)	27,499,982	(10,614,725)	1,420,404
2028	18,342,841	43,171,860	161,290,928	(7,935,383)	28,119,884	(10,965,371)	0
2029	17,892,617	42,092,625	157,202,481	(7,827,698)	27,611,739	(10,182,088)	773,576
2030	17,620,704	41,441,058	154,731,017	(7,677,691)	27,046,208	(10,181,183)	0
2031	18,118,848	42,633,742	159,260,030	(7,938,866)	28,102,439	(10,692,340)	6,323,218
2032	17,083,988	40,156,069	149,861,382	(7,448,937)	25,907,431	(9,659,030)	0
2033	18,000,378	42,349,767	158,183,428	(7,949,103)	28,071,453	(10,594,888)	3,127,525
2034	16,352,085	38,402,542	143,219,205	(7,689,494)	27,194,158	(10,042,874)	0
2035	16,509,444	38,772,649	144,634,838	(7,487,998)	26,134,626	(10,315,411)	3,918,981
TOTAL	597,673,152	1,366,375,525	4,989,072,424	(250,680,678)	878,106,817	(326,284,982)	39,377,413

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

(d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through
Variable OMP&R Component of Transportation Charge^a**

(in dollars)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 26A	EBX Reach 2B	EBX Reach 3A	EBX Reach 4B	Reach 28J	Reach 29A	Reach 29G
	Devil Canyon Powerplant	Greenspot Pumping Plant	Crafton Hills Pumping Plant	Cherry Valley Pumping Plant	Lake Perris (d)	Oso Pumping Plant	Warne Powerplant
	[16]	[17]	[18]	[19]	[20]	[21]	[22]
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0
1972	(3,024)	0	0	0	0	79,315	0
1973	(461,268)	0	0	0	0	122,787	0
1974	(546,156)	0	0	0	0	157,511	0
1975	(1,095,523)	0	0	0	0	314,636	0
1976	(1,566,056)	0	0	0	0	326,967	0
1977	(1,222,866)	0	0	0	0	75,335	0
1978	(3,085,094)	0	0	0	0	89,383	0
1979	(3,466,481)	0	0	0	0	102,584	0
1980	(3,318,152)	0	0	0	0	236,768	0
1981	(3,842,971)	0	0	0	0	444,280	0
1982	(2,736,072)	0	0	0	0	539,245	(783,626)
1983	(5,478,830)	0	0	0	0	214,069	(1,488,439)
1984	(7,350,989)	0	0	0	0	484,239	(4,088,209)
1985	(10,748,103)	0	0	0	0	874,069	(5,930,176)
1986	(11,484,996)	0	0	0	0	1,269,590	(5,579,301)
1987	(10,814,483)	0	0	0	53,242	1,323,472	(6,292,822)
1988	(14,495,967)	0	0	0	0	1,421,372	(6,994,588)
1989	(18,688,631)	0	0	0	0	2,046,005	(8,368,716)
1990	(20,911,839)	0	0	0	147,163	2,857,442	(11,011,193)
1991	(4,884,013)	0	0	0	0	535,456	(3,604,791)
1992	(9,513,281)	0	0	0	(61,233)	686,984	(5,272,726)
1993	(7,502,549)	0	0	0	0	51,327	(3,380,473)
1994	(11,815,745)	0	0	0	80,824	1,210,469	(5,835,219)
1995	(9,742,248)	0	0	0	0	151,109	(1,179,155)
1996	(12,358,465)	0	0	0	0	895,929	(4,248,531)
1997	(13,293,791)	0	0	0	111,776	897,657	(4,797,589)
1998	(10,108,555)	0	0	0	0	(27,767)	(746,113)
1999	(14,952,833)	0	0	0	(44,587)	655,690	(5,341,364)
2000	(25,522,757)	0	0	0	(151,630)	1,060,131	(9,464,490)
2001	(19,510,278)	0	0	0	0	6,092,112	(7,614,510)
2002	(24,676,763)	0	0	0	0	3,806,290	(10,286,903)
2003	(27,490,216)	0	0	0	1,149,239	4,336,722	(9,859,070)
2004	(31,246,167)	78,351	68,735	7,271	0	5,393,913	(11,835,098)
2005	(28,682,474)	69,752	49,118	2,575	5,148,363	3,422,861	(6,683,632)
2006	(34,389,659)	139,546	152,891	18,776	0	2,625,815	(6,870,988)
2007	(28,529,045)	270,207	265,691	14,450	591,339	6,271,106	(9,522,236)
2008	(16,403,544)	272,321	348,145	10,887	0	4,631,381	(7,184,125)
2009	(13,474,182)	342,654	360,251	9,523	389,217	3,936,073	(6,578,745)
2010	(24,427,811)	329,029	433,690	22,413	0	3,255,263	(5,697,650)
2011	(31,980,782)	390,177	505,918	36,226	0	3,278,354	(5,505,320)
2012	(24,180,386)	478,775	597,209	116,495	0	5,310,942	(6,626,651)
2013	(23,667,853)	296,767	370,362	0	12,268	6,012,976	(6,663,445)
2014	(23,938,760)	356,960	445,483	91,801	15,864	6,613,606	(6,739,259)
2015	(23,015,889)	354,387	442,272	0	0	4,420,628	(5,814,683)
2016	(24,338,466)	378,909	472,875	0	196,376	5,099,396	(6,703,574)
2017	(23,489,910)	359,924	449,182	0	0	5,165,861	(6,717,068)
2018	(23,885,234)	359,924	449,182	0	3,592,503	6,480,189	(8,299,541)
2019	(23,384,400)	359,924	449,182	0	0	6,415,701	(8,162,972)
2020	(23,798,797)	359,924	449,182	0	3,000,660	6,982,694	(8,932,211)
2021	(23,692,932)	359,924	449,182	0	66,457	6,377,484	(8,163,507)
2022	(23,527,637)	359,924	449,182	0	0	7,165,120	(9,113,797)
2023	(23,835,707)	359,924	449,182	0	1,497,510	6,850,555	(8,749,952)
2024	(24,152,712)	359,924	449,182	0	0	6,755,846	(8,607,656)
2025	(23,900,278)	359,924	449,182	0	0	6,941,667	(8,877,223)
2026	(23,593,109)	359,924	449,182	0	613,664	6,069,063	(7,759,227)
2027	(23,913,914)	359,924	449,182	0	0	7,127,474	(9,074,921)
2028	(24,145,909)	359,924	449,182	0	938,224	7,067,777	(9,030,292)
2029	(23,741,152)	359,924	449,182	0	0	6,796,331	(8,705,966)
2030	(23,447,583)	359,924	449,182	0	0	6,697,134	(8,571,386)
2031	(24,094,957)	359,924	449,182	0	369,656	6,829,702	(8,795,738)
2032	(23,198,399)	359,924	449,182	0	0	6,528,758	(8,317,095)
2033	(23,968,235)	359,924	449,182	0	4,320,852	6,725,130	(8,593,078)
2034	(23,206,701)	359,924	449,182	0	0	5,338,344	(6,897,311)
2035	(22,850,826)	359,924	449,182	0	5,986,578	5,785,221	(7,445,792)
TOTAL	(1,090,792,405)	10,596,391	13,047,098	330,417	28,024,325	217,703,543	(373,448,143)

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge^a

(in dollars)

Sheet 4 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 29H	Reach 29J	Reach 30	Reach 31A	Reach 33A	Total	
	Pyramid Lake (d)	Castaic Powerplant	Castaic Lake (d)	Las Perillas & Badger Hill Pumping Plants	Devil's Den, Bluestone & Polonio Pumping Plants		
[23]	[24]	[25]	[26]	[27]	[28]	[29]	
1962	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	13,881	236,998
1968	0	0	0	118,676	0	774,253	1,117,913
1969	0	0	0	78,350	0	507,516	773,646
1970	0	0	0	136,429	0	693,842	1,103,798
1971	0	0	0	166,296	0	1,083,864	1,476,135
1972	0	(211,144)	0	237,638	0	2,494,486	3,107,622
1973	0	(1,057,564)	0	120,913	0	2,432,136	2,940,075
1974	0	(1,547,884)	0	118,582	0	3,107,972	3,691,020
1975	0	(2,455,461)	0	94,848	0	5,460,134	5,824,671
1976	0	(2,827,557)	0	141,260	0	7,621,469	8,213,686
1977	0	(3,734,462)	0	71,311	0	390,887	926,518
1978	0	(1,542,479)	0	179,925	0	6,714,161	7,322,208
1979	0	(2,773,323)	0	192,126	0	8,984,155	9,605,528
1980	0	(3,408,863)	0	168,458	0	9,882,560	10,425,874
1981	0	(2,834,322)	0	169,177	0	16,972,365	17,563,899
1982	0	(3,463,971)	0	168,390	0	12,859,335	13,477,272
1983	0	(6,649,626)	0	17,920	0	(7,537,336)	(7,452,772)
1984	0	(4,710,802)	0	112,679	0	(4,435,856)	(4,159,491)
1985	0	(15,698,638)	0	146,843	0	(10,322,390)	(9,861,182)
1986	0	(11,072,448)	0	297,886	0	10,793,124	11,622,736
1987	80,822	(11,557,616)	(43,085)	245,082	0	5,785,662	6,701,443
1988	54,038	(12,295,001)	(210,845)	214,519	0	5,286,195	6,239,204
1989	84,370	(14,812,039)	89,852	282,180	0	23,321,280	24,585,083
1990	0	(20,116,741)	245,034	416,832	0	46,159,453	48,154,173
1991	432,382	(6,579,194)	0	3,610	0	2,015,736	2,462,223
1992	29,879	(9,167,653)	(1,141,229)	101,665	0	(5,884,782)	(5,509,966)
1993	(675,438)	(7,895,978)	(2,751,590)	(111,306)	0	(24,731,032)	(24,907,974)
1994	0	(10,565,940)	(81,262)	206,086	(1,127)	12,582,103	13,499,081
1995	544,099	(4,049,615)	0	243,434	0	(497,942)	(142,959)
1996	0	(8,457,232)	0	296,170	0	15,023,644	15,870,542
1997	0	(8,727,328)	(897)	298,483	208,816	13,156,006	14,336,880
1998	(965,988)	(3,360,851)	(2,139,549)	(55,491)	(92,902)	(24,248,768)	(24,405,949)
1999	0	(9,672,802)	0	160,203	228,670	(4,317,146)	(3,840,250)
2000	0	(17,958,033)	0	201,455	332,070	(14,661,171)	(13,765,939)
2001	991,221	(13,495,346)	2,388,654	1,073,833	2,146,216	203,636,797	208,485,964
2002	0	(18,455,025)	0	544,053	1,351,161	86,145,819	88,826,761
2003	833,085	(16,903,355)	963,510	636,846	1,524,988	126,418,082	129,380,654
2004	221,340	(21,110,644)	682,258	670,805	1,774,635	140,491,175	143,533,689
2005	4,754,964	(12,763,664)	4,547,598	843,113	1,708,384	162,771,761	166,176,372
2006	532,724	(11,822,176)	6,133,088	820,913	1,380,105	129,094,376	132,260,895
2007	0	(19,017,327)	0	1,285,764	2,280,183	196,714,601	201,828,537
2008	0	(14,961,833)	1,330,388	1,069,245	1,648,541	125,303,583	129,358,268
2009	391,468	(16,146,570)	0	745,001	1,292,725	85,075,763	88,260,569
2010	0	(10,738,810)	0	943,033	1,630,014	140,303,010	143,404,352
2011	0	(11,102,175)	2,042,684	1,255,736	2,659,904	203,375,181	207,930,870
2012	0	(10,733,415)	0	1,504,664	5,315,616	231,314,271	240,301,332
2013	0	(10,701,747)	0	1,401,219	3,406,327	267,695,209	275,052,370
2014	0	(10,751,535)	0	1,513,417	3,690,031	294,747,241	302,884,524
2015	0	(8,686,089)	0	1,349,904	3,022,262	217,293,145	223,190,016
2016	0	(10,215,840)	1,070,881	1,349,904	3,022,262	235,587,561	241,607,848
2017	0	(10,350,954)	0	1,349,904	3,022,262	226,178,174	232,322,496
2018	0	(13,083,211)	4,969,347	1,474,910	3,866,764	270,714,447	277,170,011
2019	0	(12,925,677)	0	1,474,910	3,866,764	244,320,639	250,777,156
2020	0	(14,089,648)	0	1,474,910	3,866,764	259,567,367	266,023,884
2021	0	(12,844,786)	0	1,474,910	3,866,764	251,547,757	258,004,274
2022	0	(14,470,051)	7,564	1,474,910	3,866,764	260,588,447	267,044,964
2023	0	(13,817,610)	52,816	1,474,910	3,866,764	265,461,629	271,918,146
2024	0	(13,637,138)	1,500,793	1,474,910	3,866,764	252,260,403	258,716,920
2025	0	(14,001,067)	139,688	1,474,910	3,866,764	262,598,773	269,055,290
2026	0	(12,213,631)	0	1,474,910	3,866,764	243,127,665	249,584,182
2027	0	(14,400,072)	1,803,055	1,474,910	3,866,764	261,880,836	268,337,353
2028	0	(14,262,387)	0	1,474,910	3,866,764	262,062,403	268,518,920
2029	0	(13,713,368)	1,245,107	1,474,910	3,866,764	257,766,179	264,222,696
2030	0	(13,500,409)	0	1,474,910	3,866,764	252,197,718	258,654,235
2031	0	(13,837,816)	10,748,792	1,474,910	3,866,764	276,114,581	282,571,098
2032	0	(13,144,233)	0	1,474,910	3,866,764	244,739,971	251,196,488
2033	0	(13,616,770)	9,145,318	1,474,910	3,866,764	273,335,064	279,791,581
2034	0	(10,703,920)	0	1,474,910	3,866,764	236,918,863	243,375,380
2035	0	(11,876,686)	29,159,531	1,474,910	3,866,764	274,431,262	280,887,779
TOTAL	7,308,966	(677,299,552)	71,897,502	50,146,363	111,152,895	7,839,259,549	8,058,391,649

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

TABLE B-13 Capital and Operating Costs of Project Conservation Facilities to be Reimbursed through Delta Water Charge

(in dollars)

Calendar Year	Initial Project Conservation Facilities (Portions of Upper Feather Lakes, Oroville-Thermalito and California Aqueduct Facilities)					Planning and Pre-operating Costs (a,f)	Total
	Capital Costs (a)	Capital Cost Credits (b)	Operating Costs (c)	Application of Oroville Power Revenues to:			
				Capital Costs (d)	Operating Costs (e)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	
1952	171,322	0	0	0	0	0	171,322
1953	312,190	0	0	0	0	0	312,190
1954	308,624	0	0	0	0	0	308,624
1955	194,645	0	0	0	0	0	194,645
1956	1,357,077	0	0	0	0	0	1,357,077
1957	6,210,709	0	0	0	0	0	6,210,709
1958	9,510,916	0	0	0	0	0	9,510,916
1959	11,390,586	0	0	0	0	0	11,390,586
1960	14,463,274	(4,850,000)	0	0	0	0	9,613,274
1961	18,729,965	(431,527)	0	0	0	0	18,298,438
1962	9,098,967	(479,260)	0	0	0	0	8,620,687
1963	73,098,107	(478,743)	(14,000)	0	0	0	72,605,364
1964	62,629,003	(751,330)	(14,000)	0	0	107,780	61,971,453
1965	71,048,877	(763,541)	(14,000)	0	0	551,850	70,823,186
1966	125,376,541	(748,649)	(14,000)	0	0	1,081,023	125,694,915
1967	94,481,603	(812,145)	(13,446)	0	0	1,189,212	94,845,224
1968	39,986,145	(431,574)	1,303,821	(951,000)	0	793,399	40,700,791
1969	5,367,865	(259,015)	2,890,772	(11,007,000)	0	601,867	(2,405,511)
1970	4,208,411	(203,733)	4,816,634	(14,650,000)	(1,500,000)	516,659	(6,810,029)
1971	3,956,703	(193,631)	6,026,480	(14,650,000)	(1,500,000)	408,754	(5,951,694)
1972	4,662,254	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,003,722)
1973	4,090,078	(136,937)	6,135,774	(14,650,000)	(1,500,000)	203,384	(5,857,761)
1974	6,852,718	(137,503)	6,944,723	(17,950,000)	(1,500,000)	201,907	(5,588,155)
1975	8,343,833	(234,567)	7,697,390	(14,650,000)	(1,500,000)	146,188	(197,156)
1976	6,189,617	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(2,893,056)
1977	21,554,452	(150,214)	10,547,977	(14,650,000)	(1,500,000)	857,419	16,659,634
1978	8,031,393	(64,566)	12,851,158	(14,650,000)	(1,500,000)	2,131,286	6,799,271
1979	9,751,861	0	9,547,014	(14,650,000)	(1,500,000)	2,131,884	5,280,759
1980	11,345,574	0	13,258,298	(14,650,000)	(1,500,000)	3,638,851	12,092,723
1981	11,921,267	0	10,326,538	(14,650,000)	(1,500,000)	4,597,474	10,695,279
1982	17,479,060	0	16,154,872	(14,650,000)	(1,500,000)	4,594,682	22,078,614
1983	12,763,378	0	22,251,331	(34,705,000)	(8,735,000)	3,751,983	(4,673,298)
1984	9,367,268	0	22,700,224	(14,650,000)	(10,348,000)	2,979,126	10,048,618
1985	12,538,173	0	23,462,283	(14,650,000)	(8,198,000)	2,069,024	15,221,480
1986	21,586,489	0	26,479,379	(14,650,000)	(9,107,000)	1,602,419	25,911,287
1987	32,734,633	0	23,473,639	(14,650,000)	(9,451,000)	1,762,179	33,875,651
1988	33,028,679	0	25,832,491	(14,650,000)	(8,677,000)	1,808,899	37,343,069
1989	11,075,132	0	28,442,946	(14,650,000)	(8,102,000)	2,678,007	19,444,085
1990	28,764,328	0	37,430,776	(14,650,000)	(8,498,000)	1,436,712	44,483,816
1991	37,462,303	0	76,586,450	(14,650,000)	(9,487,000)	1,727,664	91,639,417
1992	29,169,134	0	32,280,228	(14,650,000)	(8,526,000)	1,707,822	39,981,184
1993	22,366,872	0	36,884,103	(14,650,000)	(8,768,000)	1,708,490	37,541,465
1994	14,709,626	0	41,193,693	(14,650,000)	(7,484,000)	2,134,392	35,903,711
1995	15,120,857	0	46,162,374	(14,650,000)	(4,976,939)	2,042,481	43,698,773
1996	10,993,690	0	50,885,567	(14,650,000)	(5,503,289)	2,448,692	44,174,660
1997	15,268,658	0	51,788,497	(14,650,000)	(5,740,515)	1,699,730	48,366,370
1998	3,854,825	0	54,725,293	(14,650,000)	(8,155,000)	1,193,198	36,959,316
1999	7,473,717	0	56,455,442	(14,650,000)	(9,198,000)	9,686	40,090,845
2000	10,100,362	0	56,732,382	(14,688,338)	(10,297,482)	13,491	41,860,415
2001	10,291,275	0	76,142,398	(16,223,803)	(14,328,482)	23,866	55,905,254
2002	19,500,854	0	68,348,633	(19,498,891)	(20,826,560)	24,426	47,548,462
2003	22,830,468	0	78,570,188	(20,605,664)	(29,982,088)	9,833	50,822,737
2004	20,900,202	0	92,045,630	(17,530,688)	(35,845,422)	7,548	59,577,270
2005	5,906,589	0	104,136,411	(15,354,462)	(22,004,805)	0	72,683,733
2006	10,785,355	0	102,092,650	(15,210,585)	(21,005,765)	0	76,661,655
2007	7,627,412	0	87,457,173	(14,734,855)	(16,759,447)	215,235	63,805,518
2008	5,927,892	0	103,592,165	(14,665,045)	(19,295,181)	594,918	76,154,749
2009	5,046,897	0	117,154,917	(15,908,666)	(20,877,805)	606,860	86,022,203
2010	4,283,160	0	120,367,604	(15,953,842)	(20,222,025)	553,843	89,028,740
2011	8,320,870	0	127,011,929	(15,953,762)	(19,207,013)	394,796	100,566,820
2012	33,704,908	0	132,880,295	(18,019,651)	(20,476,196)	100,000	130,189,356
2013	28,101,674	0	151,305,518	(16,019,832)	(20,988,101)	25,000	142,424,260
2014	16,156,250	0	132,037,108	(16,019,674)	(21,512,803)	25,000	110,685,881
2015	18,054,810	0	133,315,053	(16,020,170)	(21,202,290)	0	114,147,403
2016	8,830,046	0	132,100,109	(16,019,736)	(21,414,313)	0	103,496,106
2017	8,034,062	0	131,921,144	(16,020,001)	(21,628,456)	0	102,306,749
2018	8,034,062	0	133,380,776	(16,019,864)	(21,844,741)	0	103,550,233
2019	1,272,062	0	132,464,777	(16,019,710)	(22,063,188)	0	95,653,941
2020	1,272,062	0	133,875,814	(16,019,806)	(22,263,820)	0	96,844,250
2021	1,272,062	0	131,068,368	(16,020,117)	(22,506,658)	0	93,813,655
2022	400,947	0	132,106,940	(16,019,881)	(22,731,725)	0	93,756,281
2023	400,947	0	132,355,611	(16,019,642)	(22,959,042)	0	93,777,874
2024	400,947	0	134,072,784	(16,019,895)	(23,188,633)	0	95,265,203
2025	400,947	0	134,406,544	(16,019,441)	(23,420,519)	0	95,367,531
2026	400,947	0	136,082,774	(16,019,845)	(23,654,724)	0	96,809,152
2027	400,947	0	137,654,113	(16,019,672)	(23,891,271)	0	98,144,117
2028	400,947	0	138,440,454	(16,019,453)	(24,130,184)	0	98,691,764
2029	400,947	0	140,048,239	(16,019,674)	(24,371,486)	0	100,058,026
2030	400,947	0	141,428,249	(14,715,595)	(24,615,201)	0	102,498,400
2031	400,947	0	142,810,963	(14,715,815)	(24,861,353)	0	103,634,742
2032	400,947	0	144,046,286	(14,715,725)	(25,109,966)	0	104,621,542
2033	400,947	0	144,177,476	(14,715,715)	(25,361,066)	0	104,501,642
2034	400,947	0	146,384,342	(14,715,881)	(25,614,677)	0	106,454,731
2035	400,947	0	146,926,873	(14,715,668)	(25,870,823)	0	106,741,329
TOTAL	1,242,268,991	(11,528,320)	5,206,878,659	(1,047,792,062)	(964,808,054)	59,601,557	4,484,620,772

- (a) Reimbursed through the capital cost component of the Delta Water Charge.
- (b) Negotiated settlements as to the magnitude of SWP planning costs from 1952 through 1978.
- (c) Reimbursed through the minimum OMP&R component of the Delta Water Charge. Credits for Gianelli power generation are reflected in these net costs.
- (d) Revenues credited through the capital cost component of the Delta Water Charge.
- (e) Revenues credited through the minimum OMP&R component of the Delta Water Charge.
- (f) Under amendments of Articles 22(e) and 22(g), planning and pre-operating costs of additional Project Conservation Facilities incurred through 2011 reflected in the Delta Water Charge.

Tables B-14 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA (a)	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	83	114	410	607	122	224	346
1953	0	0	0	323	479	1,808	2,610	336	620	956
1954	0	0	0	819	1,306	5,150	7,275	421	777	1,198
1955	0	0	0	977	1,570	6,297	8,844	211	390	601
1956	0	0	0	8,844	14,459	63,816	87,119	227	418	645
1957	15,199	11,436	26,635	21,564	35,240	649,596	706,400	291	536	827
1958	33,420	16,591	50,011	67,764	71,717	733,414	872,895	720	1,328	2,048
1959	20,697	6,591	27,288	154,255	143,730	493,050	791,035	10,636	69,139	79,775
1960	9,097	8,830	17,927	296,492	275,610	1,018,661	1,590,763	15,255	99,794	115,049
1961	6,950	7,445	14,395	853,506	802,675	1,914,709	3,570,890	10,163	36,681	46,844
1962	(194)	(926)	(1,120)	545,123	615,141	1,686,041	2,846,305	17,281	39,570	56,851
1963	1,319	1,111	2,430	657,426	1,281,271	3,243,838	5,182,535	68,821	140,841	209,662
1964	38,393	35,466	73,859	712,650	1,747,783	7,251,800	9,712,233	138,614	282,003	420,617
1965	198,833	62,221	261,054	360,779	606,025	3,414,457	4,381,261	250,706	497,152	747,858
1966	461,619	49,917	511,536	592,714	592,598	2,245,215	3,430,527	587,951	1,117,486	1,705,437
1967	1,569,498	40,379	1,609,877	796,995	803,951	2,401,862	4,002,808	936,412	1,762,694	2,699,106
1968	859,613	61,691	921,304	736,470	696,075	1,997,924	3,430,469	351,131	675,220	1,026,351
1969	74,388	59,318	133,706	269,698	293,275	764,950	1,327,923	76,966	164,583	241,549
1970	43,361	67,877	111,238	58,676	61,200	135,569	255,445	47,891	109,224	157,115
1971	26,763	34,052	60,815	12,086	18,227	84,089	114,402	28,638	80,715	109,353
1972	19,643	18,905	38,548	12,293	12,763	63,610	88,666	19,289	50,230	69,519
1973	56,510	30,874	87,384	10,494	12,136	39,380	62,010	23,010	56,178	79,188
1974	165,830	65,832	231,662	15,722	24,402	73,119	113,243	25,037	61,383	86,420
1975	91,824	89,234	181,058	16,730	15,806	41,394	73,930	14,740	61,416	76,156
1976	57,765	83,651	141,416	34,004	34,663	109,610	178,277	33,638	130,440	164,078
1977	64,167	80,147	144,314	46,229	45,115	133,375	224,719	108,324	264,720	373,044
1978	69,319	91,717	161,036	71,234	66,008	174,899	312,140	21,415	103,822	125,237
1979	191,273	282,907	474,180	45,468	42,943	110,665	199,076	22,941	125,669	148,610
1980	264,433	386,006	650,439	134,522	124,352	304,614	563,488	103,258	462,895	566,153
1981	227,606	383,086	610,692	(33,738)	(29,856)	(65,637)	(129,231)	(15,416)	(135,240)	(150,656)
1982	549,164	870,611	1,419,775	7,876	8,321	27,065	43,262	4,102	(58,882)	(54,780)
1983	1,254,900	1,433,061	2,687,961	138,413	131,515	339,246	609,174	32,196	110,287	142,483
1984	2,547,878	2,750,040	5,297,918	152,992	140,971	351,921	645,884	35,448	107,723	143,171
1985	7,143,123	6,443,613	13,586,736	19,776	19,245	53,491	92,512	17,424	78,896	96,320
1986	10,565,937	16,926,630	27,492,567	32,034	31,581	88,070	151,685	44,135	306,452	350,587
1987	7,979,832	12,599,507	20,579,339	50,153	48,675	138,959	237,787	126,995	1,342,116	1,469,111
1988	2,312,909	4,343,513	6,656,422	116,181	112,294	302,461	530,936	156,473	1,479,545	1,636,018
1989	1,224,538	1,553,352	2,777,890	108,320	102,804	260,092	471,216	152,173	1,210,940	1,363,113
1990	443,002	824,055	1,267,057	224,263	224,188	625,213	1,073,684	222,208	1,559,457	1,781,665
1991	99,848	89,269	189,117	413,426	383,368	946,246	1,743,040	298,398	2,184,088	2,482,486
1992	57,045	62,083	119,128	182,231	169,968	442,055	794,254	361,210	3,504,755	3,865,965
1993	122,423	128,634	251,057	129,344	125,312	342,416	597,072	1,170,649	11,997,953	13,168,602
1994	71,274	83,270	154,544	46,042	58,050	229,649	333,741	4,260,734	46,401,596	50,662,330
1995	30,605	29,271	59,876	97,808	97,063	257,484	452,355	12,268,787	155,255,850	167,524,637
1996	20,275	19,069	39,344	49,854	48,056	127,493	225,403	11,284,548	145,409,410	156,693,958
1997	20,039	107,784	127,823	82,598	78,996	209,517	371,111	3,184,506	38,158,718	41,343,224
1998	17,423	21,572	38,995	27,302	24,121	63,057	114,480	883,110	10,563,359	11,446,469
1999	67,602	106,355	173,957	74,165	73,552	208,296	356,013	928,738	9,596,058	10,524,796
2000	16,252	37,932	54,184	27,445	28,844	80,346	136,635	488,160	5,529,102	6,017,262
2001	6,598	13,750	20,348	140,394	270,055	1,856,845	2,267,294	72,358	539,206	611,564
2002	19,917	45,940	65,857	805,478	1,189,615	5,876,842	7,871,935	63,183	376,338	439,521
2003	54,235	20,712	74,947	1,156,874	1,331,274	4,619,175	7,107,323	(2,558)	77,220	74,662
2004	153,240	20,534	173,774	360,395	346,064	4,106,508	4,812,967	8,906	46,169	55,075
2005	60,543	62,997	123,540	358,153	339,995	1,541,971	2,240,119	(10,551)	(177,303)	(187,854)
2006	887,961	20,258	908,219	711,377	660,630	1,589,731	2,961,738	5,984	60,533	66,517
2007	3,237,280	43,244	3,280,524	715,234	661,058	1,586,475	2,962,767	14,376	80,691	95,067
2008	7,903,072	61,968	7,965,040	1,314,460	1,213,310	2,904,291	5,432,061	20,582	84,897	105,479
2009	1,197,373	20,419	1,217,792	2,754,599	2,576,522	6,144,919	11,476,040	8,093	73,241	81,334
2010	397,066	4,083	401,149	3,666,012	3,334,569	8,364,010	15,364,591	75,323	140,003	215,326
2011	155,151	16,415	171,566	3,813,699	3,615,739	8,715,989	16,145,427	97,865	185,273	283,138
2012	112,446	153,902	266,348	1,848,534	1,983,016	5,053,111	8,884,661	679,404	3,993,276	4,672,680
2013	294,381	274,724	569,105	260,855	283,863	772,500	1,317,218	276,565	1,788,248	2,064,813
2014	1,822,215	3,824,930	5,647,145	137,332	160,209	455,760	753,301	110,382	1,417,078	1,527,460
2015	158,800	146,345	305,145	70,022	87,527	260,337	417,886	35,540	1,185,996	1,221,536
2016	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2017	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2018	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2019	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2020	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2021	16,678	18,467	35,145	5,601	7,357	26,868	39,826	2,711	1,036,082	1,038,793
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	55,671,741	55,235,002	110,906,743	26,627,469	28,415,290	88,200,433	143,243,192	40,290,741	457,085,689	497,376,430

Note: Allocated capital costs as a result of permanent water transfers under Monterey are not reflected on this Table.

(a) Costs from Table B-10 allocated to Solano County Water Agency are reduced herein by \$2,102,700 in 1986 and \$1,823,500 in 1987 under provisions of Amendment No. 10 to its water supply contract.

TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District (b)	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (c)	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
1952	389	20	58	938	119	9,129	20	12	785	11,470
1953	1,076	53	161	2,887	345	27,383	55	33	2,157	34,150
1954	1,350	68	201	3,373	417	32,369	69	43	2,718	40,608
1955	677	34	101	1,497	197	14,721	35	23	1,371	18,656
1956	726	34	108	2,702	273	24,255	35	25	1,416	29,574
1957	932	38	139	6,048	494	49,932	39	29	1,707	59,358
1958	2,308	102	344	14,374	1,153	119,049	104	61	4,368	141,863
1959	7,384	364	2,517	26,218	2,597	253,891	372	361	14,757	308,481
1960	12,940	630	3,666	34,054	4,155	352,166	644	498	25,696	434,449
1961	21,848	1,063	3,954	51,407	6,500	538,707	1,087	598	43,377	668,541
1962	49,320	2,410	7,867	94,933	13,834	1,017,146	2,465	1,879	98,141	1,287,995
1963	208,757	10,687	32,172	364,014	55,715	3,934,636	10,932	5,990	425,330	5,048,233
1964	328,286	16,961	64,890	600,152	88,904	6,636,279	17,350	11,942	672,013	8,436,777
1965	538,215	27,481	117,996	1,098,999	152,930	11,999,892	28,116	21,802	1,095,126	15,080,557
1966	1,107,757	52,586	279,172	2,218,832	339,222	24,857,487	53,789	38,891	2,173,090	31,120,826
1967	852,537	39,537	445,562	2,012,744	286,990	23,629,026	40,444	34,775	1,653,429	28,995,044
1968	198,739	9,739	166,267	1,104,132	70,086	11,544,942	9,962	12,238	396,075	13,512,180
1969	94,436	4,793	35,473	616,516	27,216	6,416,147	4,903	7,302	191,574	7,398,360
1970	54,344	2,720	21,686	414,659	15,520	4,475,046	2,782	3,999	109,470	4,770,226
1971	25,462	1,291	12,094	190,552	7,114	1,622,274	1,320	540	51,618	1,912,265
1972	11,589	589	8,354	82,886	3,409	723,623	602	343	23,526	854,921
1973	6,657	335	10,201	39,973	1,980	458,527	343	221	13,448	531,685
1974	9,478	469	11,044	45,420	2,766	483,866	479	326	18,979	572,827
1975	13,329	677	5,246	36,467	3,710	382,743	692	425	27,048	470,337
1976	17,506	837	12,615	53,085	5,621	654,026	856	1,152	34,455	780,153
1977	9,672	436	47,790	36,478	3,753	886,672	446	494	18,497	1,004,238
1978	23,499	(30,406)	6,178	54,219	6,579	575,169	1,209	1,402	47,446	685,295
1979	25,051	1,295	5,664	53,866	6,610	559,746	1,325	1,862	51,293	706,712
1980	144,980	(4,617)	31,160	321,890	38,126	3,211,810	7,682	7,144	297,215	4,055,390
1981	(5,427)	(15,464)	200	(44,773)	(1,223)	(385,275)	(296)	1,752	(11,324)	(461,830)
1982	49,916	2,584	6,600	83,283	13,142	654,692	2,638	1,252	102,287	916,394
1983	52,429	(35,295)	12,125	110,465	13,872	1,073,500	2,769	1,327	107,337	1,338,529
1984	86,345	4,474	14,303	154,799	22,764	1,617,225	4,572	2,678	177,020	2,084,180
1985	25,435	1,311	5,649	47,055	6,766	484,485	1,341	1,176	52,013	625,231
1986	38,309	(41,067)	9,862	71,661	10,320	796,097	2,009	778	78,142	966,111
1987	28,769	1,476	7,004	55,537	7,969	616,845	1,509	1,491	58,679	779,279
1988	52,329	2,831	17,078	70,572	12,049	909,046	2,894	4,620	109,713	1,181,132
1989	156,099	8,019	27,551	352,103	42,943	3,834,481	8,201	12,134	318,604	4,760,135
1990	292,361	15,142	50,360	553,394	87,199	6,094,021	15,487	22,729	599,233	7,729,926
1991	349,413	18,103	60,419	580,572	91,765	6,447,565	18,515	23,486	716,292	8,306,130
1992	125,891	6,439	28,019	241,559	34,559	2,711,639	6,585	10,883	256,370	3,421,944
1993	86,113	4,375	30,245	174,630	23,840	2,059,168	4,474	4,698	174,772	2,562,315
1994	64,762	3,323	23,894	124,518	17,633	1,488,418	3,398	2,173	132,095	1,860,214
1995	82,969	(1,000)	72,734	167,698	24,390	2,472,332	4,355	2,824	169,318	2,995,620
1996	27,611	(61,913)	51,990	68,870	8,812	1,233,548	1,437	1,590	56,092	1,388,037
1997	136,503	7,041	48,721	241,400	36,417	2,951,687	7,195	3,706	279,205	3,711,875
1998	70,737	(121,004)	23,083	122,934	18,622	1,474,568	3,742	1,278	144,963	1,738,923
1999	81,197	4,192	26,645	142,983	21,661	1,715,933	4,285	3,846	166,160	2,166,902
2000	21,089	1,073	9,822	45,704	6,013	547,927	1,096	(1,081)	42,826	674,469
2001	17,776	907	7,862	36,078	5,062	432,671	927	781	36,153	538,217
2002	74,205	3,811	16,014	132,974	20,050	1,498,693	3,898	727	151,445	1,901,817
2003	(51,174)	(2,675)	(5,510)	(76,110)	(13,086)	(822,789)	(2,736)	337	(105,392)	(1,079,135)
2004	7,704	394	2,497	17,036	2,079	183,122	404	1,518	15,697	230,451
2005	28,573	1,473	5,736	52,697	7,564	539,512	1,505	561	58,418	696,039
2006	2,796	142	775	17,482	758	58,084	146	553	5,681	86,417
2007	9,213	458	3,265	26,805	2,610	217,561	468	601	18,485	279,466
2008	37,255	1,922	7,631	63,716	9,847	705,323	1,964	1,353	76,209	905,220
2009	12,954	657	2,914	45,028	3,535	266,406	672	785	26,274	359,225
2010	25,920	1,344	35,841	65,589	6,780	825,513	1,375	178	53,163	1,015,703
2011	26,317	1,365	46,735	53,156	6,884	956,210	1,396	454	53,976	1,146,493
2012	100,257	5,153	219,844	180,035	26,730	4,279,329	5,269	4,247	204,686	5,025,550
2013	396,173	20,477	114,886	665,258	104,337	7,887,795	20,938	19,647	811,173	10,040,684
2014	163,607	8,402	39,830	284,511	43,652	3,261,412	8,594	7,096	333,881	4,150,985
2015	20,347	1,002	10,364	44,115	5,893	539,709	1,025	814	40,644	663,913
2016	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2017	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2018	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2019	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2020	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2021	4,333	214	729	10,211	1,281	104,321	219	172	8,668	130,148
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	6,490,015	(9,018)	2,372,042	14,617,915	1,886,229	165,413,038	331,522	298,454	13,058,423	204,458,620

(b) Costs from Table B-10 allocated to Empire West Side Irrigation District are reduced herein by \$31,588 in 1978; \$12,129 in 1980; \$15,173 in 1981; \$38,004 in 1983; \$43,033 in 1986; \$5,261 in 1995; \$63,318 in 1996 and \$124,667 in 1998 in accordance with letters of agreement with the district.

(c) Costs related to maximum annual Table A of 15,000 acre-feet under Amendment No. 18 of the water supply contract with Kern County Water Agency.

TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (d)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1952	3,158	1,042	850	254	1,402	70	1,695	418	6,079	1,550
1953	10,026	3,327	2,668	799	4,401	222	5,318	1,328	19,058	4,852
1954	12,742	4,193	3,465	1,031	5,714	285	6,908	1,691	24,608	6,290
1955	5,411	1,881	1,374	401	2,267	115	2,756	715	9,229	2,377
1956	9,775	3,590	2,196	612	3,622	191	4,449	1,267	13,138	3,438
1957	26,306	9,255	6,343	1,816	10,461	540	12,767	3,450	40,646	10,534
1958	49,204	17,599	11,581	3,290	19,099	991	23,360	6,414	72,708	18,898
1959	70,247	29,740	15,869	4,616	26,171	1,347	31,759	9,030	98,596	25,519
1960	84,552	38,760	22,068	6,797	36,395	1,547	43,260	10,772	147,170	37,469
1961	126,542	54,262	34,613	12,530	57,086	2,245	63,709	16,437	236,164	57,707
1962	198,558	85,352	43,719	13,861	72,102	3,344	84,709	24,943	253,435	64,330
1963	580,138	255,252	116,797	33,149	192,624	9,828	234,926	73,256	610,277	160,624
1964	1,094,365	501,858	209,462	55,445	345,446	18,442	429,605	137,769	1,026,066	276,118
1965	1,908,076	947,523	385,533	103,757	635,825	32,819	786,986	244,587	1,913,090	512,862
1966	3,960,302	2,150,972	812,655	215,858	1,340,235	69,325	1,664,584	517,269	3,943,586	1,062,417
1967	4,976,538	4,100,531	1,077,422	296,069	1,776,892	88,301	2,182,240	653,250	5,821,681	1,550,239
1968	5,924,474	3,998,942	1,350,742	368,156	2,227,646	107,350	2,738,009	783,940	7,982,824	2,122,940
1969	5,822,708	3,079,426	1,690,259	539,851	2,787,631	121,303	3,256,507	865,455	10,881,855	2,769,647
1970	5,032,959	3,277,778	2,050,788	695,345	3,382,251	106,381	3,872,367	736,775	13,795,809	3,457,109
1971	2,577,507	2,146,954	1,071,523	338,581	1,767,179	48,337	2,087,223	347,057	8,137,053	1,987,120
1972	973,436	283,257	331,759	92,079	547,138	19,134	668,550	134,360	2,691,137	697,957
1973	354,407	914,303	158,579	82,223	261,557	6,304	238,094	46,102	1,760,570	403,582
1974	451,450	280,861	259,175	74,113	427,433	8,143	518,453	59,145	1,617,394	425,927
1975	253,438	246,492	193,632	52,821	319,337	4,954	392,110	33,995	1,533,664	407,913
1976	237,539	255,238	136,751	37,235	225,529	4,245	277,807	31,002	962,280	255,901
1977	199,554	371,469	91,384	25,858	150,711	3,757	183,609	26,834	591,445	155,537
1978	302,111	470,176	78,573	22,226	129,594	5,233	157,815	38,654	428,989	111,769
1979	357,678	938,985	81,807	21,795	134,915	5,965	166,931	44,410	403,569	108,408
1980	1,867,517	1,777,294	423,755	113,166	698,855	32,435	864,104	240,899	2,040,757	548,085
1981	(158,728)	610,795	(47,102)	(8,865)	(77,678)	(2,576)	(102,568)	(19,588)	(143,875)	(43,557)
1982	1,557,934	861,928	298,770	78,903	492,728	26,237	613,587	196,672	1,421,407	388,261
1983	2,062,512	521,349	396,033	115,678	653,134	34,699	803,945	259,939	2,126,313	581,672
1984	1,518,361	295,783	297,559	85,097	490,731	27,272	606,124	188,562	1,546,628	423,408
1985	896,226	158,810	217,115	62,532	358,064	13,104	441,299	107,533	1,116,949	305,291
1986	841,555	104,860	221,194	58,152	364,790	9,038	454,702	93,309	1,048,625	286,302
1987	333,052	105,625	166,099	43,992	273,928	5,566	340,485	40,716	783,725	213,202
1988	259,234	174,155	65,831	22,723	108,570	3,384	128,339	26,743	429,498	113,644
1989	1,045,999	434,394	323,138	97,036	532,920	16,777	649,616	125,344	1,375,722	372,048
1990	678,053	374,313	332,566	97,789	548,468	7,335	672,344	67,179	1,509,745	409,710
1991	831,687	401,961	367,196	120,925	605,579	11,966	733,443	92,625	1,979,364	540,210
1992	633,272	356,952	270,826	131,328	446,647	9,556	501,634	76,760	2,093,387	573,386
1993	634,283	332,089	222,347	171,095	366,700	10,194	353,470	73,955	3,848,084	1,046,752
1994	467,409	165,607	132,599	93,839	218,685	7,255	218,494	53,209	2,347,599	637,733
1995	459,990	293,308	132,690	78,390	218,835	7,436	232,377	54,544	1,960,099	530,656
1996	299,764	206,742	110,520	44,965	182,270	4,885	211,872	35,808	4,024,655	972,829
1997	438,898	249,699	103,382	24,640	170,497	7,397	214,534	54,452	2,892,626	397,103
1998	234,379	202,650	62,492	41,136	103,063	3,989	106,009	29,551	3,683,353	303,255
1999	268,224	175,939	89,312	40,069	147,294	4,812	167,592	35,399	5,733,586	235,054
2000	139,035	77,889	54,795	23,903	90,369	2,665	103,194	19,150	14,346,200	171,107
2001	130,754	44,790	50,816	15,641	83,805	2,989	102,254	20,949	20,292,397	96,254
2002	167,056	107,515	34,405	11,395	56,741	2,453	68,208	18,551	9,841,901	126,427
2003	(45,645)	(11,439)	2,965	2,129	4,890	(800)	4,231	(5,944)	3,944,813	27,247
2004	63,046	38,831	20,124	5,569	33,188	1,133	41,043	8,244	2,148,313	38,381
2005	185,058	105,447	38,609	11,966	63,674	3,200	76,154	23,692	990,923	61,078
2006	320,892	240,802	65,892	24,565	108,672	5,420	121,887	40,415	2,027,154	110,707
2007	248,491	177,829	55,899	21,595	92,189	4,393	107,875	32,061	2,126,689	106,321
2008	115,672	156,501	63,067	58,916	104,025	2,066	66,877	15,021	3,335,814	254,281
2009	574,764	338,277	153,096	60,222	252,497	9,781	274,446	72,787	4,777,843	270,948
2010	642,753	339,864	193,366	62,727	318,906	10,775	370,288	80,800	5,459,304	285,354
2011	312,914	204,142	225,295	58,001	371,553	5,256	463,435	39,373	6,221,250	280,991
2012	356,436	530,902	305,467	97,671	503,776	6,462	606,345	46,710	2,089,218	496,646
2013	978,217	534,682	209,790	62,114	345,987	17,346	427,422	126,525	1,326,153	362,590
2014	445,183	234,016	159,497	41,168	263,041	8,417	329,719	59,541	1,272,228	345,329
2015	125,497	54,518	90,228	23,287	148,804	2,632	186,093	17,811	601,646	163,619
2016	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2017	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2018	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2019	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2020	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2021	41,524	14,281	8,473	2,200	13,973	734	17,431	5,476	40,202	10,855
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	55,782,089	35,533,523	16,202,058	5,207,227	26,720,688	1,000,071	31,801,965	7,332,478	187,899,756	28,796,488

(d) Costs from Table B-10 allocated to Castaic Lake Water Agency are reduced herein by \$14,088 in 1978 in accordance with a letter of agreement with the district.

TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California (e)	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1952	962	69,020	370	86,870	0	0	0	0	59	99,352
1953	3,011	217,634	1,187	273,831	0	0	0	0	264	311,811
1954	3,904	279,967	1,496	352,294	0	0	0	0	766	402,141
1955	1,474	111,602	670	140,272	0	0	0	0	969	169,342
1956	2,127	179,335	1,299	225,039	0	0	0	0	9,172	351,549
1957	6,526	516,050	3,367	648,061	0	0	0	0	23,172	1,464,453
1958	11,701	945,684	6,390	1,186,919	0	0	2	2	37,898	2,286,626
1959	15,815	1,364,298	9,894	1,702,901	0	0	14	14	57,918	2,967,412
1960	23,307	1,914,521	12,798	2,379,416	0	0	28	28	123,202	4,660,834
1961	36,153	3,212,125	18,770	3,928,343	0	0	10	10	316,220	8,545,243
1962	40,012	3,543,471	29,069	4,456,905	0	0	32	32	228,202	8,875,170
1963	99,266	11,185,928	86,807	13,638,872	0	0	51	51	528,496	24,610,279
1964	170,012	18,065,455	164,709	22,494,752	0	0	7,791	7,791	590,034	41,736,063
1965	316,082	33,763,577	307,475	41,858,192	0	0	3,139	3,139	332,680	62,664,741
1966	654,194	74,485,027	681,898	91,558,322	0	0	(48)	(48)	783,728	129,110,328
1967	958,406	130,599,417	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	1,314,841	147,502,290	1,360,687	177,782,841	0	0	51,573	51,573	1,254,192	197,978,910
1969	1,726,891	140,096,646	1,085,026	174,739,535	0	0	234,232	234,232	398,183	184,473,488
1970	2,160,122	161,983,078	1,147,609	201,698,371	0	0	16,227	16,227	74,028	207,082,650
1971	1,237,573	133,903,316	738,822	156,388,245	0	0	27,204	27,204	12,457	158,624,741
1972	434,507	43,931,880	66,878	50,872,072	0	0	9	9	13,182	51,936,917
1973	256,711	39,723,010	290,020	44,495,462	0	0	25	25	8,099	45,263,853
1974	264,349	18,896,593	86,362	23,369,398	0	0	45	45	28,570	24,402,165
1975	253,838	16,732,939	83,975	20,509,108	0	0	21	21	8,226	21,318,836
1976	158,850	13,545,451	84,623	16,212,451	0	0	51	51	16,486	17,492,912
1977	96,517	11,769,352	110,833	13,776,860	0	0	28	28	21,181	15,544,384
1978	69,152	15,781,696	174,876	17,770,854	0	0	38	38	28,876	19,073,476
1979	66,847	27,627,424	343,361	30,302,095	0	0	23	23	26,668	31,857,364
1980	337,811	59,493,774	641,586	69,080,038	0	0	26	26	59,169	74,974,703
1981	(26,356)	15,661,179	224,257	15,865,338	0	0	34	34	(6,746)	15,727,601
1982	238,792	30,873,857	316,107	37,365,183	0	0	11	11	16,086	39,705,931
1983	357,812	25,056,047	187,121	33,156,254	0	0	19	19	72,225	38,006,645
1984	260,327	16,317,441	103,160	22,160,453	0	0	26	26	83,252	30,414,884
1985	187,699	10,243,779	56,162	14,164,563	0	0	29	29	16,338	28,581,729
1986	176,057	8,365,310	34,777	12,058,671	0	0	31	31	16,248	41,035,900
1987	131,163	6,955,356	36,142	9,429,051	0	0	32	32	29,062	32,523,661
1988	70,260	6,626,545	57,117	8,086,043	0	0	55	55	50,083	18,140,689
1989	227,772	18,531,680	153,200	23,885,646	0	0	44	44	43,324	33,301,366
1990	251,185	17,430,869	125,376	22,504,932	0	0	63	63	96,419	34,453,748
1991	331,235	20,792,168	132,558	26,940,917	0	0	54	54	149,922	39,811,666
1992	351,492	21,196,762	116,999	26,759,001	0	0	42	42	80,900	35,041,234
1993	646,980	29,471,748	105,693	37,283,390	0	0	30	30	59,324	53,921,790
1994	394,936	16,392,019	50,941	21,180,325	0	0	14	14	34,208	74,225,376
1995	331,286	16,078,395	72,214	20,450,220	0	0	3	3	42,395	191,525,106
1996	1,079,630	23,237,696	49,282	30,460,918	0	0	0	0	21,388	188,829,048
1997	1,914,804	13,530,777	72,335	20,071,144	0	0	3	3	34,976	65,660,156
1998	3,219,136	11,284,364	65,745	19,339,122	0	0	7	7	11,234	32,689,230
1999	5,888,075	9,063,618	54,504	21,903,478	0	0	2	2	34,616	35,159,764
2000	16,301,848	5,393,221	24,010	36,747,386	0	0	24	24	16,912	43,646,872
2001	23,613,432	2,988,800	13,047	47,455,928	0	0	20	20	68,013	50,961,384
2002	11,145,573	5,297,703	34,824	26,912,752	0	0	14	14	380,629	37,572,525
2003	4,489,351	3,956,604	(4,162)	12,364,240	0	0	0	0	590,121	19,132,158
2004	2,289,249	4,276,877	13,219	8,977,217	0	0	0	0	156,413	14,405,897
2005	809,998	6,615,802	36,038	9,021,659	0	0	0	0	123,949	12,017,452
2006	1,803,793	13,692,537	88,228	18,650,944	0	0	5	5	240,447	22,914,287
2007	2,114,612	11,569,694	63,926	16,721,574	0	0	0	0	240,866	23,580,264
2008	2,801,735	11,237,865	54,154	18,265,994	0	0	4	4	442,647	33,116,445
2009	4,252,877	22,068,434	121,873	33,227,845	0	0	13	13	938,370	47,300,619
2010	5,291,483	18,029,798	107,155	31,192,573	0	0	0	0	6,290,391	54,479,733
2011	6,234,134	12,296,215	51,517	26,764,076	0	0	1	1	2,486,456	46,997,157
2012	343,597	37,132,990	82,728	42,598,948	0	0	352	352	797,228	62,245,767
2013	223,498	43,142,284	156,418	47,913,026	0	0	303	303	115,121	62,020,270
2014	214,409	96,229,408	71,895	99,673,851	0	0	303	303	65,901	111,818,946
2015	101,342	43,136,212	15,452	44,667,141	0	0	303	303	37,025	47,312,949
2016	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2017	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2018	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2019	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2020	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2021	6,678	600,462	5,076	767,365	0	0	303	303	4,885	2,016,465
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	108,824,244	1,769,217,386	11,794,401	2,286,112,374	0	0	344,227	344,227	20,361,561	3,262,803,147

(e) Costs from Table B-10 allocated to MWDSC are reduced herein by \$16,425,374 in 1972 under provisions of Amendment No. 7 to its water contract.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor^{a b c}

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	153,778	105,673	364,827	624,278	0	0	0
1964	0	0	0	216,203	170,929	530,036	917,168	6,696	21,667	28,363
1965	0	0	0	284,369	259,943	899,371	1,443,684	13,756	36,029	49,785
1966	18,064	0	18,064	320,384	290,808	1,073,270	1,684,462	26,524	61,349	87,873
1967	41,574	0	41,574	391,262	320,989	1,187,619	1,899,870	56,469	118,263	174,732
1968	121,509	0	121,509	507,889	361,935	1,309,946	2,179,769	104,160	208,037	312,197
1969	165,289	0	165,289	610,119	397,386	1,411,700	2,419,205	122,043	242,426	364,469
1970	169,077	0	169,077	644,482	412,322	1,450,659	2,507,464	125,963	250,808	376,772
1971	171,286	0	171,286	651,366	415,439	1,457,564	2,524,369	128,402	256,371	384,773
1972	172,649	0	172,649	652,806	416,368	1,461,847	2,531,020	129,861	260,482	390,343
1973	173,649	31,366	205,015	654,199	417,018	1,465,086	2,536,303	130,843	263,040	393,883
1974	176,527	32,938	209,466	655,237	417,636	1,467,092	2,539,964	132,015	265,901	397,917
1975	184,973	36,291	221,264	657,633	418,879	1,470,816	2,547,327	133,290	269,028	402,318
1976	189,650	40,836	230,485	659,001	419,684	1,472,924	2,551,608	134,041	272,155	406,197
1977	192,592	45,096	237,688	661,724	421,449	1,478,506	2,561,681	135,754	278,799	414,553
1978	195,860	49,178	245,038	665,377	423,747	1,485,299	2,574,423	141,271	292,281	433,552
1979	199,390	53,340	252,730	670,749	427,108	1,494,207	2,592,065	142,362	297,569	439,931
1980	209,132	67,748	276,880	674,612	429,296	1,499,843	2,603,750	143,530	303,969	447,499
1981	222,599	87,408	310,007	684,845	435,629	1,515,357	2,635,831	148,789	327,544	476,334
1982	234,191	106,918	341,110	682,801	434,108	1,512,014	2,628,923	148,004	320,657	468,661
1983	262,160	151,259	413,419	684,129	434,532	1,513,393	2,632,054	148,213	317,658	465,871
1984	326,072	224,245	550,317	695,280	441,230	1,530,670	2,667,181	149,853	323,275	473,127
1985	455,836	364,305	820,141	707,772	448,410	1,548,594	2,704,775	151,658	328,761	480,419
1986	819,636	692,479	1,512,115	709,741	449,390	1,551,318	2,710,449	152,545	332,779	485,325
1987	1,360,688	1,559,243	2,919,931	712,396	451,007	1,555,828	2,719,231	154,806	348,472	503,277
1988	1,771,651	2,208,121	3,979,773	716,686	453,514	1,562,984	2,733,184	161,346	417,591	578,937
1989	1,891,484	2,433,160	4,324,645	725,624	459,332	1,578,655	2,763,611	169,453	494,247	663,700
1990	1,955,330	2,514,151	4,469,481	733,728	464,692	1,592,216	2,790,635	177,387	557,384	734,771
1991	1,978,582	2,557,403	4,535,985	750,836	476,459	1,625,032	2,852,327	189,050	639,235	828,285
1992	1,983,860	2,562,121	4,545,981	781,435	496,722	1,675,407	2,953,204	204,822	754,678	959,500
1993	1,986,897	2,565,427	4,552,325	795,794	505,773	1,698,585	3,000,152	224,056	941,300	1,165,356
1994	1,993,467	2,572,330	4,565,797	806,225	512,498	1,716,961	3,035,684	286,878	1,585,162	1,872,040
1995	1,997,323	2,576,836	4,574,159	810,700	515,639	1,729,386	3,055,725	517,412	4,095,799	4,613,211
1996	1,998,994	2,578,433	4,577,427	818,605	520,936	1,743,439	3,082,980	1,187,010	12,569,247	13,756,257
1997	2,000,111	2,579,484	4,579,594	822,655	523,583	1,750,461	3,096,699	1,808,546	20,578,178	22,386,724
1998	2,001,225	2,585,478	4,586,703	829,385	527,976	1,762,113	3,119,474	1,985,645	22,700,288	24,685,933
1999	2,002,204	2,586,690	4,588,893	831,614	529,331	1,765,656	3,126,600	2,035,260	23,293,767	25,329,027
2000	2,006,043	2,592,730	4,598,773	990,970	533,508	1,777,485	3,301,963	2,088,005	23,838,744	25,926,749
2001	2,326,139	2,781,847	5,107,986	1,124,194	535,165	1,782,101	3,441,460	2,116,046	24,156,352	26,272,399
2002	2,326,578	2,782,687	5,109,265	1,138,596	550,866	1,890,059	3,579,521	2,120,253	24,187,702	26,307,955
2003	2,327,923	2,785,486	5,113,410	1,223,310	620,921	2,236,138	4,080,370	2,123,974	24,209,864	26,333,838
2004	2,331,606	2,786,790	5,118,396	1,356,995	700,388	2,511,867	4,569,250	2,123,821	24,214,474	26,338,295
2005	2,342,154	2,788,128	5,130,282	1,393,788	721,344	2,760,542	4,875,674	2,124,361	24,217,270	26,341,630
2006	2,346,406	2,792,361	5,138,767	1,429,305	742,250	2,855,355	5,026,909	2,123,712	24,206,368	26,330,079
2007	2,409,446	2,793,742	5,203,189	1,500,475	783,535	2,954,702	5,238,711	2,124,086	24,210,150	26,334,236
2008	2,643,264	2,796,747	5,440,011	1,573,103	825,565	3,055,571	5,454,240	2,125,000	24,215,281	26,340,281
2009	3,224,641	2,801,078	6,025,719	1,709,062	904,139	3,243,652	5,856,853	2,126,333	24,220,779	26,347,112
2010	3,314,471	2,802,546	6,117,017	2,001,153	1,074,294	3,649,467	6,724,915	2,126,867	24,225,616	26,352,483
2011	3,344,889	2,802,844	6,147,732	2,699,461	1,299,165	4,213,505	8,212,130	2,131,947	24,235,057	26,367,004
2012	3,357,047	2,804,026	6,161,073	3,195,909	1,548,508	4,814,564	9,558,982	2,138,696	24,247,833	26,386,529
2013	3,366,123	2,815,631	6,181,754	3,243,238	1,582,897	4,806,642	9,632,777	2,186,682	24,529,882	26,716,564
2014	3,390,475	2,837,320	6,227,794	3,205,105	1,538,212	4,697,414	9,440,732	2,200,028	24,637,803	26,837,831
2015	3,546,391	3,148,681	6,695,072	3,147,564	1,461,132	4,362,030	8,970,726	2,201,191	24,729,002	26,930,193
2016	3,539,728	3,160,919	6,700,647	3,118,068	1,436,984	4,208,108	8,763,160	2,191,150	24,794,691	26,985,841
2017	3,514,517	3,162,482	6,676,999	3,044,383	1,407,385	4,095,888	8,547,656	2,161,420	24,819,869	26,981,289
2018	3,425,270	3,164,099	6,589,369	2,925,652	1,367,044	3,975,765	8,268,461	2,113,951	24,815,079	26,929,030
2019	3,377,143	3,165,779	6,542,922	2,821,126	1,332,219	3,876,298	8,029,643	2,096,299	24,868,927	26,965,226
2020	3,374,512	3,167,529	6,542,040	2,786,367	1,317,935	3,839,723	7,944,025	2,092,619	24,952,461	27,045,080
2021	3,373,749	3,169,358	6,543,107	2,780,254	1,315,501	3,835,311	7,931,065	2,090,432	25,043,008	27,133,439
2022	3,374,045	3,171,279	6,545,324	2,780,017	1,315,289	3,833,645	7,928,952	2,089,237	25,139,822	27,229,059
2023	3,372,902	3,137,747	6,510,649	2,778,608	1,314,639	3,830,406	7,923,653	2,088,255	25,137,264	27,225,519
2024	3,369,622	3,136,113	6,505,735	2,777,546	1,314,021	3,828,400	7,919,967	2,087,083	25,134,403	27,221,486
2025	3,360,007	3,132,536	6,492,542	2,775,210	1,312,778	3,824,676	7,912,664	2,085,808	25,131,277	27,217,084
2026	3,354,663	3,127,782	6,482,445	2,773,736	1,311,973	3,822,568	7,908,277	2,085,057	25,128,149	27,213,206
2027	3,351,291	3,123,347	6,474,639	2,770,749	1,310,208	3,816,985	7,897,942	2,083,344	25,121,505	27,204,849
2028	3,347,552	3,119,088	6,466,640	2,766,740	1,307,910	3,810,192	7,884,842	2,077,827	25,108,023	27,185,850
2029	3,343,514	3,114,720	6,458,234	2,760,742	1,304,548	3,801,285	7,866,575	2,076,736	25,102,736	27,179,472
2030	3,332,358	3,099,258	6,431,616	2,756,546	1,302,361	3,795,649	7,854,556	2,075,535	25,096,335	27,171,903
2031	3,316,941	3,078,192	6,395,133	2,745,063	1,296,028	3,780,135	7,821,226	2,070,309	25,072,760	27,143,069
2032	3,303,644	3,057,247	6,360,891	2,747,580	1,297,548	3,783,478	7,828,606	2,071,094	25,079,648	27,150,742
2033	3,271,585	3,009,796	6,281,381	2,746,338	1,297,125	3,782,099	7,825,562	2,070,885	25,082,647	27,153,532
2034	3,198,488	2,933,180	6,131,668	2,733,916	1,290,426	3,764,821	7,789,163	2,069,245	25,077,030	27,146,275
2035	3,050,345	2,786,878	5,837,223	2,720,069	1,283,247	3,746,898	7,750,214	2,067,440	25,071,543	27,138,983
TOTAL	141,179,002	140,792,265	281,971,267	111,072,381	57,464,426	182,571,744	351,108,551	87,832,472	983,683,549	1,071,516,021

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor ^{a b c d}

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (d) Industrial	Agricultural				
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	0	2,725
1965	0	0	6,029	64,284	9,284	0	0	0	0	79,598
1966	0	0	12,039	120,256	17,073	0	0	0	0	149,368
1967	0	0	26,257	233,262	34,350	0	0	0	0	293,869
1968	78,526	1,805	48,950	335,771	48,966	428,287	9,407	4,806	66,211	1,022,729
1969	78,663	5,415	57,418	392,005	52,536	879,563	10,158	5,224	250,520	1,731,501
1970	86,213	5,415	59,224	423,404	53,922	1,069,813	10,446	5,433	185,390	1,899,260
1971	98,294	5,415	60,329	444,522	54,712	1,420,896	10,612	5,851	197,281	2,297,912
1972	109,826	5,415	60,945	454,227	55,075	2,127,668	10,694	11,213	608,598	3,443,660
1973	120,809	5,415	61,370	458,449	55,248	2,453,942	10,736	6,478	235,396	3,407,843
1974	183,354	5,415	61,890	460,485	55,349	2,748,051	10,770	7,253	390,719	3,923,286
1975	222,700	5,415	62,452	462,798	55,490	3,291,408	10,812	7,473	466,220	4,584,768
1976	169,796	5,415	62,719	464,655	55,679	3,548,111	10,853	8,440	333,523	4,659,191
1977	166,935	5,415	63,362	467,359	55,965	3,887,708	10,914	7,732	318,892	4,984,282
1978	178,467	0	65,796	469,216	56,156	4,321,517	11,020	8,150	342,133	5,452,455
1979	211,657	5,415	66,111	471,978	56,491	4,745,216	11,086	8,359	385,054	5,961,367
1980	225,143	5,415	66,399	474,721	56,828	5,178,100	11,157	11,911	387,535	6,417,209
1981	225,143	5,415	67,986	491,115	58,770	5,667,043	11,565	8,986	410,776	6,946,799
1982	225,143	5,415	67,996	488,835	58,707	6,118,323	11,552	9,403	433,477	7,418,852
1983	235,577	5,415	68,332	493,076	59,377	6,632,087	11,685	7,878	51,606	7,565,034
1984	247,657	5,415	68,950	498,702	60,083	6,961,249	11,834	10,030	338,409	8,202,329
1985	259,189	5,415	69,678	506,586	61,243	7,412,513	12,069	10,239	246,190	8,583,123
1986	270,721	5,415	69,966	508,983	61,587	7,532,855	12,141	10,657	525,361	8,997,686
1987	282,253	5,415	70,471	512,652	62,116	8,315,973	12,251	10,866	548,062	9,820,060
1988	293,784	5,415	70,832	515,513	62,526	8,741,509	12,334	11,284	570,763	10,283,959
1989	305,316	5,415	71,717	519,169	63,150	9,048,476	12,501	11,702	594,004	10,631,450
1990	158,424	5,415	73,153	537,527	65,389	9,367,402	12,936	11,911	640,487	10,872,645
1991	293,296	5,415	75,796	566,573	69,966	9,367,402	13,762	11,911	640,487	11,044,609
1992	316,848	5,415	78,990	597,260	74,817	9,367,402	14,757	11,911	640,487	11,107,886
1993	316,848	5,415	80,482	610,123	76,657	9,367,402	15,125	11,911	640,487	11,124,449
1994	316,848	5,415	82,105	619,494	77,936	9,367,402	15,398	11,911	640,487	11,136,996
1995	316,848	5,415	83,398	626,231	78,890	9,367,402	15,608	11,911	640,487	11,146,191
1996	293,071	5,415	87,367	635,384	80,221	9,046,179	15,962	11,911	640,487	10,815,997
1997	293,071	5,415	90,231	639,177	80,707	8,980,187	16,133	11,911	640,487	10,757,319
1998	293,070	5,415	92,940	652,602	82,732	8,727,566	16,589	11,911	640,487	10,523,312
1999	293,070	5,415	94,237	659,509	83,778	8,727,566	16,824	11,911	640,487	10,532,797
2000	293,070	5,415	95,750	667,629	85,008	8,083,957	17,096	11,911	640,487	9,900,324
2001	293,070	5,415	96,315	670,255	85,354	7,952,170	17,172	11,911	640,487	9,772,148
2002	315,307	5,415	96,772	672,352	85,648	7,952,170	17,237	11,911	601,527	9,758,339
2003	315,307	5,415	97,715	680,183	86,829	7,952,170	17,477	11,911	599,304	9,766,310
2004	315,307	5,415	97,386	675,640	86,048	7,940,077	45,097	11,911	516,522	9,683,402
2005	315,307	5,415	97,537	676,671	86,174	7,940,077	45,124	11,911	516,522	9,694,738
2006	315,307	5,415	97,890	679,912	86,639	7,940,077	46,914	11,911	514,828	9,698,892
2007	315,307	5,415	97,938	681,004	86,686	7,940,077	46,924	11,911	514,828	9,700,090
2008	315,307	5,415	98,146	682,708	86,852	7,940,077	46,958	11,911	514,828	9,702,202
2009	315,307	5,415	98,640	686,835	87,490	7,940,077	47,090	11,911	514,828	9,707,592
2010	276,868	5,415	98,832	689,808	87,723	7,767,736	47,136	11,911	475,937	9,461,367
2011	276,868	5,415	101,249	694,231	88,180	7,767,736	47,305	11,911	475,937	9,468,832
2012	276,868	5,415	104,472	697,897	88,655	7,767,736	47,504	11,911	475,937	9,476,395
2013	300,646	5,415	120,000	710,613	90,543	8,144,905	48,383	11,911	475,937	9,908,353
2014	300,646	5,415	125,601	758,822	98,104	8,144,905	50,042	11,911	475,937	9,971,383
2015	284,173	5,415	125,263	715,732	92,071	8,144,905	50,723	11,911	475,937	9,906,130
2016	284,173	5,415	120,049	663,145	84,735	8,144,905	50,822	11,911	475,937	9,841,091
2017	284,173	5,415	105,888	550,948	67,560	8,144,905	50,839	11,911	475,937	9,697,577
2018	284,173	5,415	83,256	449,277	53,048	8,144,905	41,451	11,911	475,937	9,549,372
2019	284,173	5,415	74,850	393,913	49,588	8,144,905	40,718	11,911	475,937	9,481,410
2020	262,207	5,415	73,108	363,419	48,315	8,144,905	40,450	11,911	475,937	9,425,668
2021	262,207	5,415	72,071	343,248	47,644	8,144,905	40,305	11,911	475,937	9,403,642
2022	262,207	5,415	71,526	334,538	47,406	8,144,905	40,244	11,911	475,937	9,394,089
2023	262,207	5,415	71,100	330,316	47,233	8,144,905	40,202	11,911	475,937	9,389,226
2024	262,207	5,415	70,581	328,281	47,132	8,144,905	40,168	11,911	475,937	9,386,536
2025	262,207	5,415	70,018	325,967	46,991	8,144,905	40,126	11,911	475,937	9,383,478
2026	262,207	5,415	69,751	324,110	46,802	8,144,905	40,085	11,911	475,937	9,381,124
2027	262,207	5,415	69,109	321,406	46,516	8,144,905	40,024	11,911	475,937	9,377,430
2028	262,207	5,415	66,675	319,549	46,325	8,144,905	39,919	11,911	475,937	9,372,842
2029	262,207	5,415	66,360	316,787	45,989	8,144,905	39,852	11,911	475,937	9,369,364
2030	262,207	5,415	66,072	314,044	45,653	8,144,905	39,781	11,911	475,937	9,365,925
2031	262,207	5,415	64,485	297,650	43,711	8,144,905	39,373	11,911	475,937	9,345,594
2032	262,207	5,415	64,475	299,930	43,773	8,144,905	39,386	11,911	475,937	9,347,939
2033	262,207	5,415	64,138	295,689	43,104	8,144,905	39,253	11,911	475,937	9,342,559
2034	262,207	5,415	63,521	290,063	42,396	8,144,905	39,104	11,911	475,937	9,335,460
2035	262,207	5,415	62,792	282,179	41,238	8,144,905	38,869	11,911	475,937	9,325,453
TOTAL	17,323,229	359,195	5,427,969	35,060,656	4,484,940	484,433,170	1,858,842	737,274	32,239,513	581,924,788

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.
- (d) Charges under Amendment No. 18 of the water supply contract with Kern County Water Agency.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor^{a b c}

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,853	0	0	0	726	0	0	0	51,729	0
1964	63,658	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	119,982	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,068	35,344
1966	218,279	101,265	62,476	12,478	76,887	3,753	94,978	27,679	232,502	61,465
1967	422,318	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	679,706	419,913	206,952	38,551	245,877	11,781	304,194	87,293	729,849	194,527
1969	987,488	623,855	318,583	57,301	368,426	17,249	455,580	127,220	1,136,415	302,649
1970	1,290,148	780,905	451,031	84,796	520,243	23,427	633,777	171,297	1,691,461	443,708
1971	1,553,528	947,955	595,102	120,210	700,914	28,845	841,925	208,821	2,394,083	619,779
1972	1,689,004	1,057,729	671,099	137,454	795,465	31,306	955,155	226,497	2,808,504	720,983
1973	1,739,896	1,072,353	696,065	142,143	825,044	32,281	991,932	233,340	2,945,564	756,530
1974	1,758,456	1,119,097	707,278	146,331	839,031	32,602	1,005,446	235,688	3,035,230	777,084
1975	1,782,456	1,133,730	724,296	150,105	861,611	33,017	1,033,915	238,700	3,117,604	798,777
1976	1,796,065	1,146,440	736,112	152,796	878,290	33,269	1,054,893	240,432	3,195,714	819,552
1977	1,808,676	1,159,645	744,719	154,692	890,124	33,485	1,070,141	242,010	3,244,723	832,585
1978	1,819,175	1,178,827	750,463	156,009	898,032	33,676	1,080,628	243,377	3,274,845	840,506
1979	1,834,884	1,203,029	756,140	157,141	904,987	33,943	1,089,933	245,346	3,296,693	846,199
1980	1,853,483	1,251,115	762,012	158,251	912,220	34,247	1,099,734	247,608	3,317,247	851,720
1981	1,950,494	1,341,930	796,385	164,014	950,529	35,899	1,148,018	259,877	3,421,183	879,634
1982	1,942,165	1,373,310	789,720	163,563	945,667	35,768	1,142,576	258,879	3,413,856	877,416
1983	2,023,096	1,417,521	809,320	167,581	971,692	37,104	1,175,975	268,896	3,486,248	897,190
1984	2,130,256	1,444,269	834,564	173,473	1,006,034	38,871	1,215,067	282,134	3,594,542	926,815
1985	2,208,999	1,459,608	851,720	177,807	1,031,452	40,260	1,247,348	291,738	3,673,311	948,379
1986	2,255,588	1,467,967	863,875	180,992	1,049,921	40,927	1,279,770	297,214	3,730,198	963,927
1987	2,299,485	1,473,613	876,262	183,969	1,068,826	41,390	1,295,449	301,992	3,783,895	978,588
1988	2,317,266	1,479,311	885,510	186,235	1,083,081	41,677	1,314,003	304,089	3,824,257	989,568
1989	2,330,935	1,488,520	889,632	187,412	1,088,857	41,852	1,321,448	305,475	3,846,509	995,456
1990	2,386,678	1,511,363	912,986	192,472	1,118,024	42,727	1,357,622	312,010	3,918,238	1,014,854
1991	2,423,381	1,531,009	932,659	197,604	1,147,282	43,112	1,393,484	315,536	3,997,480	1,036,359
1992	2,468,365	1,552,255	953,475	203,996	1,179,589	43,744	1,432,614	320,432	4,102,102	1,064,912
1993	2,502,941	1,571,262	969,784	210,989	1,203,773	44,253	1,459,813	324,519	4,213,571	1,095,444
1994	2,537,646	1,589,084	983,986	220,171	1,223,934	44,800	1,479,367	328,488	4,420,076	1,151,617
1995	2,563,361	1,598,044	992,587	225,248	1,236,069	45,193	1,491,558	331,367	4,547,097	1,186,123
1996	2,588,882	1,614,052	1,001,843	229,526	1,248,440	45,599	1,504,760	334,344	4,654,074	1,215,084
1997	2,605,838	1,625,439	1,010,119	232,003	1,258,944	45,868	1,516,994	336,316	4,875,746	1,268,666
1998	2,630,554	1,639,326	1,017,568	233,373	1,268,787	46,279	1,528,254	339,344	5,036,613	1,290,750
1999	2,643,878	1,650,711	1,022,130	235,684	1,274,800	46,503	1,540,444	341,005	5,243,554	1,307,788
2000	2,659,357	1,668,668	1,028,194	237,960	1,283,376	46,776	1,552,636	343,063	5,456,174	1,321,137
2001	2,667,537	2,810,610	1,032,076	239,333	1,288,723	46,930	2,066,849	406,266	6,393,264	1,330,966
2002	2,692,009	2,813,302	1,035,440	240,242	1,293,682	47,103	2,073,254	407,540	7,573,077	1,338,562
2003	2,791,941	2,821,544	1,038,199	240,913	1,297,176	47,248	2,078,094	408,732	8,152,654	1,344,008
2004	2,699,312	2,821,464	1,093,764	241,041	1,297,553	47,200	2,078,783	408,433	8,388,128	1,345,634
2005	2,703,221	2,824,882	6,707,252	241,378	2,057,678	47,269	2,081,849	409,006	8,518,222	1,347,958
2006	2,714,779	2,834,318	6,773,756	242,114	2,070,374	47,467	2,088,280	410,687	8,579,152	1,351,714
2007	2,735,241	2,859,547	6,902,860	243,649	2,094,341	47,804	2,100,263	413,777	8,705,835	1,358,632
2008	2,751,359	2,877,912	7,027,088	245,022	2,116,709	48,083	2,110,179	416,209	8,841,052	1,365,392
2009	2,758,961	2,892,467	7,116,467	248,837	2,135,010	48,217	2,115,146	417,262	9,057,078	1,381,859
2010	2,797,790	2,928,777	7,498,577	252,814	2,233,878	48,863	2,179,684	423,098	9,372,610	1,399,753
2011	2,842,261	2,964,990	7,672,744	257,044	2,277,749	49,590	2,213,583	429,701	9,740,765	1,418,996
2012	2,865,018	2,985,205	7,818,557	261,044	2,321,245	49,952	2,249,644	432,945	10,169,786	1,438,373
2013	2,857,686	3,029,368	8,373,258	267,943	2,414,901	50,409	2,294,742	436,531	10,265,620	1,460,351
2014	2,899,299	3,041,034	8,980,135	268,074	2,512,653	50,523	2,295,263	437,268	10,330,640	1,478,446
2015	2,876,714	3,030,541	11,033,403	268,317	2,791,635	50,211	2,346,125	434,311	10,373,154	1,490,108
2016	2,788,494	2,978,607	11,931,916	264,819	2,893,160	48,741	2,310,744	422,191	10,321,888	1,476,543
2017	2,587,801	2,846,314	11,700,428	254,000	2,798,925	45,269	2,206,658	394,238	10,124,226	1,423,294
2018	2,333,877	2,560,162	11,367,445	239,102	2,669,565	40,832	2,059,628	357,520	9,831,025	1,345,230
2019	2,029,692	2,265,847	10,915,774	220,539	2,502,210	35,427	1,868,481	311,936	9,427,882	1,238,033
2020	1,730,778	2,036,934	10,370,621	193,239	2,295,817	29,314	1,693,413	261,549	8,876,403	1,097,938
2021	1,471,315	1,791,734	9,703,074	158,029	2,045,661	23,964	1,442,689	218,729	8,177,510	922,874
2022	1,339,952	1,634,173	8,800,046	141,000	1,840,684	21,574	1,308,589	198,477	7,767,005	822,727
2023	1,289,060	1,626,448	8,096,285	136,310	1,719,416	20,599	1,263,192	190,440	7,629,945	787,180
2024	1,270,500	1,567,575	7,979,718	132,122	1,691,198	20,278	1,246,656	187,629	7,540,279	766,625
2025	1,246,501	1,549,711	7,864,464	128,348	1,655,349	19,864	1,214,886	184,053	7,457,905	744,933
2026	1,232,892	1,531,462	7,760,595	125,658	1,626,236	19,611	1,192,169	182,034	7,379,795	724,158
2027	1,220,281	1,512,951	7,684,243	123,761	1,605,251	19,395	1,175,731	180,222	7,330,786	711,125
2028	1,209,781	1,485,115	7,647,026	122,444	1,593,092	19,204	1,164,870	178,705	7,300,664	703,203
2029	1,194,063	1,446,802	7,614,696	121,312	1,582,537	18,937	1,154,484	176,493	7,278,816	697,511
2030	1,175,473	1,369,588	7,588,109	120,202	1,572,506	18,633	1,143,584	173,979	7,258,262	691,990
2031	1,078,463	1,226,535	7,449,498	114,439	1,520,117	16,981	1,081,589	159,816	7,154,326	664,076
2032	1,086,791	1,175,030	7,462,301	114,890	1,525,808	17,113	1,092,817	161,449	7,161,653	666,294
2033	1,005,860	1,102,479	7,380,770	110,872	1,491,417	15,776	1,055,406	150,783	7,089,261	646,520
2034	898,701	1,060,242	7,268,214	104,980	1,445,282	14,009	1,007,328	136,794	6,980,968	616,895
2035	819,958	1,038,521	7,184,288	100,646	1,410,845	12,620	973,644	126,897	6,902,198	595,331
TOTAL	139,493,589	122,463,079	290,652,891	12,491,842	100,275,091	2,447,000	100,934,925	19,757,178	411,926,950	68,652,907

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor^{a b c}

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	690,812	0	777,120	0	0	0	0	0	1,401,398
1964	21,736	1,260,513	9,378	1,601,758	0	0	0	0	0	2,550,013
1965	21,866	2,180,589	17,766	2,717,874	0	0	405	405	0	4,291,345
1966	37,965	3,900,172	33,426	4,863,325	0	0	565	565	0	6,803,657
1967	71,283	7,693,703	68,155	9,554,331	0	0	562	562	0	11,964,937
1968	120,094	14,345,147	133,299	17,517,184	0	0	564	564	0	21,153,952
1969	187,059	21,857,456	202,589	26,641,879	0	0	3,191	3,191	0	31,325,535
1970	275,010	28,992,595	257,859	35,616,156	0	0	15,121	15,121	0	40,583,849
1971	385,025	37,242,413	316,307	45,954,907	0	0	15,947	15,947	0	51,349,195
1972	448,055	44,062,125	353,935	53,957,311	0	0	17,332	17,332	0	60,512,315
1973	470,185	46,299,581	357,342	56,562,254	0	0	17,333	17,333	0	63,122,632
1974	483,259	48,322,678	372,112	58,834,293	0	0	17,334	17,334	0	65,922,259
1975	496,722	49,285,084	376,511	60,032,526	0	0	17,337	17,337	0	67,805,539
1976	509,650	50,137,295	380,788	61,081,294	0	0	17,338	17,338	0	68,946,113
1977	517,741	50,827,166	385,097	61,910,804	0	0	17,340	17,340	0	70,126,348
1978	522,656	51,426,581	390,742	62,615,518	0	0	17,342	17,342	0	71,338,328
1979	526,178	52,230,344	399,649	63,524,477	0	0	17,344	17,344	0	72,787,912
1980	529,583	53,637,412	417,136	65,071,768	0	0	17,345	17,345	0	74,834,452
1981	546,787	56,667,437	449,812	68,611,998	0	0	17,346	17,346	0	78,998,315
1982	545,445	57,465,063	461,234	69,414,661	0	0	17,348	17,348	0	80,289,554
1983	557,607	59,037,472	477,333	71,327,035	0	0	17,348	17,348	0	82,420,760
1984	575,830	60,313,580	486,863	73,022,296	0	0	17,349	17,349	0	84,932,600
1985	589,089	61,144,629	492,117	74,156,456	0	0	17,351	17,351	0	86,762,265
1986	598,648	61,666,346	494,977	74,890,352	0	0	17,352	17,352	0	88,613,279
1987	607,664	62,094,710	496,758	75,502,600	0	0	17,354	17,354	0	91,482,453
1988	614,419	62,452,912	498,619	75,990,946	0	0	17,355	17,355	0	93,584,155
1989	618,059	62,796,236	501,579	76,411,970	0	0	17,358	17,358	0	94,812,732
1990	629,935	63,762,459	509,566	77,668,933	0	0	17,360	17,360	0	96,553,826
1991	643,119	64,677,355	516,147	78,854,527	0	0	17,364	17,364	0	98,133,097
1992	660,626	65,776,353	523,154	80,281,619	0	0	17,367	17,367	0	99,865,557
1993	679,343	66,905,041	529,383	81,710,118	0	0	17,369	17,369	0	101,569,769
1994	714,062	68,486,622	535,055	83,714,909	0	0	17,370	17,370	0	104,342,796
1995	735,431	69,373,540	537,812	84,863,429	0	0	17,371	17,371	0	108,270,087
1996	753,512	70,251,056	541,753	85,982,925	0	0	17,371	17,371	0	118,232,958
1997	812,976	71,530,953	544,467	87,664,329	0	0	17,371	17,371	0	128,502,036
1998	919,464	72,283,436	548,490	89,296,270	0	0	0	0	0	132,211,691
1999	1,100,324	72,917,423	552,184	90,385,428	0	0	0	0	0	133,962,746
2000	1,434,718	73,432,162	555,279	92,837,952	0	0	0	0	0	136,565,761
2001	2,371,146	73,741,965	556,658	94,952,323	0	0	0	0	0	139,546,316
2002	3,744,046	73,915,736	557,417	97,730,012	0	0	0	0	0	142,485,092
2003	4,400,395	74,227,711	559,468	99,318,086	0	0	17,375	17,375	0	144,629,395
2004	4,668,374	74,463,889	559,219	100,112,793	0	0	17,375	17,375	0	145,849,512
2005	4,807,002	68,353,111	560,020	100,658,848	0	0	17,375	17,375	0	146,718,548
2006	4,856,807	68,688,841	562,236	101,220,523	0	0	17,375	17,375	0	147,432,545
2007	4,969,532	69,406,979	567,749	102,406,211	0	0	17,376	17,376	0	148,899,813
2008	5,103,981	70,008,643	571,814	103,483,442	0	0	17,376	17,376	0	150,437,551
2009	5,285,420	70,640,220	575,321	104,672,266	0	0	17,376	17,376	0	152,626,918
2010	5,566,284	71,863,098	583,369	107,148,596	0	0	17,377	17,377	0	155,821,754
2011	5,923,121	72,904,897	590,595	109,286,036	0	0	17,377	17,377	0	159,499,112
2012	6,353,031	73,609,034	594,148	111,147,982	0	0	17,377	17,377	0	162,748,339
2013	6,369,147	74,938,073	599,991	113,358,019	0	0	17,402	17,402	0	165,814,869
2014	6,380,288	76,804,726	601,949	116,080,297	0	0	17,424	17,424	0	168,575,461
2015	6,387,601	80,720,753	598,916	122,401,789	0	0	17,042	17,042	0	174,920,951
2016	6,379,279	81,268,199	584,442	123,669,023	0	0	16,905	16,905	0	175,976,667
2017	6,346,490	77,719,450	550,115	118,997,208	0	0	16,932	16,932	0	170,917,660
2018	6,298,226	71,399,188	485,387	110,987,188	0	0	16,954	16,954	0	162,340,374
2019	6,231,830	64,325,260	416,520	101,789,430	0	0	14,353	14,353	0	152,822,984
2020	6,144,472	57,713,168	361,710	92,805,355	0	0	2,451	2,451	0	143,764,619
2021	6,035,076	50,114,620	303,733	82,409,008	0	0	1,652	1,652	0	133,421,914
2022	5,972,696	44,293,599	266,599	74,407,120	0	0	296	296	0	125,504,841
2023	5,950,567	42,826,625	263,193	71,799,262	0	0	296	296	0	122,848,605
2024	5,937,493	40,923,113	248,422	69,511,609	0	0	295	295	0	120,545,627
2025	5,924,029	40,072,213	244,023	68,306,279	0	0	292	292	0	119,312,340
2026	5,911,101	39,324,488	239,747	67,249,947	0	0	291	291	0	118,235,290
2027	5,903,011	38,711,513	235,437	66,413,707	0	0	289	289	0	117,368,855
2028	5,898,095	38,147,823	229,792	65,699,816	0	0	287	287	0	116,610,277
2029	5,894,574	37,374,312	220,886	64,775,421	0	0	285	285	0	115,649,352
2030	5,891,169	35,990,757	203,398	63,197,651	0	0	284	284	0	114,021,934
2031	5,873,964	33,079,051	170,722	59,589,577	0	0	283	283	0	110,294,880
2032	5,875,307	32,274,458	159,301	58,773,211	0	0	281	281	0	109,461,670
2033	5,863,145	30,772,345	143,201	56,827,836	0	0	280	280	0	107,431,150
2034	5,844,921	29,595,343	133,671	55,107,348	0	0	279	279	0	105,510,194
2035	5,831,663	28,840,082	128,417	53,965,110	0	0	278	278	0	104,017,261
TOTAL	217,154,407	3,876,479,736	28,952,267	5,391,681,863	0	0	786,394	786,394	0	7,678,988,885

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.

TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	9,699	8,868	21,132	39,699	0	0	0
1963	0	0	0	38,048	34,788	82,896	155,732	0	0	0
1964	0	0	0	41,148	38,323	91,320	170,791	0	0	0
1965	0	0	0	78,529	75,616	195,793	349,938	0	0	0
1966	0	0	0	79,753	78,779	218,543	377,075	0	0	0
1967	0	0	0	127,896	123,667	335,224	586,787	0	0	0
1968	130	0	130	126,058	120,563	333,506	580,127	11,800	21,770	33,570
1969	80,875	0	80,875	145,411	138,050	372,585	656,046	63,113	116,435	179,548
1970	94,872	0	94,872	128,993	120,245	320,664	569,902	74,187	136,867	211,054
1971	45,579	0	45,579	113,071	108,346	296,004	517,421	74,011	136,541	210,552
1972	37,895	0	37,895	122,407	117,483	334,366	574,256	79,196	146,107	225,303
1973	32,993	0	32,993	122,738	116,785	325,726	565,249	75,714	139,683	215,397
1974	46,498	0	46,498	154,435	146,929	403,080	704,444	76,530	141,189	217,719
1975	37,707	0	37,707	189,175	182,087	513,823	885,085	92,605	170,845	263,450
1976	60,786	0	60,786	203,064	193,435	524,813	921,312	94,935	175,144	270,079
1977	78,400	0	78,400	179,869	169,065	500,101	849,035	102,945	189,922	292,867
1978	56,318	0	56,318	239,301	228,855	647,828	1,115,984	104,060	191,978	296,038
1979	73,852	0	73,852	236,986	232,105	666,742	1,135,833	100,748	185,868	286,616
1980	81,769	0	81,769	389,575	372,185	1,010,830	1,772,590	126,328	233,105	359,433
1981	101,340	0	101,340	317,408	302,272	834,257	1,453,937	140,208	258,712	398,920
1982	191,987	0	191,987	386,742	369,633	1,098,844	1,855,219	142,045	262,101	404,146
1983	80,215	0	80,215	438,536	428,973	1,269,373	2,136,882	171,001	315,523	486,524
1984	106,485	0	106,485	591,243	565,721	1,817,629	2,974,593	201,768	372,284	574,052
1985	215,341	0	215,341	674,975	655,490	1,840,211	3,170,676	242,935	448,233	691,168
1986	203,704	0	203,704	613,273	583,077	1,784,056	2,980,406	233,000	429,904	662,904
1987	295,505	0	295,505	687,629	652,468	2,000,817	3,340,914	230,484	463,838	694,322
1988	312,677	(58)	312,619	676,847	655,274	1,910,092	3,242,213	258,807	561,030	819,837
1989	403,330	688,185	1,091,515	716,831	712,354	1,897,149	3,326,334	244,772	668,476	913,248
1990	658,942	674,944	1,333,886	782,589	780,305	2,129,966	3,692,860	310,222	677,025	987,247
1991	726,717	860,903	1,587,620	543,178	524,741	1,520,569	2,588,488	302,369	673,858	976,227
1992	483,580	712,313	1,195,893	796,058	855,050	2,253,496	3,904,604	346,220	736,477	1,082,697
1993	524,000	708,129	1,232,129	1,280,736	1,261,431	3,338,742	5,880,909	386,060	734,138	1,120,198
1994	573,814	658,274	1,232,088	1,368,665	1,312,746	3,560,310	6,241,721	481,022	888,287	1,369,309
1995	539,407	660,770	1,200,177	1,232,272	1,187,201	3,216,470	5,635,943	477,929	881,323	1,359,252
1996	604,992	1,011,298	1,616,290	1,185,220	1,124,968	3,007,330	5,317,518	649,161	1,197,179	1,846,340
1997	563,579	741,881	1,305,460	1,029,670	968,999	2,667,649	4,666,318	406,652	749,805	1,156,457
1998	461,844	661,193	1,123,037	1,064,729	1,174,897	3,502,733	5,742,359	810,087	3,051,492	3,861,579
1999	614,991	1,009,121	1,624,112	1,248,430	1,289,931	5,148,028	7,686,389	797,663	3,104,794	3,902,457
2000	779,177	1,498,187	2,277,364	2,193,462	1,305,039	3,780,118	7,278,619	718,391	3,165,180	3,883,571
2001	652,547	1,445,506	2,098,053	4,195,008	1,038,395	3,545,328	8,778,731	734,072	2,958,617	3,692,689
2002	1,097,576	1,872,253	2,969,829	8,258,786	1,357,138	6,058,171	15,674,095	770,581	3,349,800	4,120,381
2003	1,176,494	2,260,317	3,436,811	4,932,697	1,071,991	3,587,583	9,592,271	827,744	3,546,882	4,374,626
2004	1,627,310	2,360,776	3,988,086	2,612,652	1,294,583	3,576,109	7,483,344	829,864	3,485,969	4,315,733
2005	920,025	1,801,485	2,721,510	2,405,461	1,136,447	2,965,766	6,507,674	879,363	3,798,743	4,678,106
2006	846,931	1,421,574	2,268,505	2,488,321	1,206,030	3,286,763	6,981,114	777,837	3,757,237	4,535,074
2007	837,144	1,603,376	2,440,520	3,185,847	1,548,771	3,975,992	8,710,610	862,358	3,770,326	4,632,684
2008	1,121,048	1,505,418	2,626,466	3,598,030	1,750,010	4,469,134	9,817,174	1,283,740	5,498,133	6,781,873
2009	1,194,017	1,831,905	3,025,922	3,214,888	1,454,880	4,128,515	8,797,483	1,117,324	4,686,966	5,804,290
2010	1,276,841	3,151,128	4,427,969	3,069,752	1,509,250	4,187,510	8,766,512	1,457,152	6,434,825	7,891,977
2011	1,651,666	3,534,107	5,185,773	3,469,482	1,681,113	4,516,942	9,667,537	1,475,050	6,717,579	8,192,629
2012	1,801,227	3,797,708	5,598,935	3,751,160	1,763,869	4,719,467	10,234,496	1,609,293	7,276,221	8,885,514
2013	1,743,128	3,849,438	5,592,561	3,813,830	1,838,644	4,915,147	10,567,621	1,520,024	6,704,807	8,224,831
2014	1,621,735	3,572,238	5,193,973	3,379,326	1,631,877	4,410,706	9,421,909	1,403,723	6,367,971	7,771,694
2015	1,714,750	3,736,905	5,451,655	3,407,215	1,675,864	4,511,813	9,594,892	1,505,022	6,812,438	8,317,460
2016	1,731,898	3,774,274	5,506,172	3,441,287	1,692,623	4,556,932	9,690,842	1,520,073	6,880,562	8,400,635
2017	1,749,218	3,812,017	5,561,235	3,475,700	1,709,549	4,602,500	9,787,749	1,535,273	6,949,368	8,484,641
2018	1,766,710	3,850,138	5,616,848	3,510,457	1,726,644	4,648,526	9,885,627	1,550,626	7,018,862	8,569,488
2019	1,784,377	3,888,639	5,673,016	3,545,561	1,743,910	4,695,010	9,984,481	1,566,132	7,089,051	8,655,183
2020	1,802,218	3,927,522	5,729,740	3,580,999	1,761,350	4,741,961	10,084,310	1,581,794	7,159,941	8,741,735
2021	1,820,241	3,966,797	5,787,038	3,616,808	1,778,963	4,789,381	10,185,152	1,597,612	7,231,540	8,829,152
2022	1,838,444	4,006,465	5,844,909	3,652,977	1,796,753	4,837,275	10,287,005	1,613,588	7,303,856	8,917,444
2023	1,856,828	4,046,529	5,903,357	3,689,506	1,814,720	4,885,647	10,389,873	1,629,724	7,376,894	9,006,618
2024	1,875,396	4,086,995	5,962,391	3,726,401	1,832,868	4,934,503	10,493,772	1,646,021	7,450,663	9,096,684
2025	1,894,150	4,127,865	6,022,015	3,763,665	1,851,196	4,983,849	10,598,710	1,662,481	7,525,170	9,187,651
2026	1,913,091	4,169,143	6,082,234	3,801,302	1,869,708	5,033,688	10,704,698	1,679,106	7,600,422	9,279,528
2027	1,932,222	4,210,835	6,143,057	3,839,315	1,888,405	5,084,024	10,811,744	1,695,897	7,676,226	9,372,323
2028	1,951,544	4,252,943	6,204,487	3,877,708	1,907,289	5,134,864	10,919,861	1,712,856	7,753,190	9,466,046
2029	1,971,061	4,295,473	6,266,534	3,916,486	1,926,363	5,186,214	11,029,063	1,729,984	7,830,722	9,560,706
2030	1,990,770	4,338,428	6,329,198	3,955,650	1,945,626	5,238,075	11,139,351	1,747,284	7,909,029	9,656,313
2031	2,010,679	4,381,811	6,392,490	3,995,207	1,965,082	5,290,456	11,250,745	1,764,577	7,988,120	9,752,877
2032	2,030,784	4,425,629	6,456,413	4,035,159	1,984,733	5,343,361	11,363,253	1,782,405	8,068,000	9,850,405
2033	2,051,093	4,469,886	6,520,979	4,075,511	2,004,581	5,396,794	11,476,886	1,800,229	8,148,681	9,948,910
2034	2,071,604	4,514,586	6,586,190	4,116,266	2,024,626	5,450,762	11,591,654	1,818,231	8,230,167	10,048,398
2035	2,092,320	4,559,731	6,652,051	4,157,429	2,044,873	5,505,270	11,707,572	1,836,413	8,312,469	10,148,882
TOTAL	66,586,388	130,734,975	197,321,363	152,110,498	78,544,668	218,966,853	449,622,019	59,150,601	248,294,660	307,445,261

TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	37,806	1,963	5,639	60,701	678,086	2,008	2,073	77,591	865,867
1969	45,479	2,235	30,158	80,554	1,197,126	2,286	2,085	90,773	1,450,696
1970	46,969	2,292	35,450	96,673	1,381,493	2,344	2,158	93,408	1,660,787
1971	47,997	2,314	35,366	106,654	1,643,163	2,366	2,288	94,874	1,935,022
1972	49,866	2,414	37,844	122,313	1,729,189	2,469	2,254	98,777	2,045,106
1973	50,006	2,385	36,180	125,553	1,719,873	2,440	2,310	98,330	2,037,077
1974	52,818	2,556	36,570	135,661	1,823,065	2,614	2,529	104,609	2,160,422
1975	66,963	3,243	44,251	162,738	2,235,242	3,317	3,191	132,663	2,651,608
1976	66,504	3,328	45,364	159,303	2,215,999	3,404	2,919	133,940	2,630,761
1977	75,595	3,812	49,192	189,661	2,522,290	3,898	3,708	152,838	3,000,994
1978	70,688	3,503	49,725	174,897	2,427,163	3,583	3,644	141,672	2,874,875
1979	68,879	3,436	48,142	173,677	2,378,315	3,514	3,492	138,493	2,817,948
1980	95,898	4,722	59,551	235,741	3,146,570	4,830	4,777	191,582	3,743,671
1981	118,448	5,965	66,183	266,353	3,440,557	6,099	5,187	239,323	4,148,115
1982	134,083	6,711	67,061	311,879	3,848,922	6,862	6,382	270,061	4,651,961
1983	184,902	9,242	80,869	426,485	5,030,031	9,450	8,494	372,182	6,121,655
1984	194,228	9,656	95,555	471,854	5,636,134	9,874	8,719	389,892	6,815,912
1985	200,694	9,957	115,227	486,162	6,042,593	10,182	8,982	402,457	7,276,254
1986	207,028	10,302	110,479	530,803	6,372,710	10,536	10,341	415,776	7,667,975
1987	205,002	10,259	109,401	533,451	6,378,437	10,493	10,517	412,889	7,670,449
1988	203,711	10,223	122,903	516,432	6,388,497	10,455	10,341	410,968	7,673,430
1989	224,049	11,269	116,197	564,169	6,747,046	11,526	11,102	452,406	8,137,764
1990	271,051	13,666	148,238	664,040	8,111,616	13,976	13,206	547,974	9,783,767
1991	275,748	13,854	144,486	662,755	8,111,610	14,168	13,218	556,474	9,792,313
1992	317,889	16,027	162,466	764,224	9,115,453	16,393	18,209	642,672	11,053,333
1993	359,879	17,989	184,477	831,662	10,372,245	18,399	19,560	724,397	12,528,608
1994	309,084	15,486	224,254	738,619	9,789,833	15,839	16,434	622,879	11,732,428
1995	395,441	19,918	220,899	898,339	11,190,121	20,373	21,551	799,070	13,565,712
1996	362,623	19,968	301,835	902,162	11,872,821	20,424	21,664	796,711	14,298,208
1997	366,476	20,154	186,450	942,987	10,558,144	20,613	19,344	806,084	12,920,252
1998	453,033	24,560	288,906	1,098,213	12,207,920	25,122	21,594	995,194	15,114,542
1999	385,900	21,263	276,543	984,711	11,152,356	21,747	21,989	848,107	13,712,616
2000	386,838	21,276	208,697	1,027,546	10,013,565	21,759	22,830	849,266	12,551,777
2001	463,341	25,491	231,867	1,210,608	11,261,888	26,070	31,728	1,017,517	14,268,510
2002	426,030	21,560	224,116	1,080,257	10,230,940	22,052	25,580	813,275	12,843,810
2003	500,840	25,508	244,922	1,191,455	11,412,691	26,091	30,978	956,231	14,388,716
2004	449,128	22,993	247,728	1,140,021	10,806,480	62,652	25,747	743,270	13,498,019
2005	427,262	21,924	258,381	1,014,428	10,332,904	59,650	24,378	708,042	12,846,969
2006	467,894	23,918	198,017	1,118,495	10,421,474	72,230	26,660	771,101	13,099,789
2007	530,455	26,893	234,926	1,275,992	11,744,067	82,920	27,474	869,675	14,792,402
2008	637,860	32,875	370,391	1,548,051	15,269,571	103,150	33,485	1,056,701	19,052,084
2009	524,272	26,671	335,196	1,281,504	12,868,217	85,216	27,627	861,433	16,010,136
2010	512,619	29,813	409,249	1,340,645	13,391,824	96,375	29,039	890,326	16,699,890
2011	589,670	34,507	398,912	1,618,590	15,290,930	109,354	39,763	1,028,480	19,110,206
2012	619,118	36,006	459,350	1,721,155	16,664,475	115,036	36,049	1,075,341	20,726,530
2013	710,243	38,130	449,989	1,731,881	17,886,919	119,751	40,852	1,137,837	22,115,602
2014	598,669	32,032	414,853	1,380,201	15,505,973	102,073	32,103	956,883	19,022,787
2015	622,126	35,260	445,811	1,523,443	16,959,617	111,908	35,779	1,052,903	20,786,847
2016	628,348	35,612	450,269	1,538,678	17,129,214	113,027	36,136	1,063,433	20,994,717
2017	634,631	35,969	454,772	1,554,064	17,300,505	114,157	36,498	1,074,067	21,204,663
2018	640,977	36,328	459,320	1,569,605	17,473,511	115,299	36,863	1,084,807	21,416,710
2019	647,387	36,692	463,913	1,585,301	17,648,245	116,452	37,231	1,095,656	21,630,877
2020	603,274	37,058	468,552	1,600,625	17,820,530	117,617	37,604	1,106,612	21,791,872
2021	609,306	37,428	473,237	1,616,632	17,998,735	118,793	37,980	1,117,678	22,009,789
2022	615,400	37,803	477,969	1,632,798	18,178,722	119,981	38,359	1,128,955	22,229,987
2023	621,554	38,181	482,749	1,649,126	18,360,510	121,181	38,743	1,140,144	22,452,188
2024	627,769	38,562	487,577	1,665,617	18,544,114	122,393	39,130	1,151,545	22,676,707
2025	634,047	38,948	492,452	1,682,273	18,729,556	123,616	39,522	1,163,061	22,903,475
2026	640,387	39,337	497,377	1,699,096	18,916,851	124,853	39,917	1,174,691	23,132,509
2027	646,791	39,731	502,351	1,716,087	19,106,020	126,101	40,316	1,186,438	23,363,835
2028	653,259	40,128	507,374	1,733,248	19,297,080	127,362	40,719	1,198,302	23,597,472
2029	659,792	40,529	512,448	1,750,580	19,490,050	128,636	41,126	1,210,285	23,833,446
2030	666,389	40,935	517,572	1,768,086	19,684,951	129,922	41,538	1,222,388	24,071,781
2031	673,053	41,344	522,748	1,785,767	19,881,801	131,221	41,953	1,234,612	24,312,499
2032	679,784	41,757	527,976	1,803,625	20,080,618	132,534	42,373	1,246,958	24,555,625
2033	686,582	42,175	533,255	1,821,661	20,281,425	133,859	42,796	1,259,428	24,801,181
2034	693,448	42,597	538,588	1,839,878	20,484,239	135,197	43,224	1,272,022	25,049,193
2035	700,382	43,023	543,974	1,858,276	20,689,082	136,549	43,657	1,284,742	25,299,685
TOTAL	27,373,662	1,543,666	18,582,739	69,494,721	764,621,894	4,016,641	1,590,019	50,458,971	937,682,313

TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	65,074	28,085	11,697	2,958	19,291	1,089	24,380	8,173	52,315	14,399
1969	86,339	70,342	15,522	3,925	25,598	1,445	32,348	10,844	69,419	19,106
1970	107,807	84,577	19,392	4,904	31,981	1,804	40,391	13,540	86,727	23,665
1971	178,820	105,979	32,228	8,150	53,151	2,992	66,999	22,459	144,136	39,636
1972	363,555	202,625	106,740	30,967	176,037	6,601	213,032	48,102	548,123	144,113
1973	404,661	222,765	121,341	34,674	200,116	7,346	243,320	53,975	724,535	190,156
1974	434,868	235,528	130,627	37,062	215,432	7,677	262,735	56,383	786,107	207,019
1975	504,791	289,501	151,031	43,176	249,082	9,082	303,108	65,580	905,424	238,842
1976	559,013	262,420	160,686	44,454	265,004	10,030	325,512	73,253	964,524	256,570
1977	675,504	335,749	184,813	47,743	304,792	11,890	381,161	87,355	1,069,446	289,793
1978	600,343	376,946	187,028	54,156	308,449	10,711	373,192	78,304	1,148,279	300,751
1979	661,123	349,072	196,264	52,211	323,677	12,124	401,469	87,126	1,125,452	302,508
1980	858,039	415,571	253,090	71,921	417,398	15,435	508,379	112,853	1,518,405	401,223
1981	1,001,503	511,087	284,970	73,534	469,970	18,046	588,024	131,992	1,548,350	420,523
1982	1,128,643	557,494	320,938	89,560	529,292	20,193	649,204	148,012	1,870,559	497,871
1983	1,744,932	832,687	450,049	119,275	742,218	30,643	922,072	225,793	2,373,149	639,682
1984	2,105,780	943,524	548,784	150,179	905,055	36,810	1,112,196	271,187	3,018,294	803,394
1985	2,157,936	1,055,744	584,697	157,841	964,282	38,972	1,191,309	277,250	3,230,403	860,780
1986	2,311,841	1,102,466	618,750	162,748	1,020,438	40,051	1,268,806	295,987	3,318,638	893,069
1987	2,366,343	1,032,918	628,222	167,262	1,036,061	41,773	1,283,836	307,844	3,400,838	913,933
1988	2,303,274	1,042,113	649,276	175,694	1,070,784	40,604	1,321,553	298,438	3,587,873	960,968
1989	2,280,051	1,088,176	613,266	169,993	1,011,401	39,501	1,240,888	292,775	3,499,964	932,519
1990	2,636,186	1,275,150	708,829	201,242	1,169,006	45,472	1,424,445	336,069	4,084,211	1,078,392
1991	2,737,441	1,454,172	763,989	210,644	1,259,974	48,936	1,546,583	358,165	4,348,900	1,150,633
1992	2,781,586	1,579,025	750,248	198,232	1,237,307	49,829	1,538,733	362,844	4,131,745	1,115,632
1993	3,109,819	1,689,775	850,589	234,719	1,402,796	56,125	1,722,415	411,539	5,023,595	1,338,111
1994	2,825,193	1,608,731	794,991	225,121	1,311,100	51,259	1,634,886	376,180	4,794,820	1,267,565
1995	3,121,440	1,720,649	848,101	231,718	1,398,686	58,749	1,766,297	444,998	4,828,432	1,272,345
1996	3,093,678	1,966,634	862,720	228,008	1,422,789	56,813	1,817,427	423,444	4,707,473	1,256,549
1997	3,250,394	1,810,292	918,428	281,067	1,514,687	59,547	1,853,224	446,127	5,705,741	1,477,757
1998	3,876,512	2,050,254	1,070,517	299,639	1,765,491	73,835	3,207,848	561,246	6,076,375	1,634,942
1999	3,844,435	2,115,519	1,117,470	312,071	1,842,926	76,123	3,256,412	551,446	6,473,569	1,743,108
2000	3,768,522	3,396,827	1,041,970	293,550	1,718,416	68,655	3,018,305	596,993	5,914,611	1,582,081
2001	4,462,558	3,773,915	1,112,040	298,270	1,833,963	80,899	3,288,631	700,359	5,761,451	1,557,034
2002	3,643,974	3,500,194	1,018,976	282,748	1,680,496	62,632	3,003,252	550,071	5,637,788	1,512,805
2003	4,120,302	3,445,050	1,138,809	302,841	1,878,111	68,962	3,337,082	616,374	6,695,594	1,629,755
2004	4,508,483	4,095,241	1,464,215	328,244	1,939,631	77,895	3,476,825	686,195	7,338,058	1,796,212
2005	3,853,314	3,567,855	5,944,452	291,124	2,262,882	67,166	2,926,205	584,463	6,840,007	1,610,368
2006	4,116,829	3,359,273	8,493,116	310,973	2,835,535	75,307	3,177,487	645,644	7,041,083	1,704,915
2007	4,496,529	4,456,118	8,706,413	330,908	2,920,496	79,069	3,352,518	685,119	8,114,326	1,906,670
2008	4,980,414	5,344,871	9,842,656	376,067	3,331,503	82,992	4,139,565	754,564	9,333,211	2,061,745
2009	4,586,041	4,521,055	8,727,268	357,555	3,010,031	78,187	3,730,115	694,040	8,935,790	2,003,400
2010	4,194,032	4,349,158	9,463,689	367,847	3,238,235	73,978	3,795,904	628,181	8,935,560	2,002,511
2011	4,917,629	4,617,643	10,884,904	416,848	3,674,152	86,309	4,329,097	765,830	9,600,997	2,207,420
2012	5,797,724	5,526,573	11,712,290	480,500	4,201,179	101,255	5,175,905	895,090	11,270,826	2,595,946
2013	5,576,855	5,228,894	11,782,558	463,275	4,195,860	97,247	5,118,934	871,335	11,542,659	2,689,117
2014	4,884,343	4,579,926	9,967,786	393,535	3,558,510	85,444	4,316,364	740,077	9,769,548	2,231,843
2015	5,351,324	5,080,319	11,240,169	445,191	4,014,709	95,267	4,953,272	825,398	10,880,530	2,525,358
2016	5,404,838	5,131,123	11,352,570	449,643	4,054,856	96,219	5,002,805	833,652	10,989,334	2,550,612
2017	5,458,886	5,182,434	11,466,096	454,139	4,095,404	97,182	5,052,833	841,989	11,099,227	2,576,118
2018	5,513,475	5,234,258	11,580,757	458,681	4,136,358	98,153	5,103,361	850,409	11,210,220	2,601,879
2019	5,568,609	5,286,601	11,696,565	463,267	4,177,722	99,135	5,154,395	858,913	11,322,322	2,627,898
2020	5,619,875	5,336,357	11,808,972	467,702	4,217,641	100,052	5,344,860	866,832	11,432,062	2,653,219
2021	5,676,073	5,389,720	11,927,062	472,379	4,259,817	101,053	5,398,308	875,501	11,546,383	2,679,751
2022	5,732,834	5,443,617	12,046,333	477,103	4,302,415	102,063	5,452,291	884,256	11,661,846	2,706,548
2023	5,790,162	5,498,054	12,166,796	481,874	4,345,439	103,084	5,506,814	893,098	11,778,464	2,733,614
2024	5,848,064	5,553,034	12,288,464	486,693	4,388,894	104,115	5,561,882	902,029	11,896,249	2,760,950
2025	5,906,545	5,608,565	12,411,349	491,560	4,432,783	105,156	5,617,501	911,050	12,015,211	2,788,560
2026	5,965,610	5,664,650	12,535,462	496,475	4,477,111	106,208	5,673,676	920,160	12,135,364	2,816,445
2027	6,025,266	5,721,297	12,660,816	501,440	4,521,882	107,270	5,730,413	929,362	12,256,718	2,844,610
2028	6,085,519	5,778,510	12,787,425	506,455	4,567,100	108,342	5,787,717	938,655	12,379,284	2,873,056
2029	6,146,374	5,836,295	12,915,299	511,519	4,612,771	109,426	5,845,594	948,042	12,503,076	2,901,786
2030	6,207,838	5,894,658	13,044,452	516,634	4,658,899	110,520	5,904,050	957,522	12,628,106	2,930,804
2031	6,269,916	5,953,604	13,174,897	521,801	4,705,488	111,625	5,963,091	967,097	12,754,389	2,960,112
2032	6,332,615	6,013,140	13,306,646	527,019	4,752,543	112,741	6,022,722	976,768	12,881,933	2,989,713
2033	6,395,942	6,073,272	13,439,712	532,289	4,800,069	113,869	6,082,949	986,536	13,010,752	3,019,610
2034	6,459,901	6,134,005	13,574,109	537,612	4,848,069	115,008	6,143,778	996,401	13,140,860	3,049,807
2035	6,524,500	6,195,344	13,709,851	542,988	4,896,550	116,158	6,205,216	1,006,365	13,272,269	3,080,305
TOTAL	246,368,639	210,187,020	377,390,237	19,761,597	#####	4,380,420	#####	36,823,653	460,691,929	110,448,331

**TABLE B-16A Minimum OMP&R Component of
Transportation Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	42,918
1963	0	0	0	0	0	0	0	0	12,626	168,358
1964	0	0	0	0	0	0	0	0	13,938	184,729
1965	0	0	0	0	0	0	0	0	28,937	378,875
1966	0	0	0	0	0	0	0	0	31,321	408,396
1967	0	0	0	0	0	0	0	0	47,718	634,505
1968	8,821	972,734	9,504	1,218,520	0	0	0	0	46,945	2,745,159
1969	11,704	1,295,607	12,610	1,654,809	0	0	0	0	52,963	4,074,937
1970	14,623	1,624,569	15,746	2,069,926	0	0	0	0	69,744	4,676,285
1971	24,302	2,716,584	26,118	3,421,554	0	0	54	54	55,532	6,185,714
1972	89,131	8,038,463	68,369	10,035,858	0	0	40	40	80,412	12,998,870
1973	117,779	9,890,316	78,313	12,289,297	0	0	1	1	54,219	15,194,233
1974	128,169	11,581,491	83,453	14,166,551	0	0	143	143	76,783	17,372,560
1975	147,899	13,584,548	101,893	16,593,957	0	0	1,069	1,069	84,547	20,517,423
1976	158,664	12,862,489	94,799	16,037,418	0	0	139	139	106,717	20,027,212
1977	178,774	16,203,699	121,966	19,892,685	0	0	892	892	98,618	24,213,491
1978	186,384	17,811,770	132,435	21,568,748	0	0	39	39	100,786	26,012,788
1979	186,688	16,414,289	126,756	20,238,759	0	0	3,235	3,235	119,352	24,675,595
1980	248,399	20,926,898	154,096	25,901,707	0	0	416	416	178,812	32,038,398
1981	259,244	23,731,024	186,592	29,224,859	0	0	3,847	3,847	185,347	35,516,365
1982	307,955	27,994,510	209,141	34,323,372	0	0	11,075	11,075	173,894	41,611,654
1983	394,524	38,953,367	326,258	47,754,649	0	0	1,928	1,928	220,926	56,802,779
1984	496,808	45,597,671	382,104	56,371,786	0	0	3,765	3,765	225,959	67,072,552
1985	531,765	50,064,444	416,652	61,532,075	0	0	2,888	2,888	340,322	73,228,724
1986	551,066	52,858,915	442,334	64,885,109	0	0	2,787	2,787	279,227	76,682,112
1987	564,352	50,737,631	411,276	62,892,289	0	0	2,388	2,388	345,116	75,240,983
1988	593,787	51,262,231	406,248	63,712,843	0	0	545	545	365,207	76,126,694
1989	576,852	52,638,942	431,020	64,815,348	0	0	1,800	1,800	422,329	78,708,338
1990	667,687	61,053,824	494,721	75,175,234	0	0	788	788	474,284	91,448,066
1991	711,803	60,874,529	470,139	75,935,908	0	0	3,654	3,654	214,683	91,098,893
1992	688,558	67,460,598	502,131	82,396,468	0	0	647	647	443,676	100,077,318
1993	828,208	68,749,547	538,751	85,955,989	0	0	3,630	3,630	599,571	107,321,034
1994	783,691	63,898,029	473,897	80,045,463	0	0	2,279	2,279	609,966	101,233,254
1995	785,191	68,079,888	523,512	85,080,006	0	0	2,906	2,906	534,971	107,378,967
1996	773,653	72,757,439	561,100	89,927,727	0	0	8,007	8,007	571,857	113,585,947
1997	917,372	75,655,465	564,455	94,454,556	0	0	7,449	7,449	428,638	114,939,130
1998	1,000,558	80,540,695	608,294	102,766,206	0	0	0	0	465,095	129,072,818
1999	1,069,968	86,588,229	639,739	109,611,015	0	0	0	0	587,326	137,123,915
2000	970,788	82,837,842	638,254	105,846,814	0	0	0	0	0	131,838,145
2001	950,319	92,982,262	709,202	117,510,903	0	0	0	0	0	146,348,886
2002	923,874	85,536,695	658,323	108,011,828	0	0	0	0	0	143,619,943
2003	1,530,707	83,743,943	631,553	109,139,083	0	0	3,393	3,393	0	140,934,900
2004	1,454,887	101,193,271	773,910	129,133,067	0	0	3,455	3,455	0	158,421,704
2005	1,593,616	74,666,478	656,082	104,864,012	0	0	3,452	3,452	0	131,621,723
2006	1,452,541	78,621,092	627,016	112,460,811	0	0	3,867	3,867	0	139,349,160
2007	1,824,592	106,651,515	878,471	144,402,744	0	0	3,691	3,691	0	174,982,651
2008	2,455,903	115,156,972	994,608	158,855,071	0	0	5,179	5,179	0	197,137,847
2009	2,249,397	101,004,943	839,797	140,737,619	0	0	1,315	1,315	0	174,376,765
2010	2,370,729	99,960,052	802,201	140,182,077	0	0	1,675	1,675	0	177,970,100
2011	2,483,689	105,061,149	829,948	149,875,615	0	0	2,684	2,684	0	192,034,444
2012	2,810,905	121,281,974	992,466	172,842,903	0	0	2,883	2,883	0	218,291,261
2013	2,881,885	117,343,651	928,405	168,720,675	0	0	1,816	1,816	0	215,223,106
2014	2,573,362	100,572,450	829,211	144,502,399	0	0	1,774	1,774	0	185,914,536
2015	2,767,916	112,537,950	922,175	161,639,578	0	0	1,791	1,791	0	205,792,223
2016	2,795,594	113,663,328	931,397	163,255,971	0	0	1,809	1,809	0	207,850,146
2017	2,823,550	114,799,961	940,711	164,888,530	0	0	1,827	1,827	0	209,928,645
2018	2,851,787	115,947,960	950,118	166,537,416	0	0	1,846	1,846	0	212,027,935
2019	2,880,304	117,107,440	959,620	168,202,791	0	0	1,864	1,864	0	214,148,212
2020	2,908,520	118,215,484	968,585	169,940,161	0	0	1,883	1,883	0	216,289,701
2021	2,937,604	119,397,640	978,270	171,639,561	0	0	1,901	1,901	0	218,452,593
2022	2,966,981	120,591,614	988,053	173,355,954	0	0	1,921	1,921	0	220,637,120
2023	2,996,650	121,797,534	997,934	175,089,517	0	0	1,940	1,940	0	222,843,493
2024	3,026,617	123,015,507	1,007,913	176,840,411	0	0	1,959	1,959	0	225,071,924
2025	3,056,883	124,245,664	1,017,992	178,608,819	0	0	1,979	1,979	0	227,322,649
2026	3,087,452	125,488,118	1,028,172	180,394,903	0	0	1,998	1,998	0	229,595,870
2027	3,118,326	126,743,000	1,038,454	182,198,854	0	0	2,018	2,018	0	231,891,831
2028	3,149,509	128,010,431	1,048,838	184,020,841	0	0	2,039	2,039	0	234,210,746
2029	3,181,004	129,290,533	1,059,327	185,861,046	0	0	2,059	2,059	0	236,552,854
2030	3,212,815	130,583,438	1,069,920	187,719,656	0	0	2,080	2,080	0	238,918,379
2031	3,244,942	131,889,275	1,080,619	189,596,856	0	0	2,100	2,100	0	241,307,567
2032	3,277,393	133,208,168	1,091,425	191,492,826	0	0	2,121	2,121	0	243,720,643
2033	3,310,166	134,540,249	1,102,340	193,407,755	0	0	2,143	2,143	0	246,157,854
2034	3,343,269	135,885,653	1,113,363	195,341,835	0	0	2,164	2,164	0	248,619,434
2035	3,376,701	137,244,508	1,124,497	197,295,252	0	0	2,186	2,186	0	251,105,628
TOTAL	106,845,556	5,314,238,179	42,823,592	7,296,364,845	0	0	143,223	143,223	8,751,583	9,197,330,607

**TABLE B-16B Minimum OMP&R Component of Transportation Charge
for Each Contractor for Off-Aqueduct Power Facilities ^a**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	10,070	0	10,070	47,473	31,446	863,937	942,856	0	0	0
1984	29,957	0	29,957	157,280	77,388	2,040,188	2,274,856	0	0	0
1985	54,709	0	54,709	458,427	582,679	2,696,450	3,737,556	0	0	0
1986	45,887	0	45,887	312,938	365,147	2,595,765	3,273,850	0	0	0
1987	90,385	0	90,385	622,029	674,111	2,306,079	3,602,219	0	0	0
1988	115,970	114,196	230,166	616,865	804,606	2,116,236	3,537,707	0	0	0
1989	64,584	138,240	202,824	407,353	396,069	1,389,347	2,192,769	0	0	0
1990	77,126	138,805	215,931	535,269	514,372	1,490,250	2,539,891	0	0	0
1991	35,178	245,181	280,359	355,578	477,883	1,065,488	1,898,949	0	165,930	165,930
1992	74,573	230,716	305,289	405,244	529,119	1,183,466	2,117,829	0	0	0
1993	89,214	247,977	337,191	841,383	256,930	1,552,562	2,650,875	0	0	0
1994	111,942	229,598	341,540	501,812	559,683	1,395,238	2,456,733	0	0	0
1995	96,842	235,605	332,447	833,227	492,578	796,524	2,122,329	0	0	0
1996	63,698	205,414	269,112	367,297	304,845	1,189,291	1,861,433	711	105	816
1997	48,518	193,255	241,773	455,751	294,951	1,220,497	1,971,199	44,788	298,986	343,774
1998	82,317	251,217	333,534	380,321	380,282	1,103,662	1,864,265	198,376	1,028,220	1,226,596
1999	58,017	195,562	253,579	559,900	446,655	1,039,572	2,046,127	147,204	791,946	939,150
2000	128,759	128,393	257,152	374,808	237,138	748,820	1,360,766	82,628	474,268	556,896
2001	81,666	157,196	238,862	396,340	233,205	673,431	1,302,976	134,574	595,294	729,868
2002	40,236	127,750	167,986	383,365	229,280	519,819	1,132,464	91,639	583,933	675,572
2003	37,618	92,735	130,353	301,657	180,804	643,729	1,126,190	78,771	477,048	555,819
2004	50,289	128,180	178,469	447,802	210,093	546,342	1,204,237	92,836	662,110	754,946
2005	53,455	149,328	202,783	452,896	265,252	772,420	1,490,568	106,901	587,036	693,937
2006	59,239	127,708	186,947	476,295	277,304	798,098	1,551,697	109,498	605,502	715,000
2007	82,724	182,954	265,678	445,250	246,862	740,211	1,432,323	103,331	759,114	862,445
2008	200,185	304,502	504,687	861,568	428,737	1,074,975	2,365,280	184,501	997,507	1,182,008
2009	167,186	237,569	404,754	708,409	418,456	1,279,442	2,406,307	209,684	853,143	1,062,827
2010	186,503	221,486	407,989	876,092	407,548	1,266,270	2,549,910	203,422	963,122	1,166,544
2011	121,189	144,926	266,114	682,880	371,226	1,192,782	2,246,887	147,056	825,727	972,783
2012	226,239	362,557	588,796	1,019,644	533,755	1,683,521	3,236,920	210,005	1,120,899	1,330,905
2013	126,133	117,866	243,999	509,158	302,274	820,580	1,632,012	302,848	714,810	1,017,658
2014	41,028	33,553	74,581	160,551	87,995	217,307	465,853	38,451	231,173	269,624
2015	24,045	20,127	44,172	103,080	51,570	127,354	282,004	22,535	135,481	158,016
2016	20,581	17,702	38,283	88,234	44,142	109,012	241,388	19,289	115,968	135,257
2017	19,752	17,065	36,817	89,723	42,364	104,620	236,707	18,512	111,296	129,808
2018	8,099	6,997	15,096	36,788	17,370	42,897	97,055	7,590	45,634	53,224
2019	8,057	6,961	15,018	36,598	17,280	42,674	96,552	7,551	45,397	52,948
2020	8,668	7,489	16,157	39,375	18,592	45,913	103,880	8,124	48,843	56,967
2021	12,622	10,905	23,527	57,335	27,072	66,854	151,261	11,829	71,120	82,949
2022	11,952	10,326	22,278	54,291	25,635	63,306	143,232	11,202	67,345	78,547
2023	8,808	7,609	16,417	40,008	18,891	46,651	105,550	8,255	49,628	57,883
2024	6,592	5,695	12,287	29,942	14,138	34,914	78,994	6,178	37,141	43,319
2025	1,088	940	2,028	4,943	2,334	5,764	13,041	1,020	6,132	7,152
2026	1,362	1,177	2,539	6,186	2,921	7,213	16,320	1,276	7,674	8,950
2027	2,038	1,760	3,798	9,256	4,370	10,792	24,418	1,910	11,481	13,391
2028	1,393	1,204	2,597	6,330	2,989	7,381	16,700	1,306	7,852	9,158
2029	1,387	1,198	2,585	6,300	2,975	7,346	16,621	1,300	7,815	9,115
2030	416	359	775	1,889	892	2,203	4,984	390	2,343	2,733
2031	415	358	773	1,885	890	2,198	4,973	389	2,338	2,727
2032	426	368	794	1,934	913	2,255	5,102	399	2,398	2,797
2033	422	365	787	1,919	906	2,237	5,062	396	2,380	2,776
2034	418	361	779	1,900	897	2,216	5,013	392	2,357	2,749
2035	426	368	794	1,937	915	2,259	5,111	400	2,403	2,803
TOTAL	2,790,402	5,061,803	7,852,205	16,574,715	11,916,728	39,758,358	68,249,801	2,617,467	13,518,900	16,136,367

(a) 2010 through 2013 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge
for Each Contractor for Off-Aqueduct Power Facilities ^a**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	159,191	0	34,366	2,964,185	13,174	9,673	3,733	3,184,322
1984	389,518	0	816,103	9,095,509	26,774	33,576	49,601	10,411,081
1985	527,952	59,322	1,053,957	11,978,046	38,810	42,297	1,253,257	14,953,641
1986	552,172	12,858	885,988	11,788,714	40,659	38,275	872,008	14,190,674
1987	450,941	24,936	1,192,388	10,448,063	39,134	37,538	911,938	13,104,938
1988	425,261	31,146	1,130,988	9,910,050	35,851	26,779	850,225	12,410,300
1989	331,852	17,226	607,908	7,400,983	22,959	24,306	754,007	9,159,241
1990	219,381	7,731	428,482	5,216,562	12,089	12,046	344,943	6,241,234
1991	13,048	3,111	570,942	146,276	0	1,354	30,685	765,416
1992	244,630	13,395	706,155	5,788,599	18,587	15,716	480,903	7,267,985
1993	471,706	25,543	1,202,455	11,405,212	37,276	36,803	1,159,908	14,338,903
1994	262,029	15,161	901,463	6,786,208	19,257	19,061	567,521	8,570,700
1995	626,214	16,830	1,486,494	12,489,555	41,275	36,377	1,051,178	15,747,923
1996	407,919	13,446	1,226,968	9,219,091	28,668	24,001	1,691,135	12,611,228
1997	423,144	(6)	794,476	7,471,645	(31)	22,025	137,304	8,848,557
1998	471,993	4,597	837,228	8,366,817	127	25,458	175,371	9,881,591
1999	360,554	19,182	874,948	7,723,883	24,159	20,065	1,749,925	10,772,716
2000	193,895	5,762	392,659	4,215,772	11,530	9,847	667,127	5,496,592
2001	200,485	6,563	113,854	2,948,087	7,528	11,821	287,409	3,575,747
2002	153,306	4,540	308,554	2,797,916	9,223	10,767	299,940	3,584,246
2003	125,188	3,901	301,142	2,626,386	10,030	7,904	287,531	3,362,082
2004	168,005	12,193	457,106	2,914,113	30,989	10,807	278,204	3,871,417
2005	315,142	14,807	358,007	5,609,958	76,490	11,047	540,681	6,926,132
2006	287,977	13,112	401,503	5,488,668	38,075	11,559	432,313	6,673,207
2007	189,684	8,758	242,253	3,662,405	24,280	10,224	365,975	4,503,579
2008	184,682	7,887	381,864	3,930,067	31,949	11,276	282,379	4,830,104
2009	181,200	8,817	63,082	4,518,839	28,827	11,595	314,621	5,126,982
2010	250,194	27,117	96,128	5,774,210	40,474	16,580	488,098	6,692,800
2011	354,563	11,460	289,045	7,793,923	39,781	11,190	337,133	8,837,094
2012	235,277	19,302	640,876	6,222,379	51,873	20,802	558,661	7,749,169
2013	159,400	8,575	440,328	3,424,773	25,004	11,277	288,965	4,358,322
2014	39,293	2,341	125,641	854,991	7,414	3,034	69,403	1,102,117
2015	23,028	1,372	73,633	501,073	4,345	1,778	40,674	645,903
2016	19,711	1,175	63,028	421,728	3,719	1,522	34,816	545,699
2017	18,917	1,127	60,489	411,627	3,570	1,461	33,413	530,604
2018	7,756	462	24,802	168,776	1,464	599	13,700	217,559
2019	7,716	460	24,673	167,902	1,456	596	13,629	216,432
2020	8,302	495	26,546	180,645	1,567	641	14,664	232,860
2021	12,088	720	38,653	263,038	2,281	933	21,352	339,065
2022	11,447	682	36,602	249,076	2,160	884	20,219	321,070
2023	8,435	503	26,973	183,549	1,592	651	14,899	236,602
2024	6,313	376	20,186	137,367	1,191	487	11,151	177,071
2025	1,042	62	3,333	22,678	197	80	1,841	29,233
2026	1,304	78	4,171	28,381	246	101	2,304	36,585
2027	1,951	116	6,240	42,463	368	151	3,447	54,736
2028	1,335	80	4,267	29,039	252	103	2,357	37,433
2029	1,328	79	4,247	28,904	251	103	2,346	37,258
2030	398	24	1,273	8,666	75	31	703	11,170
2031	397	24	1,271	8,646	75	31	702	11,146
2032	408	24	1,304	8,871	77	31	720	11,435
2033	404	24	1,293	8,802	76	31	714	11,344
2034	401	24	1,281	8,719	76	31	708	11,240
2035	408	24	1,306	8,887	77	32	721	11,455
TOTAL	9,508,885	427,544	19,788,921	203,870,723	857,349	605,357	17,817,161	252,875,941

(a) 2010 through 2013 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

TABLE B-16B Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities ^a

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	1,083,881	411,247	565,798	35,432	894,572	1,250	0	0	233,134	28,548
1984	2,499,848	1,122,640	1,427,428	102,114	2,263,172	77	0	0	502,967	693,074
1985	3,749,257	1,572,025	2,032,672	170,137	3,230,451	0	0	157,601	884,188	601,583
1986	3,159,857	1,694,487	2,097,408	173,460	3,340,188	15,873	0	301,486	739,563	1,088,901
1987	3,167,759	1,694,698	1,991,841	190,149	3,230,424	95,994	1,786	258,719	1,951,799	1,091,691
1988	2,688,113	1,776,471	1,940,156	187,156	3,194,137	30,395	846	126,639	2,000,664	839,774
1989	2,357,669	1,348,806	1,326,863	132,076	2,218,516	50,948	13,206	493,424	1,257,332	792,087
1990	2,528,625	1,335,341	1,463,452	115,746	2,413,745	110,678	0	545,342	1,192,997	1,054,762
1991	1,048,414	531,160	1,022,405	125,256	1,686,304	65,111	473,291	488,207	540,119	796,531
1992	2,760,199	1,548,472	1,124,775	55,985	1,855,065	22,891	1,130,876	367,996	362,232	853,047
1993	3,559,487	1,332,392	2,256,338	29,498	3,721,492	60,615	1,101,799	640,919	425,969	1,406,255
1994	3,963,982	1,450,328	1,345,145	74,879	2,218,411	88,549	1,371,116	678,876	871,358	1,452,741
1995	4,324,009	1,901,361	2,498,462	44,237	4,120,837	43,892	881,146	636,541	75,278	1,397,623
1996	3,572,856	1,507,542	4,652,945	77,384	7,674,388	31,691	760,763	723,670	458,246	1,201,941
1997	3,411,379	1,468,949	4,294,703	42,135	4,319,206	24,319	891,191	648,652	625,340	1,175,556
1998	3,977,988	1,599,394	7,554,910	16,624	6,174,031	30,365	508,248	657,806	166,952	827,650
1999	3,696,973	1,694,851	3,195,685	71,662	3,678,076	18,305	501,486	710,674	815,001	1,375,575
2000	2,372,130	994,396	1,420,806	40,083	1,954,947	0	374,972	257,146	617,664	508,258
2001	2,680,895	1,418,179	460,256	53,460	759,169	0	213,385	445,872	1,339,699	119,363
2002	1,668,457	1,384,832	567,521	74,145	936,215	0	140,035	529,674	2,414,011	841,746
2003	1,445,146	1,353,956	411,258	44,506	678,236	0	405,376	277,984	780,631	624,561
2004	1,813,317	1,677,090	554,874	71,974	760,283	0	465,965	368,929	2,072,770	449,963
2005	2,047,638	1,443,555	1,721,141	32,667	1,987,091	0	542,366	400,828	1,568,493	566,063
2006	2,845,985	1,617,750	5,071,235	26,843	2,093,821	0	1,417,777	442,278	1,533,665	681,916
2007	2,990,954	1,864,667	3,225,680	77,880	1,331,802	0	2,023,088	710,515	2,639,102	177,256
2008	3,547,772	3,303,503	4,059,802	74,029	2,237,582	1,845	2,200,333	1,052,126	3,410,480	629,597
2009	3,350,539	3,010,931	4,067,070	79,671	1,633,327	3,263	2,559,670	1,152,062	3,948,007	1,025,723
2010	4,321,133	2,663,067	7,385,867	31,714	2,730,993	177	3,304,241	810,142	4,668,858	1,673,291
2011	4,933,215	1,836,915	5,583,136	12,972	2,281,841	407	307,884	548,888	2,176,823	1,463,053
2012	4,563,160	3,859,121	8,998,834	263,109	3,478,686	81,687	1,110,924	888,030	6,281,627	1,425,222
2013	3,190,195	1,634,510	3,538,147	136,430	1,679,207	47,137	1,454,992	494,254	2,573,781	592,255
2014	836,378	487,067	1,131,816	20,549	456,081	15,908	667,852	147,323	839,352	235,608
2015	503,510	299,717	663,309	13,016	267,289	9,323	392,336	86,340	491,908	95,889
2016	442,895	257,660	567,775	11,653	228,793	7,980	351,166	73,904	421,061	82,078
2017	436,579	248,878	544,902	11,674	219,576	7,659	337,019	70,927	404,098	105,029
2018	179,007	102,046	223,422	4,787	90,031	3,140	138,185	29,082	165,689	43,064
2019	178,080	101,517	222,265	4,762	89,565	3,124	137,469	28,931	164,831	42,841
2020	191,595	109,222	239,133	5,123	96,362	3,361	147,903	31,127	177,341	46,092
2021	278,982	159,038	348,203	7,460	140,313	4,894	215,362	45,324	258,227	67,115
2022	264,174	150,597	329,721	7,064	132,866	4,634	203,931	42,918	244,520	63,553
2023	194,675	110,977	242,978	5,206	97,911	3,415	150,280	31,627	180,192	46,833
2024	145,694	83,055	181,843	3,896	73,276	2,556	112,469	23,670	134,855	35,050
2025	24,053	13,712	30,021	643	12,097	422	18,568	3,908	22,263	5,786
2026	30,101	17,160	37,570	805	15,139	528	23,237	4,890	27,862	7,241
2027	45,037	25,674	56,211	1,204	22,651	790	34,766	7,317	41,686	10,835
2028	30,799	17,557	38,441	824	15,490	540	23,775	5,004	28,508	7,409
2029	30,656	17,476	38,263	820	15,419	538	23,665	4,980	28,376	7,375
2030	9,191	5,240	11,472	246	4,623	161	7,095	1,493	8,508	2,211
2031	9,170	5,228	11,446	245	4,612	161	7,079	1,490	8,488	2,206
2032	9,408	5,363	11,743	252	4,732	165	7,263	1,529	8,708	2,263
2033	9,335	5,322	11,651	250	4,695	164	7,206	1,517	8,641	2,246
2034	9,247	5,271	11,541	247	4,651	162	7,138	1,502	8,559	2,225
2035	9,426	5,374	11,765	252	4,741	165	7,277	1,531	8,725	2,268
TOTAL	97,188,823	54,285,786	92,822,103	2,764,391	82,777,129	895,259	27,177,802	16,461,615	52,811,148	28,370,823

(a) 2010 through 2013 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge
for Each Contractor for Off-Aqueduct Power Facilities ^a**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				TOTAL STATE WATER PROJECT (b)
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	12,791,358	0	16,045,220	0	0	0	0	20,182,468
1984	0	39,229,567	0	47,840,887	0	0	0	0	60,556,781
1985	0	77,446,523	0	89,844,437	0	0	0	0	108,590,343
1986	0	77,581,287	0	90,192,510	0	0	0	0	107,702,921
1987	0	68,939,195	0	82,614,055	0	0	0	0	99,411,597
1988	0	79,936,309	0	92,720,660	0	0	0	0	108,898,833
1989	0	68,311,546	0	78,302,473	0	0	0	0	89,857,307
1990	0	83,964,409	277,885	95,002,982	0	0	0	0	104,000,038
1991	0	54,214,229	132,209	61,123,236	0	0	0	0	64,233,890
1992	0	72,401,054	0	82,482,592	0	0	0	0	92,173,695
1993	0	55,312,615	0	69,847,379	0	0	0	0	87,174,348
1994	0	72,838,621	0	86,354,006	0	0	0	0	97,722,979
1995	0	40,862,813	0	56,786,199	0	0	0	0	74,988,898
1996	0	36,536,259	401	57,198,086	0	0	0	0	71,940,675
1997	0	37,121,379	108,559	54,131,368	0	0	0	0	65,536,671
1998	0	30,341,609	149,170	52,004,747	0	0	0	0	65,310,733
1999	0	42,257,580	106,226	58,122,094	0	0	0	0	72,133,666
2000	0	43,977,877	123,318	52,641,597	0	0	0	0	60,213,003
2001	0	49,405,276	84,868	56,980,422	0	0	0	0	62,827,875
2002	0	45,412,974	153,549	54,123,159	0	0	0	0	59,683,427
2003	3,303	41,917,356	129,134	48,071,447	0	0	0	0	53,245,891
2004	44,648	58,676,035	170,851	67,126,699	0	0	0	0	73,135,768
2005	41,448	56,220,579	61,131	66,633,000	0	0	0	0	75,946,420
2006	265,078	60,701,335	70,268	76,767,951	0	0	0	0	85,894,802
2007	248,328	61,354,857	119,861	76,763,990	0	0	0	0	83,828,015
2008	616,986	72,144,765	300,729	93,579,549	0	0	0	0	102,461,628
2009	819,589	71,530,603	313,357	93,493,811	0	0	0	0	102,494,682
2010	1,048,807	88,263,837	322,003	117,224,130	0	0	0	0	128,041,372
2011	950,657	80,066,458	224,664	100,386,912	0	0	0	0	112,709,791
2012	1,603,091	93,323,867	316,813	126,194,170	0	0	0	0	139,099,960
2013	590,562	50,127,417	326,223	66,385,110	0	0	0	0	73,637,101
2014	170,068	12,907,347	111,302	18,026,651	0	0	0	0	19,938,826
2015	106,678	7,564,443	65,229	10,558,987	0	0	0	0	11,689,082
2016	97,312	6,474,968	55,834	9,073,079	0	0	0	0	10,033,706
2017	88,935	6,214,119	53,585	8,742,980	0	0	0	0	9,676,916
2018	36,465	2,547,930	21,971	3,584,819	0	0	0	0	3,967,753
2019	36,276	2,534,728	21,857	3,566,246	0	0	0	0	3,947,196
2020	39,029	2,727,098	23,516	3,836,902	0	0	0	0	4,246,766
2021	56,831	3,970,943	34,242	5,586,934	0	0	0	0	6,183,736
2022	53,815	3,760,173	32,424	5,290,390	0	0	0	0	5,855,517
2023	39,657	2,770,942	23,894	3,898,587	0	0	0	0	4,315,039
2024	29,679	2,073,759	17,882	2,917,684	0	0	0	0	3,229,355
2025	4,900	342,360	2,952	481,685	0	0	0	0	533,139
2026	6,132	428,449	3,695	602,809	0	0	0	0	667,203
2027	9,174	641,036	5,528	901,909	0	0	0	0	998,252
2028	6,274	438,384	3,780	616,785	0	0	0	0	682,673
2029	6,245	436,352	3,763	613,928	0	0	0	0	679,507
2030	1,872	130,827	1,128	184,067	0	0	0	0	203,729
2031	1,868	130,526	1,126	183,645	0	0	0	0	203,264
2032	1,917	133,917	1,155	188,415	0	0	0	0	208,543
2033	1,902	132,873	1,146	186,948	0	0	0	0	206,917
2034	1,884	131,619	1,135	185,181	0	0	0	0	204,962
2035	1,920	134,168	1,157	188,769	0	0	0	0	208,932
TOTAL	7,031,330	1,879,836,550	3,979,519	2,346,402,278	0	0	0	0	2,691,516,591

(a) 2010 through 2013 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

(b) Costs allocated to contractors in 1989 through 2002 are reduced by credits for Off-Aqueduct Power Facility costs allocated to the pumping of non-SWP water.

TABLE B-17 Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 1 of 5

Calendar Year	NORTH BAY AQUEDUCT						SOUTH BAY AQUEDUCT		CALIFORNIA AQUEDUCT	
	Reach 1 Barker Slough Pumping Plant		Reach 3A Cordelia Pumping Plant Solano County WA		Reach 3B Cordelia Pumping Plant Napa County FC&WCD (a)		Reach 1 South Bay and Del Valle Pumping Plants (b)		Reach 1 Banks Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	4.1511341	4.1511341	0	0
1963	0	0	0	0	0	0	4.5639383	4.5639383	0	0
1964	0	0	0	0	0	0	3.5452154	3.5452154	0	0
1965	0	0	0	0	0	0	4.1911773	4.1911773	0	0
1966	0	0	0	0	0	0	3.5074573	3.5074573	0	0
1967	0	0	0	0	0	0	3.9306767	4.1752198	0	0
1968	0	0	0	0	5.7570017	5.7570017	3.3315620	4.8750942	1.5435322	1.5435322
1969	0	0	0	0	3.1823595	3.1823595	3.6949019	4.8016170	1.1067151	1.1067151
1970	0	0	0	0	3.7584301	3.7584301	4.4261441	5.3721490	0.9465349	0.9465349
1971	0	0	0	0	4.2082507	4.2082507	3.8714396	4.7522833	0.8808437	0.8808437
1972	0	0	0	0	3.9577735	3.9577735	4.3250690	5.2281686	0.9030996	0.9030996
1973	0	0	0	0	3.8103903	3.8103903	5.2455409	6.1841801	0.9386391	0.9386391
1974	0	0	0	0	3.5878850	3.5878850	6.3321503	7.2293909	0.8972406	0.8972406
1975	0	0	0	0	2.1606725	2.1606725	3.7365711	4.8327731	1.0962020	1.0962020
1976	0	0	0	0	2.9283909	2.9283909	4.5191527	5.7132795	1.1941268	1.1941268
1977	0	0	0	0	2.7516411	2.7516411	4.7630172	6.5309088	1.7679736	1.7679736
1978	0	0	0	0	3.5949619	3.5949619	5.2086183	6.8200210	1.6114026	1.6114026
1979	0	0	0	0	2.4747752	2.4747752	4.9524184	7.0944849	2.1420665	2.1420665
1980	0	0	0	0	2.9737588	2.9737588	4.5186576	5.8810393	1.3623815	1.3623815
1981	0	0	0	0	2.6488168	2.6488168	4.3834851	6.4541818	2.0706967	2.0706967
1982	0	0	0	0	10.0222589	10.0222589	5.6383622	7.4005197	1.7621575	1.7621575
1983	0	0	0	0	1.0240490	1.0240490	0.8688401	1.7143948	0.8457546	0.8457546
1984	0	0	0	0	1.6496750	1.6496750	2.7674018	3.9388186	1.1694168	1.1694168
1985	0	0	0	0	2.5224065	2.5224065	3.6942206	5.2987621	1.6045415	1.6045415
1986	0	0	0	0	4.4049446	4.4049446	7.2799222	10.5919298	3.3120077	3.3120077
1987	0	0	0	0	3.5386715	3.5386715	6.4837861	9.2276309	2.7438448	2.7438448
1988	1.1782643	1.1782643	0	1.1782643	4.4547478	5.6330121	6.1750026	8.8623074	2.6873049	2.6873049
1989	1.2715449	1.2715449	2.5423866	3.8139316	4.2807103	5.522552	8.1617218	11.6840191	3.5222973	3.5222973
1990	2.0026083	2.0026083	4.2324041	6.2350124	5.8753602	7.8779685	11.7200790	15.8516543	4.1315753	4.1315753
1991	1.2486830	1.2486830	2.6246433	3.8733263	3.8057971	5.0544801	7.5402615	11.2354099	3.6951485	3.6951485
1992	0.7094386	0.7094386	1.4175705	2.1270091	2.3509123	3.0603509	4.0600958	6.3925272	2.3324315	2.3324315
1993	-0.3464574	-0.3464574	-0.6048649	-0.9513223	-1.0200530	-1.3665104	-1.4929934	-1.2571378	0.2358556	0.2358556
1994	1.4600287	1.4600287	2.6570107	4.1170394	4.2975560	5.7575847	7.9510779	11.2405895	3.2895116	3.2895116
1995	0.7544766	0.7544766	1.2974265	2.0519031	2.2753763	3.0298529	3.2312761	5.2610469	2.0297708	2.0297708
1996	1.6427835	1.6427835	2.7704025	4.4131859	4.7993051	6.4420886	8.0186492	11.3633990	3.3447498	3.3447498
1997	1.7801484	1.7801484	3.0246843	4.8048327	5.0575904	6.8377388	9.8521246	12.6148370	2.9627125	2.9627125
1998	-0.3253238	-0.3253238	-0.5570754	-0.8823992	-0.9104311	-1.2357549	-1.8866894	-1.7683450	0.1182544	0.1182544
1999	0.7843563	0.7843563	1.2927037	2.0770600	2.1913971	2.9757534	3.9861234	5.6355474	2.3696240	2.3696240
2000	1.5890261	1.5890261	1.7244493	3.3134753	2.6552602	4.2442863	5.5422335	7.6110875	2.0688540	2.0688540
2001	9.9654353	9.9654353	12.5760161	22.5414514	22.7284120	32.6938473	42.3147437	55.0896745	12.7749308	12.7749308
2002	5.1561098	5.1561098	5.3026984	10.4588082	8.9411156	14.0972254	18.1280636	24.2060285	6.0779649	6.0779649
2003	5.1435282	5.1435282	7.0881976	12.2317258	12.7985247	17.9430528	19.2834477	26.0081275	6.7246798	6.7246798
2004	6.1803231	6.1803231	6.4041451	12.5844682	12.5865996	18.7669227	19.8212463	27.0762490	7.2550017	7.2550017
2005	7.6711365	7.6711365	7.6765647	15.3477012	18.5603496	26.2314862	25.8645498	33.9498257	8.0852759	8.0852759
2006	6.3551978	6.3551978	5.9583320	12.3135298	17.8107276	24.1659254	22.1727427	28.7375713	6.5648286	6.5648286
2007	10.3205434	10.3205434	8.0395175	18.3606009	22.5236632	32.8442067	31.2239654	40.2685020	9.0445372	9.0445372
2008	8.5992932	8.5992932	9.4486438	18.0479369	21.0313304	29.6306236	27.2930677	39.0203893	11.7273216	11.7273216
2009	6.6512805	6.6512805	7.1731823	13.8244629	15.2395043	21.8907848	22.7479602	29.0273433	6.2793831	6.2793831
2010	7.0829044	7.0829044	8.6659126	15.7488170	18.0937705	25.1766749	25.9298623	37.1935978	11.2637354	11.2637354
2011	8.9165784	8.9165784	8.9931889	17.9097673	24.2026936	33.1192719	33.7971557	45.3951283	11.5979726	11.5979726
2012	14.5011533	14.5011533	29.9327444	44.4344277	32.5092465	47.0103999	49.3789459	61.3473076	11.9683618	11.9683618
2013	17.8307191	17.8307191	37.4528907	55.2836098	44.6889782	62.5196973	42.7005491	61.7222821	19.0217330	19.0217330
2014	21.2608123	21.2608123	53.5258889	74.7867012	34.6779564	55.9387686	47.5190812	64.8524173	17.3333361	17.3333361
2015	4.9305975	4.9305975	19.7079393	24.6385368	12.2243398	17.1549373	39.4612902	51.1749201	11.7136299	11.7136299
2016	7.1905279	7.1905279	19.7079518	26.8984797	12.2243398	19.4148678	39.4612902	51.3642686	11.9029784	11.9029784
2017	7.2615468	7.2615468	19.7079787	26.9695255	12.2243398	19.4858867	39.4612911	50.3440732	10.8827821	10.8827821
2018	9.2131002	9.2131002	19.7079787	28.9210788	24.9439725	34.1570726	39.4612911	51.8904257	12.4291346	12.4291346
2019	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.3368583	11.8755672	11.8755672
2020	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.5918909	12.1305998	12.1305998
2021	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.4682844	12.0069933	12.0069933
2022	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.8502064	12.3889153	12.3889153
2023	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.6359992	12.1747081	12.1747081
2024	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.5845068	12.1232157	12.1232157
2025	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.7120331	12.2507420	12.2507420
2026	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.0630322	11.6017411	11.6017411
2027	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.6896889	12.2283978	12.2283978
2028	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.6506740	12.1893829	12.1893829
2029	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.4983873	12.0370962	12.0370962
2030	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.4924551	12.0311640	12.0311640
2031	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	52.1249840	12.6636929	12.6636929
2032	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.3949831	11.9336920	11.9336920
2033	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.7814374	12.3201463	12.3201463
2034	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.0350188	11.5737277	11.5737277
2035	9.2338258	9.2338258	19.7079787	28.9418045	24.9439725	34.1777982	39.4612911	51.5503382	12.0917471	12.0917471

(a) For the period 1968 through 1987, rates are for an interim facility.

(b) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedure.

TABLE B-17 Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 2 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Reach 4 Dos Amigos Pumping Plant		Reach 14A Buena Vista Pumping Plant		Reach 15A Teerink Pumping Plant		Reach 16A Chrisman Pumping Plant		Reach 17E Edmonston Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	1.0732031	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0.7028165	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0.7813430	1.7278778	0.3333333	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0.4125312	1.2933749	1.1407617	2.4341366	0.7218469	3.1559834	0	3.1559834	0	3.1559834
1972	0.5662758	1.4693754	0.8894941	2.3588694	0.8040021	3.1628715	1.8113853	4.9742569	7.3206022	12.2948591
1973	0.5996892	1.5383283	0.8469026	2.3852309	1.0302066	3.4154375	1.8458304	5.2612679	7.4512435	12.7125113
1974	0.5736894	1.4709300	0.8122890	2.2832190	0.9665911	3.2498101	1.7739395	5.0237496	6.9004732	11.9242227
1975	0.4606980	1.5569000	0.7554447	2.3123448	0.8894108	3.2017555	1.8682537	5.0700092	6.9962702	12.0662794
1976	0.5163828	1.7105095	0.9081491	2.6186596	0.9640628	3.5827214	2.1499640	5.7326854	7.9384515	13.6711369
1977	0.6138931	2.3818668	0.9835371	3.3654038	1.2303967	4.5958005	2.7357728	7.3315733	9.9990004	17.3305737
1978	0.4545898	2.0659925	0.9044582	2.9704506	0.9762058	3.9466564	1.8872449	5.8339014	7.0810192	12.9149206
1979	0.6587934	2.8008600	1.0519199	3.8527798	1.1976258	5.0504056	2.6012890	7.6516946	9.6345625	17.2862522
1980	0.8021465	2.1645280	1.3516057	3.5161337	1.5041463	5.0202800	3.1923433	8.2126233	10.9860288	19.1986521
1981	1.0923907	3.1630874	1.2409168	4.4040042	1.3219771	5.7259813	2.9592932	8.6852745	9.9649551	18.6502296
1982	0.6326785	2.5948359	1.2041660	3.7990019	1.3723736	5.1713756	2.8986491	6.0702427	10.2096358	18.2796806
1983	0.3647859	1.2105406	0.7590265	1.9685670	0.8857383	2.8553063	1.7823405	4.6176458	5.5088367	10.1262825
1984	0.6581523	1.8275691	1.0533611	2.8809302	1.2188270	4.0997572	2.5407768	6.6405340	8.2344665	14.8750006
1985	0.8726163	2.4771579	1.4204831	3.8976409	1.6516291	5.5492701	3.4695783	9.0188484	11.8181234	20.8369718
1986	1.3996542	4.7116618	2.3713282	7.0829901	2.7567970	9.8397871	5.9534613	15.7932484	20.6010240	36.3942724
1987	1.2912643	4.0351091	2.2344385	6.2695476	2.5459999	8.8155474	5.3141190	14.1296664	17.7628277	31.8924941
1988	1.1947837	3.8820886	2.1129991	5.9950877	2.4017135	8.3968012	5.0055748	13.4023759	16.6001692	30.0025452
1989	1.4935226	5.0158199	2.6947446	7.7105645	3.0084211	10.7189856	6.5499538	17.2689394	22.1795336	39.4484730
1990	1.8962463	6.0278216	3.3080372	9.3358588	3.7483036	13.0841624	8.6832678	21.7674302	31.0405219	52.8079521
1991	1.0437991	4.7389476	2.1132495	6.8521971	2.4154810	9.2676780	5.6823745	14.9500525	20.4744695	35.4245220
1992	0.9002103	3.2326417	1.4836761	4.7163178	1.7077297	6.4240475	3.5445788	9.9686263	12.0459599	22.0145862
1993	0.1605206	0.3963762	-0.1405164	0.2558598	-0.1312944	0.1245654	-0.7754796	-0.6509143	-3.5828989	-4.2338132
1994	1.4208578	4.7103693	2.5100856	7.2204549	2.8029168	10.0233717	6.0772944	16.1006661	21.5000984	37.6007645
1995	0.7974861	2.8272569	1.3474564	4.1747133	1.9445529	5.6692662	3.1250716	8.7943378	10.9461772	19.5450149
1996	1.6726383	5.0173881	2.5952092	7.6125973	2.8425227	10.4551200	6.3087407	16.7638607	22.6420778	39.4059385
1997	1.2769880	4.2397005	2.5012144	6.7409148	2.6893394	9.4302542	6.2890095	15.7192637	23.0714697	38.7907334
1998	-0.2195574	-0.1013030	-0.4232465	-0.5245494	-0.4504610	-0.9750105	-1.0585256	-2.0335361	-3.8077856	-5.8413217
1999	0.8412976	3.2109216	1.4071463	4.6180679	1.2831855	5.9012534	3.4289262	9.3001795	13.6776471	23.0078267
2000	0.8112217	2.8800756	1.4247318	4.3048074	1.5660515	5.8708589	3.6917976	9.5626565	13.5169032	23.0795597
2001	6.0648646	18.8397954	11.1782651	30.0180605	12.2564824	42.2745429	28.3288417	70.6033847	106.0328491	176.6362338
2002	2.6241510	8.7021160	4.6014508	13.3035668	5.0195661	18.3231329	11.6145173	29.9376502	43.1568537	73.0945038
2003	3.1183220	9.8430017	5.5840419	15.4270436	6.0833443	21.5103879	14.1493695	35.6597574	52.6066771	88.2666246
2004	3.3220914	10.5770931	5.8515717	16.4286648	6.3561368	22.7848016	14.8070070	37.5918086	55.0480248	92.6398334
2005	3.8183053	11.9035812	6.8527860	18.563672	7.4284805	26.1848477	17.2725190	43.4573667	62.2202022	105.6775689
2006	2.9928569	5.5791678	5.5791678	15.368534	6.0054729	21.1423262	14.0392053	35.1815316	47.8414815	83.0230131
2007	4.4344346	13.4789718	7.9584996	21.4374714	8.6171802	30.0546516	19.9802589	50.0349105	69.4509782	119.4858887
2008	4.4814232	16.2087447	8.4372632	24.6460079	9.8493744	34.4953824	20.4427600	54.9381424	72.1849514	127.1230938
2009	3.3389793	9.6183624	6.1048916	15.7232541	6.7503066	22.4735606	14.9228794	37.3964400	57.8317802	95.2282202
2010	4.2226833	15.4864187	6.9955548	22.4859736	7.5924014	30.0783750	17.3749295	47.4533045	64.2995235	111.7528280
2011	4.8974635	16.4954361	8.3808013	24.8762374	9.0269451	33.9031825	20.7671568	54.6703394	70.4839246	125.1542639
2012	5.2670272	17.2353890	9.2008378	26.4362288	11.3144803	37.7507071	24.4187204	62.1694275	85.2373929	147.4068204
2013	6.1411677	25.1629006	10.8345511	35.9974517	13.1275449	49.1249967	28.3299205	77.4549171	98.9281293	176.3830464
2014	7.2737254	24.6070615	13.1445096	37.7515711	16.0248722	53.7764433	34.6767888	88.4532321	121.4519676	209.9051996
2015	6.0614883	17.7751182	10.3425941	28.1177123	10.5964913	38.7142036	25.3234963	64.0376999	95.7159754	159.7536753
2016	6.4819872	18.3849656	11.3079196	29.6928852	11.6456192	41.3385044	27.8856008	69.2241052	105.5694012	174.7935064
2017	6.2854271	17.1852091	10.8760445	28.0442536	11.1772841	39.2215377	26.7446872	65.9662250	101.1866645	167.1528895
2018	7.1304345	19.5595091	12.8814753	32.4410443	13.3625398	45.8035842	32.0856963	77.8892805	121.7427427	199.6320231
2019	6.6680489	18.5436162	11.6914599	30.2350761	12.0625926	42.2976686	28.9069521	71.2046259	109.5010312	180.7056570
2020	6.9695639	19.1001637	12.4473769	31.5475405	12.8854423	43.9298292	30.9175252	75.3505080	117.2368173	192.5873253
2021	6.7809362	18.7879295	12.0078833	30.7958127	12.4070661	43.2028788	29.7482092	72.9510881	112.7374095	185.6884976
2022	6.9607520	19.3496673	12.4692307	31.8188990	12.9093681	44.7282662	30.9759811	75.7042473	117.4620857	193.1663329
2023	7.0299751	19.2046832	12.6519128	31.8565960	13.1088819	44.9654779	31.4639512	76.4294291	119.3412824	195.7077116
2024	6.8117883	18.9350040	12.1033453	31.0383493	12.5108960	43.5492453	30.0019608	73.5512061	113.7136018	187.2648078
2025	6.9803930	19.2311350	12.5313901	31.7625251	12.9774083	44.7399334	31.1424044	75.8823377	118.1032907	193.9856285
2026	6.6226122	18.2243533	11.6376528	29.8620061	12.0043621	41.8663682	28.7641817	70.6305499	108.9517689	179.5823181
2027	6.9950341	19.2234319	12.5757662	31.7991981	13.0259099	44.8251080	31.2611105	76.0862185	118.5605736	194.6467921
2028	6.9952131	19.1845960	12.5739798	31.7585758	13.0226468	44.7812226	31.2526808	76.0339035	118.5252427	194.5591462
2029	6.8945899	18.9316861	12.3343397	31.2660259	12.7628100	44.0288359	30.6176951	74.6465310	116.0384227	190.7303737
2030	6.7863633	18.8175273	12.0591135	30.8766408	12.4625795	43.3392203	29.8883843	73.2231046	113.2589775	186.4820822
2031	7.2383328	19.9020257	13.2503106	33.1523362	13.7664163	46.9187525	33.0747958	79.9935482	125.5554286	205.5489769
2032	6.6403719	18.5740639	11.7104995	30.2845634	12.0829768	42.3675401	28.9572557	71.3247958	109.6945345	181.0193303
2033	7.1926079	19.5127542	13.1389152	32.6516695	13.6445368	46.2962063	32.7763262	79.0725326	124.6051822	203.4777148
2034	6.4410253	18.0147530	11.2334190	29.2481721	11.5653243	40.8134963	27.6927564	68.5062527	104.8326677	173.3388904
2035	7.3039537	19.3957007	13.5377855	32.9334863	14.0958173	47.0293035	33.8898943	80.9191978	128.7346875	209.6538853

TABLE B-17 Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 3 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 18A Alamo Powerplant		Reach 22B Pearblossom Pumping Plant		Reach 23 Mojave Siphon Powerplant		Reach 26A Devil Canyon Powerplant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0	3.1559834	0	3.1559834	0	3.1559834	0	3.1559834
1972	0	12.2948591	1.9331104	14.2279695	0	14.2279695	-2.3717647	11.8562048
1973	0	12.7125113	3.8751940	16.5877053	0	16.5877053	-8.9027252	7.6849801
1974	0	11.9242227	3.1602116	15.0844343	0	15.0844343	-5.3440968	9.7403376
1975	0	12.0662794	3.0210558	15.0873353	0	15.0873353	-5.7803309	9.3070043
1976	0	13.6711369	3.7579009	17.4290378	0	17.4290378	-6.6439666	10.7850713
1977	0	17.3305737	3.0796474	20.4102211	0	20.4102211	-12.0911833	8.3190378
1978	0	12.9149206	4.0233030	16.9382236	0	16.9382236	-8.2569506	8.6812730
1979	0	17.2862572	5.0776468	22.3639040	0	22.3639040	-9.7140035	12.6499005
1980	0	19.1986521	4.3918283	23.5904804	0	23.5904804	-8.3797007	15.2107797
1981	0	18.6502296	3.9973528	22.6475824	0	22.6475824	-6.7528590	15.8947235
1982	0	18.2796606	3.6829998	21.9626604	0	21.9626604	-6.9238898	15.0387706
1983	0	10.1282825	1.7205305	11.8468130	0	11.8468130	-23.7323457	-11.9455328
1984	0	14.8750006	2.4763871	17.3513877	0	17.3513877	-29.2940447	-11.9426570
1985	0	20.8369718	3.4967556	24.3337274	0	24.3337274	-30.7672356	-6.4335082
1986	-2.3583180	34.0359544	5.9864597	40.0224141	0	40.0224141	-29.2499580	10.7724561
1987	-2.5482255	29.3442686	5.0535029	34.3977115	0	34.3977115	-29.7006534	4.6971181
1988	-1.3847067	28.6178385	4.7392460	33.3570844	0	33.3570844	-29.0334518	4.3236326
1989	-1.1019487	38.3465243	6.4066114	44.7531357	0	44.7531357	-28.3706997	16.3824360
1990	-1.0673268	51.7406253	8.9787944	60.7194197	0	60.7194197	-28.8797266	31.8396931
1991	-1.5206590	33.9038630	6.0785417	39.9824047	0	39.9824047	-30.3294563	9.6529484
1992	-2.6080003	19.4065859	3.6219501	23.0285360	0	23.0285360	-29.7388993	-6.7653633
1993	-0.1885524	-4.4223656	-1.0192774	-5.4416430	0	-5.4416430	-30.6629489	-36.1045919
1994	-0.1279266	37.4728379	6.4513573	43.9241952	0	43.9241952	-30.4781656	13.4460296
1995	-3.4425314	16.0979836	3.3643070	19.4622905	0	19.4622905	-30.3517624	-10.8894719
1996	-5.9839345	33.4220040	6.6794995	40.1015035	-2.3423415	37.7591620	-29.5900574	8.1691046
1997	-4.7847600	34.0059734	6.8397922	40.8457656	-3.8632009	36.9825646	-30.6066647	6.3758999
1998	-5.0614104	-10.9027321	-1.3239652	-12.2266973	-3.7700558	-15.9967531	-30.4293072	-46.4260603
1999	-4.8990186	18.1088081	3.7378677	21.8466757	-5.1563836	16.6902921	-30.2385322	-15.5482400
2000	-5.3488706	17.7306892	4.0004045	21.7310937	-5.1804371	16.5506566	-30.2852311	-13.7345744
2001	-4.6452108	171.9910230	29.7226978	201.7137208	-5.7699537	195.9437671	-30.9018397	165.0419274
2002	-5.4660286	67.6284752	12.9716035	80.600788	-6.4072101	74.1928686	-30.1661590	44.0267096
2003	-3.3142156	84.9524089	15.4215861	100.3739950	-7.1779336	93.1960614	-30.3892807	62.8068007
2004	-5.5767140	87.0631195	16.1802355	103.2433550	-7.4282488	95.8141062	-30.2389380	65.5751682
2005	-5.5017080	100.1758609	17.8811480	118.0570089	-6.6110924	111.4459165	-30.2939296	81.1519869
2006	-3.1387155	79.8842976	13.8127394	93.6970370	-5.4976224	88.1994445	-30.8005787	58.3988358
2007	-2.7809944	116.7048943	20.2745744	136.9794687	-6.1785168	130.8009519	-30.0961198	100.7048322
2008	-5.4028716	121.7202222	20.3472811	142.0675033	-6.0198040	136.0476993	-30.7631237	105.2845756
2009	-6.3446583	88.8835620	19.4235986	108.3071606	-5.4878080	102.8193526	-33.3163093	69.5030433
2010	-5.1259757	106.6268523	18.6766392	125.3034915	-6.4398404	118.8636511	-28.6783430	90.1853081
2011	-5.2115716	119.9426923	20.7466336	140.6893258	-7.1290888	133.5602370	-29.9982569	103.5619801
2012	-3.6689208	143.7378996	27.4811072	171.2190068	-14.0907297	157.1282771	-25.6971338	131.4311433
2013	-7.6863600	168.6966864	34.1099908	202.8066773	-15.6756547	187.1310225	-29.8515393	157.2794833
2014	-7.8495431	202.0556566	37.5057312	239.5613877	-16.0266524	223.5347353	-30.0734417	193.4612936
2015	-7.7680059	151.9856694	30.7003566	182.6860260	-11.7848454	170.9011806	-29.0813224	141.8198582
2016	-8.3786949	166.4148115	33.2003335	199.6151450	-14.0885763	185.5265687	-30.7776797	154.7488891
2017	-7.9896517	159.1632378	31.0394171	190.2026549	-12.1401619	178.0624930	-29.5258124	148.5366806
2018	-8.9371745	190.6948487	35.3979001	226.0927488	-13.6541281	212.4386207	-30.7880740	181.6505467
2019	-7.9660772	172.7195799	30.9426067	203.6621866	-12.3293715	191.3328151	-29.3931911	161.9396240
2020	-8.4255665	184.1617588	33.0080469	217.1698057	-13.1921678	203.9776379	-30.5792195	170.5984183
2021	-8.3212868	177.3672108	32.6586602	210.0240709	-13.2496608	196.7744101	-29.7959089	166.9785012
2022	-8.3334444	184.8328885	32.5511559	217.3840444	-13.3970044	203.9870400	-29.5732336	174.4138063
2023	-8.7137947	187.0569169	34.4712844	221.5282012	-13.3323796	208.1958217	-30.2808303	177.9149914
2024	-8.1117103	179.1530976	31.6556980	210.8087956	-12.3552667	198.4535289	-30.3589264	168.0946025
2025	-8.5377479	185.4478806	33.5374712	218.9853518	-13.0388401	205.9465118	-30.0416285	175.9048833
2026	-8.1334791	171.4488397	31.7870960	203.2359357	-12.7503031	190.4856326	-29.7985721	160.6870605
2027	-8.3873197	186.2594723	32.6926160	218.9520883	-13.2752758	205.6768125	-30.0587684	175.6180442
2028	-8.4786342	186.0805120	33.3680431	219.4485551	-13.6872604	205.7612947	-30.5560486	175.2052460
2029	-8.3499004	182.3804732	32.7055656	215.0860389	-12.6852727	202.4007662	-29.8416133	172.5591529
2030	-8.1566317	178.3254504	31.8913305	210.2167809	-12.6240345	197.5927464	-29.4726092	168.1201373
2031	-8.7218719	196.8271050	34.3963945	231.2234995	-13.7888279	217.4346716	-30.3617421	187.0729295
2032	-7.9136078	173.1057225	30.5485505	203.6542730	-11.9765974	191.6776756	-29.1593960	162.5182796
2033	-8.7995533	194.6781615	34.6499125	229.3280740	-13.7853220	215.5427520	-31.0407852	184.5019668
2034	-8.1691719	165.1697186	32.0657843	197.2355029	-12.4525404	184.7829624	-29.1698310	155.6131314
2035	-8.3940235	201.2598618	32.7151063	233.9749681	-13.6217859	220.3531822	-29.9040563	190.4491259

TABLE B-17 Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 4 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 2B (EBX) Greenspot Pumping Plant		Reach 3A (EBX) Crafton Hills Pumping Plant		Reach 4B (EBX) Cherry Valley Pumping Plant		Reach 29A Oso Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0	3.1559834	0	3.1559834	0	3.1559834	0	3.1559834
1972	0	11.8562048	0	11.8562048	0	11.8562048	1.1017349	13.3965941
1973	0	7.6849801	0	7.6849801	0	7.6849801	0.7905574	13.5030687
1974	0	9.7403376	0	9.7403376	0	9.7403376	0.7530214	12.6772442
1975	0	9.3070043	0	9.3070043	0	9.3070043	0.8405850	12.9068644
1976	0	10.7850713	0	10.7850713	0	10.7850713	0.7771828	14.4483197
1977	0	8.3190378	0	8.3190378	0	8.3190378	0.6152458	17.9458194
1978	0	8.6812730	0	8.6812730	0	8.6812730	0.5222831	13.4372037
1979	0	12.6499005	0	12.6499005	0	12.6499005	0.7045701	17.9908273
1980	0	15.2107797	0	15.2107797	0	15.2107797	1.4269064	20.6255585
1981	0	15.8947235	0	15.8947235	0	15.8947235	1.5684309	20.2186605
1982	0	15.0387706	0	15.0387706	0	15.0387706	1.4942585	19.7739190
1983	0	-11.9455328	0	-11.9455328	0	-11.9455328	1.2818887	11.4081712
1984	0	-11.9426570	0	-11.9426570	0	-11.9426570	1.7796296	16.6546302
1985	0	-6.4335082	0	-6.4335082	0	-6.4335082	2.1683838	23.0053556
1986	0	10.7724561	0	10.7724561	0	10.7724561	3.2288411	39.6231134
1987	0	4.6971181	0	4.6971181	0	4.6971181	3.1272967	35.0197908
1988	0	4.3236326	0	4.3236326	0	4.3236326	2.9878581	32.9904032
1989	0	16.3824360	0	16.3824360	0	16.3824360	3.5262089	42.9746819
1990	0	31.8396931	0	31.8396931	0	31.8396931	3.6810660	56.4890182
1991	0	9.6529484	0	9.6529484	0	9.6529484	2.1853025	37.6098245
1992	0	-6.7653633	0	-6.7653633	0	-6.7653633	1.9048343	23.9194204
1993	0	-36.1045919	0	-36.1045919	0	-36.1045919	0.1569728	-4.0768404
1994	0	13.4460296	0	13.4460296	0	13.4460296	3.0638504	40.6646149
1995	0	-10.8894719	0	-10.8894719	0	-10.8894719	1.5724835	21.1129984
1996	0	8.1691046	0	8.1691046	0	8.1691046	3.1318961	42.5378346
1997	0	6.3758999	0	6.3758999	0	6.3758999	2.7928728	41.5836062
1998	0	-46.4260603	0	-46.4260603	0	-46.4260603	-0.3226129	-6.1639346
1999	0	-13.5482400	0	-13.5482400	0	-13.5482400	1.8332567	24.8410833
2000	0	-13.7345744	0	-13.7345744	0	-13.7345744	1.5867235	24.6662833
2001	0	165.0419274	0	165.0419274	0	165.0419274	13.3890508	190.0252846
2002	0	44.0267096	0	44.0267096	0	44.0267096	4.8843428	77.9788467
2003	0	62.8068007	0	62.8068007	0	62.8068007	6.1226755	94.3893000
2004	20.6296577	86.2049259	21.3995735	107.6043994	8.6460880	116.2504874	6.4523495	99.0921829
2005	18.9235296	100.0755165	18.0116428	118.0871593	3.7205636	121.8077229	7.3202651	112.9978340
2006	17.9479987	76.3468346	22.1837754	98.5306099	23.2659851	121.7965951	5.3832943	88.4063074
2007	22.2063330	122.9111652	29.3971432	152.3083083	81.6380791	233.9463874	8.2433208	127.7292095
2008	18.9006656	124.1852412	25.3601967	149.5454379	10.4485797	159.9940176	8.9486129	136.0717067
2009	16.6806601	86.1837034	21.8824497	108.0661531	5.0172814	113.0834345	6.2709482	101.4991684
2010	17.8868850	108.0721931	24.3947311	132.4669242	3.9425242	136.4094484	7.8965238	119.6493517
2011	18.8918717	122.4538518	25.3569558	147.8108076	3.8867955	151.6976031	8.4039291	133.5581930
2012	43.5250000	174.9561433	54.2917273	229.2478706	10.5904546	239.8383251	9.6952864	157.1021069
2013	28.5902698	185.8697530	35.6803468	221.5500999	0	221.5500999	10.6918631	187.40749095
2014	42.8009592	236.2622528	53.4152278	289.6774806	11.0073142	300.6847948	15.6650729	225.5702725
2015	39.5521205	181.3719787	49.3607143	230.7326930	0	230.7326930	10.4164777	170.1701530
2016	39.5520877	194.3009767	49.3606472	243.6616239	0	243.6616239	12.2208246	187.0143309
2017	39.5520879	188.0887688	49.3606593	237.4494278	0	237.4494278	12.1581702	179.3110587
2018	39.5520879	221.2026346	49.3606593	270.5632939	0	270.5632939	16.4409636	216.0729867
2019	39.5520879	201.4917119	49.3606593	250.8523712	0	250.8523712	15.0997461	195.8054032
2020	39.5520879	212.9505063	49.3606593	262.3111656	0	262.3111656	16.4341988	209.0215241
2021	39.5520879	206.5305891	49.3606593	255.8912485	0	255.8912485	15.0098001	200.6982977
2022	39.5520879	213.9658942	49.3606593	263.3265536	0	263.3265536	16.8654958	210.0318287
2023	39.5520879	217.4670793	49.3606593	266.8277386	0	266.8277386	16.1358471	211.9065587
2024	39.5520879	207.6468904	49.3606593	257.0073498	0	257.0073498	16.2843264	203.5491343
2025	39.5520879	215.4569712	49.3606593	264.8176305	0	264.8176305	16.3720877	210.3577162
2026	39.5520879	200.2391484	49.3606593	249.5998077	0	249.5998077	14.2839123	193.8662312
2027	39.5520879	215.1701321	49.3606593	264.5307914	0	264.5307914	17.2473661	211.8941582
2028	39.5520879	214.7573339	49.3606593	264.1179933	0	264.1179933	16.6344482	211.1935944
2029	39.5520879	212.1112408	49.3606593	261.4719001	0	261.4719001	16.3077360	207.0381096
2030	39.5520879	207.6722522	49.3606593	257.0328845	0	257.0328845	15.7621152	202.2441974
2031	39.5520879	226.6250174	49.3606593	275.9856768	0	275.9856768	19.0657181	224.6146950
2032	39.5520879	202.0703675	49.3606593	251.4310268	0	251.4310268	15.3658331	196.3851635
2033	39.5520879	224.0540547	49.3606593	273.4147141	0	273.4147141	18.2666198	221.7443345
2034	39.5520879	195.1652193	49.3606593	244.5258786	0	244.5258786	12.5641198	185.9030103
2035	39.5520879	230.0012139	49.3606593	279.3618732	0	279.3618732	24.9957714	234.6496567

TABLE B-17 Unit Variable OMP&R Component of Transportation Charge

(in dollars per acre-foot)

Sheet 5 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 29G Warne Powerplant		Reach 29J Castaic Powerplant		Reach 31A Las Perillas & Badger Hill Pumping Plants		Reach 33A Devil's Den, Bluestone, and Polonio Pass Pumping Plants	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2,616,735.3	0	2,616,735.3	1,501,486.6	4,118,221.9	0	4,118,221.9
1969	0	1,809,531.6	0	1,809,531.6	1,262,406.6	3,071,938.1	0	3,071,938.1
1970	0	2,061,211.1	0	2,061,211.1	1,630,969.9	3,358,847.7	0	3,358,847.7
1971	0	3,155,983.4	0	3,155,983.4	1,498,553.7	2,791,928.6	0	2,791,928.6
1972	0	13,396,594.1	-2,935,083.0	10,461,511.1	1,951,772.0	3,421,147.4	0	3,421,147.4
1973	0	13,503,068.7	-6,809,944.8	6,693,123.9	1,537,453.1	3,075,781.4	0	3,075,781.4
1974	0	12,677,244.2	-7,401,327.4	5,275,916.8	1,516,898.2	2,987,828.2	0	2,987,828.2
1975	0	12,906,864.4	-6,560,492.1	6,346,372.3	1,113,030.4	2,669,930.5	0	2,669,930.5
1976	0	14,448,319.7	-6,721,332.4	7,726,987.3	1,568,544.7	3,279,054.3	0	3,279,054.3
1977	0	17,945,819.4	-30,498,599.4	-12,552,780.0	1,757,337.5	4,139,204.3	0	4,139,204.3
1978	0	13,437,203.7	-9,013,018.7	4,424,185.0	1,942,950.6	4,008,943.1	0	4,008,943.1
1979	0	17,990,827.3	-19,047,809.7	-1,056,982.4	1,560,034.1	4,360,894.1	0	4,360,894.1
1980	0	20,625,558.5	-20,543,858.6	0.0816999	1,512,475.4	3,677,003.4	0	3,677,003.4
1981	0	20,218,660.5	-10,005,937.9	10,212,722.5	1,541,419.9	4,704,507.3	0	4,704,507.3
1982	-2,171,443.0	17,602,476.0	-9,598,731.4	8,003,744.6	1,758,164.9	4,353,000.8	0	4,353,000.8
1983	-8,913,075.2	2,495,086.0	-39,819,312.0	-37,324,216.0	0,178,276.6	1,388,817.1	0	1,388,817.1
1984	-15,024,601.2	1,630,029.0	-17,312,696.4	-15,682,667.4	0,854,671.2	2,682,240.3	0	2,682,240.3
1985	-14,711,535.9	8,293,819.7	-38,945,062.9	-30,651,243.2	1,201,435.1	3,678,592.9	0	3,678,592.9
1986	-14,189,365.3	25,433,748.1	-28,159,622.4	-2,725,874.2	2,263,588.6	6,975,250.5	0	6,975,250.5
1987	-14,869,165.5	20,150,174.3	-27,053,648.4	-6,903,474.1	1,913,507.2	5,948,616.2	0	5,948,616.2
1988	-14,703,284.3	18,287,118.9	-25,685,702.4	-7,398,583.5	1,773,338.6	5,655,427.2	0	5,655,427.2
1989	-14,423,150.3	28,551,531.6	-25,399,613.0	-3,152,918.6	2,415,904.0	7,431,723.9	0	7,431,723.9
1990	-14,185,038.3	42,303,979.8	-26,077,614.2	16,226,365.7	3,796,215.0	9,824,036.7	0	9,824,036.7
1991	-14,711,870.4	22,897,954.1	-25,023,463.3	-2,125,509.2	2,413,101.6	7,152,049.2	0	7,152,049.2
1992	-14,619,943.0	9,299,477.4	-25,195,135.7	-15,895,658.3	1,276,637.2	4,509,278.9	0	4,509,278.9
1993	-10,338,660.7	-14,415,501.1	-21,121,897.3	-35,537,398.4	-1,172,617.2	-0,776,241.1	0	-0,776,241.1
1994	-14,769,678.8	25,894,936.1	-26,743,730.4	-0,848,794.3	2,364,510.4	7,074,879.8	0	7,074,879.8
1995	-12,270,597.4	8,842,401.0	-25,690,799.3	-16,848,398.3	2,575,040.2	5,402,297.1	0	5,402,297.1
1996	-14,851,576.2	27,686,258.4	-29,563,918.8	-1,877,660.4	2,583,704.1	7,601,092.2	0	7,601,092.2
1997	-14,927,208.3	26,656,399.9	-27,154,185.8	-0,497,785.9	2,702,964.8	6,942,665.3	24,457,249.9	31,399,915.2
1998	-8,669,834.3	-14,833,518.0	-22,230,349.1	-37,063,867.1	-0,507,230.4	-0,608,533.3	-4,182,890.6	-4,791,423.9
1999	-14,934,026.3	9,907,057.0	-27,044,381.8	-17,137,324.8	1,334,348.9	4,545,270.5	9,575,790.6	14,121,061.1
2000	-14,165,726.1	10,500,571.1	-26,967,009.6	-16,466,452.5	1,674,422.5	4,554,498.1	12,435,685.9	16,990,184.0
2001	-16,734,930.4	173,290,354.3	-29,291,415.9	143,998,938.3	12,214,445.8	31,054,241.2	92,393,382.4	123,448,069.6
2002	-13,200,454.3	64,778,392.3	-23,778,080.8	41,000,311.5	5,452,357.0	14,154,473.0	42,235,645.3	56,390,118.3
2003	-13,975,717.2	80,411,358.2	-23,849,631.7	56,563,851.1	6,298,354.5	16,141,356.3	48,534,032.7	64,875,388.9
2004	-14,157,475.8	84,934,707.1	-25,296,749.9	59,637,957.2	6,441,129.0	17,018,222.1	52,395,477.7	69,411,369.8
2005	-14,293,879.6	98,703,954.4	-24,747,245.7	73,956,708.8	8,171,437.1	20,075,018.3	61,909,200.6	81,984,218.9
2006	-14,086,503.7	74,319,803.7	-23,886,127.3	50,433,676.4	7,111,596.3	16,669,281.9	50,214,851.9	66,884,133.8
2007	-12,516,901.6	115,212,303.4	-25,060,388.9	90,151,914.6	9,770,983.7	23,249,954.4	72,300,200.0	95,599,974.5
2008	-13,880,944.6	122,190,762.1	-29,019,814.0	93,170,948.1	9,970,677.2	26,179,421.9	75,638,483.6	101,817,905.5
2009	-10,481,249.1	91,017,919.3	-25,677,611.4	65,340,307.8	7,267,663.4	16,886,025.8	67,144,062.2	84,030,088.1
2010	-13,821,196.0	105,828,155.8	-26,250,481.6	79,577,674.2	8,847,292.0	24,333,710.7	75,701,924.1	100,035,634.8
2011	-14,158,499.4	119,399,636.3	-28,738,659.9	90,661,033.7	10,963,909.5	27,459,345.6	106,493,493.9	133,952,839.5
2012	-12,097,153.0	145,004,953.9	-19,662,013.9	125,342,940.0	13,220,840.8	30,456,229.7	117,962,274.2	148,418,503.9
2013	-11,848,835.5	175,226,426.0	-19,093,283.7	156,133,142.3	14,138,304.5	39,301,205.1	85,877,398.0	125,178,603.1
2014	-15,962,696.5	209,607,576.0	-25,580,742.2	184,026,838.3	16,749,122.4	41,356,183.9	119,360,523.0	160,716,706.9
2015	-13,701,336.4	156,468,816.6	-20,558,888.8	135,909,927.8	14,939,502.0	32,714,620.2	97,760,368.8	130,474,989.0
2016	-16,065,275.5	170,949,055.4	-24,593,903.8	146,355,151.6	14,939,502.0	33,324,467.5	97,760,368.8	131,084,836.3
2017	-15,809,031.1	163,502,028.6	-24,470,457.1	139,031,571.5	14,939,502.0	32,107,711.1	97,760,368.8	129,868,080.0
2018	-21,056,821.1	195,016,124.6	-33,353,023.3	161,662,223.3	16,322,959.6	35,882,528.7	125,077,264.1	160,959,928.8
2019	-19,212,056.0	176,593,347.1	-30,557,300.5	146,036,046.6	16,322,959.6	34,866,575.8	125,077,264.1	159,943,839.9
2020	-21,025,206.9	187,990,171.1	-33,309,017.6	154,689,995.5	16,322,959.6	35,423,123.3	125,077,264.1	160,500,387.4
2021	-19,213,314.5	181,484,983.2	-30,366,067.5	151,118,915.8	16,322,959.6	35,110,889.1	125,077,264.1	160,188,153.2
2022	-21,452,355.1	188,579,473.7	-34,212,284.1	154,367,189.6	16,322,959.6	35,672,626.9	125,077,264.1	160,749,891.0
2023	-20,609,701.0	191,296,857.6	-32,691,634.9	158,605,227.7	16,322,959.6	35,527,642.8	125,077,264.1	160,604,906.9
2024	-20,747,939.2	182,801,195.0	-33,021,464.2	149,779,730.8	16,322,959.6	35,257,963.6	125,077,264.1	160,335,227.7
2025	-20,937,143.1	189,420,579.0	-33,169,710.2	156,250,862.8	16,322,959.6	35,554,094.6	125,077,264.1	160,631,358.7
2026	-18,261,816.3	175,604,414.8	-28,873,968.0	146,730,446.8	16,322,959.6	34,547,313.0	125,077,264.1	159,624,577.1
2027	-21,959,882.3	189,934,275.9	-35,006,083.3	154,928,267.6	16,322,959.6	35,546,391.5	125,077,264.1	160,623,655.7
2028	-21,253,347.6	189,940,246.8	-33,717,385.5	156,228,861.3	16,322,959.6	35,507,555.7	125,077,264.1	160,584,819.8
2029	-20,889,890.5	186,148,219.1	-33,055,013.4	153,093,205.7	16,322,959.6	35,254,645.7	125,077,264.1	160,331,909.9
2030	-20,173,284.2	182,070,913.2	-31,916,012.1	150,154,901.1	16,322,959.6	35,140,486.9	125,077,264.1	160,217,751.0
2031	-24,554,080.3	200,060,614.7	-38,834,380.4	161,226,234.2	16,322,959.6	36,224,985.3	125,077,264.1	161,302,249.4
2032	-19,574,793.6	176,810,369.9	-31,073,983.2	145,736,386.8	16,322,959.6	34,897,023.5	125,077,264.1	159,974,287.7
2033	-23,340,828.8	198,404,447.7	-37,176,355.5	161,227,689.3	16,322,959.6	35,835,713.9	125,077,264.1	160,912,978.0
2034	-16,233,245.2	169,669,651.5	-25,304,896.1	144,364,869.0	16,322,959.6	34,337,712.7	125,077,264.1	159,414,976.8
2035	-32,170,474.7	202,479,182.0	-51,737,189.1	150,741,992.9	16,322,959.6	35,718,660.4	125,077,264.1	160,795,924.5

Tables B-18 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor ^a

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	2,051	34,919	0	36,970	0	0	0
1963	0	0	0	7,900	49,811	0	57,711	0	0	0
1964	0	0	0	5,931	68,203	0	74,134	0	0	0
1965	0	0	0	10,918	68,765	62,926	142,609	0	0	0
1966	0	0	0	19,330	52,135	121,141	192,606	0	0	0
1967	0	0	0	19,958	53,785	163,255	236,998	0	0	0
1968	6,989	0	6,989	29,899	120,985	341,768	492,652	0	0	0
1969	8,551	0	8,551	31,859	3,904	298,968	334,731	0	0	0
1970	13,598	0	13,598	49,687	0	431,443	481,130	0	0	0
1971	10,609	0	10,609	23,842	28,328	416,329	468,499	0	0	0
1972	14,434	0	14,434	54,838	144,669	524,208	723,715	0	0	0
1973	14,449	0	14,449	18,398	15,590	547,807	581,795	0	0	0
1974	17,473	0	17,473	9,499	29	636,186	645,714	0	0	0
1975	14,779	0	14,779	22,318	4,765	425,284	452,367	0	0	0
1976	20,856	0	20,856	97,874	121,693	502,769	722,336	0	0	0
1977	22,635	0	22,635	82,578	123,044	497,792	703,414	0	0	0
1978	21,692	0	21,692	74,911	39,986	652,860	767,757	0	0	0
1979	16,237	0	16,237	137,101	77,145	652,629	866,875	0	0	0
1980	19,945	0	19,945	98,743	64,891	517,531	681,165	0	0	0
1981	23,842	0	23,842	126,437	141,456	567,968	835,861	0	0	0
1982	12,157	0	12,157	97,117	46,742	651,246	795,105	0	0	0
1983	2,342	0	2,342	8,171	5,412	148,743	162,326	0	0	0
1984	4,822	0	4,822	26,707	13,141	349,314	389,162	0	0	0
1985	10,188	0	10,188	79,863	102,790	466,291	648,944	0	0	0
1986	15,501	0	15,501	112,370	131,118	932,090	1,175,578	0	0	0
1987	27,223	0	27,223	216,211	234,290	812,631	1,263,132	0	0	0
1988	31,265	11,533	42,798	229,578	297,129	779,537	1,306,244	0	0	0
1989	37,874	66,850	104,724	306,533	304,275	1,051,562	1,662,370	0	0	0
1990	54,736	105,421	160,157	524,114	502,545	1,456,008	2,482,667	0	0	0
1991	8,159	18,824	26,983	105,736	142,105	316,839	564,680	0	(2,636)	(2,636)
1992	12,515	23,808	36,323	93,772	122,436	273,849	490,057	0	0	0
1993	(7,223)	(17,293)	(24,516)	(36,162)	(12,912)	(78,024)	(127,098)	0	0	0
1994	39,106	77,257	116,363	231,800	257,533	642,006	1,131,339	0	0	0
1995	15,701	36,724	52,425	160,663	93,610	151,287	405,560	0	0	0
1996	31,526	96,570	128,096	214,883	186,694	735,431	1,137,008	502	0	502
1997	29,683	116,555	146,238	351,185	219,799	912,861	1,483,845	34,932	233,584	268,516
1998	(6,622)	(19,825)	(26,447)	(8,777)	(18,989)	(72,459)	(100,225)	(17,211)	(89,207)	(106,418)
1999	15,783	52,547	68,330	251,523	188,675	432,833	873,031	52,855	284,356	337,211
2000	21,043	95,937	116,980	332,879	210,531	663,973	1,207,383	67,315	386,374	453,689
2001	305,524	592,877	898,401	1,680,288	991,835	2,458,061	5,130,184	528,728	2,338,847	2,867,575
2002	96,918	303,383	400,301	1,067,733	640,899	1,453,943	3,162,575	245,579	1,558,397	1,803,976
2003	137,141	292,937	430,078	1,076,861	647,733	2,300,943	4,025,537	288,000	1,744,166	2,032,166
2004	151,816	410,075	561,891	1,322,362	623,001	1,609,900	3,555,263	289,108	2,061,934	2,351,042
2005	199,428	445,472	644,900	1,478,745	846,127	2,485,730	4,810,602	348,515	1,913,840	2,262,355
2006	185,763	344,506	530,269	1,257,965	711,556	2,104,543	4,074,064	281,515	1,556,728	1,838,243
2007	357,267	721,419	1,078,686	1,587,862	887,228	2,667,034	5,142,124	360,986	1,552,943	3,012,929
2008	393,248	548,991	942,239	1,492,104	731,558	1,847,752	4,071,414	346,385	1,872,737	2,219,122
2009	238,479	324,274	562,753	902,373	536,264	1,661,116	3,099,753	319,386	1,298,314	1,617,700
2010	311,959	337,527	649,486	1,478,663	687,546	2,121,309	4,287,518	375,834	1,778,133	2,153,967
2011	374,118	364,669	738,787	1,938,478	1,043,462	3,345,770	6,327,710	511,566	2,861,738	3,373,304
2012	895,038	1,746,076	2,641,114	3,029,445	1,398,319	4,722,853	9,150,617	598,869	6,089,166	6,688,035
2013	1,088,781	906,430	1,995,211	2,743,419	1,555,402	4,005,292	8,304,113	1,548,835	3,416,374	4,965,209
2014	974,174	1,196,090	2,170,264	2,984,964	1,634,281	4,043,873	8,663,118	733,943	4,386,280	5,120,223
2015	298,753	366,694	665,447	2,577,732	1,289,608	3,165,413	7,032,753	575,205	3,560,923	4,136,128
2016	338,110	450,754	788,864	2,587,270	1,294,380	3,184,092	7,065,742	579,071	3,577,567	4,156,638
2017	339,347	455,168	794,515	2,686,914	1,268,671	3,180,279	7,063,864	565,736	3,544,360	4,110,096
2018	594,845	510,912	1,105,757	2,769,444	1,307,639	3,229,757	7,306,840	691,912	4,392,915	5,084,827
2019	595,206	511,504	1,106,710	2,739,899	1,293,689	3,184,351	7,217,939	683,388	4,365,187	5,048,575
2020	595,206	511,504	1,106,710	2,753,511	1,300,116	3,206,332	7,259,959	687,636	4,380,377	5,068,013
2021	595,206	511,504	1,106,710	2,746,914	1,297,001	3,195,168	7,239,083	685,423	4,371,855	5,057,278
2022	595,206	511,504	1,106,710	2,767,297	1,306,625	3,224,825	7,298,747	690,800	4,387,186	5,077,986
2023	595,206	511,504	1,106,710	2,755,865	1,301,227	3,210,232	7,267,324	688,400	4,383,229	5,071,629
2024	595,206	511,504	1,106,710	2,753,117	1,299,930	3,203,907	7,256,954	686,973	4,375,869	5,062,842
2025	595,206	511,504	1,106,710	2,759,923	1,303,143	3,215,112	7,278,178	689,161	4,383,951	5,073,112
2026	595,206	511,504	1,106,710	2,725,285	1,286,788	3,164,090	7,176,163	679,835	4,356,474	5,036,309
2027	595,206	511,504	1,106,710	2,758,730	1,302,580	3,213,679	7,274,989	688,938	4,383,741	5,072,679
2028	595,206	511,504	1,106,710	2,756,648	1,301,597	3,210,872	7,269,117	688,456	4,382,681	5,071,137
2029	595,206	511,504	1,106,710	2,748,520	1,297,759	3,198,700	7,244,979	686,207	4,375,778	5,061,985
2030	595,206	511,504	1,106,710	2,748,204	1,297,610	3,196,974	7,242,788	685,742	4,372,663	5,058,405
2031	595,206	511,504	1,106,710	2,781,963	1,313,550	3,247,939	7,343,452	695,205	4,402,261	5,097,466
2032	595,206	511,504	1,106,710	2,743,002	1,295,154	3,188,204	7,226,360	684,007	4,366,018	5,050,025
2033	595,206	511,504	1,106,710	2,763,627	1,304,892	3,222,655	7,291,174	690,789	4,391,637	5,082,426
2034	595,206	511,504	1,106,710	2,723,790	1,286,082	3,159,894	7,169,766	678,831	4,350,754	5,029,585
2035	595,206	511,504	1,106,710	2,751,437	1,299,137	3,207,547	7,258,121	688,366	4,388,442	5,076,808
TOTAL	17,981,079	19,678,730	37,659,809	85,662,592	44,423,416	121,953,023	252,039,031	21,005,723	125,834,936	146,840,659

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor ^a

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	68,977	5,176	0	0	440,922	2,355	4,760	65,680	587,870
1969	56,774	101	0	0	321,387	181	3,338	17,956	399,737
1970	69,818	6,811	0	0	470,867	0	5,595	16,550	569,641
1971	53,097	7,747	0	0	731,754	4,785	6,353	158,419	962,155
1972	62,365	8,515	0	0	1,117,237	2,057	7,375	379,686	1,577,235
1973	33,931	4,615	0	0	751,373	2,307	3,017	77,630	872,873
1974	49,114	4,413	0	45,531	666,973	2,206	3,114	106,332	877,683
1975	63,140	4,671	0	33,862	838,135	2,491	3,920	134,295	1,080,514
1976	70,851	5,132	0	93,991	957,767	2,737	4,910	100,597	1,235,985
1977	26,565	1,758	0	83,339	493,847	3,644	2,602	43,067	654,822
1978	108,944	938	0	188,966	1,605,431	4,319	6,294	24,901	1,939,793
1979	107,956	4,671	0	193,260	2,356,542	5,602	13,172	434,472	3,115,875
1980	88,746	1,935	0	121,603	1,731,588	4,762	7,766	163,301	2,119,701
1981	129,687	18,533	0	259,802	2,401,614	7,275	8,904	263,922	3,089,737
1982	108,561	937	0	138,432	2,382,218	4,541	6,763	48,137	2,689,589
1983	61,443	0	0	13,954	929,183	5,662	3,232	1,218	1,014,692
1984	82,423	0	0	172,730	2,039,966	5,946	7,475	10,496	2,319,036
1985	114,571	12,938	0	228,121	2,581,708	8,422	8,815	271,970	3,226,545
1986	236,756	5,513	0	377,798	4,876,960	17,433	16,927	376,088	5,907,475
1987	187,090	10,273	0	491,023	4,244,094	16,140	15,529	375,604	5,339,753
1988	188,170	14,894	0	494,958	4,280,201	15,528	11,928	374,528	5,380,207
1989	285,261	15,450	0	656,118	6,183,768	20,063	21,693	649,604	7,831,957
1990	218,786	7,710	0	817,290	4,806,772	12,056	12,072	344,008	6,218,694
1991	4,393	1,047	0	185,013	47,869	0	521	10,331	249,174
1992	76,840	4,426	0	217,223	1,709,933	6,059	5,222	151,055	2,170,758
1993	20,064	4,843	0	48,161	371,012	2,090	1,467	123,913	571,550
1994	135,626	7,854	0	461,574	3,427,557	9,967	10,102	293,748	4,346,428
1995	181,772	4,611	0	401,880	3,445,511	11,619	10,492	288,010	4,343,895
1996	286,064	9,577	0	710,852	6,333,517	21,039	16,403	1,196,303	8,573,755
1997	308,515	0	0	557,650	5,720,501	0	15,559	94,838	6,697,063
1998	16,993	(54)	0	(16,341)	91,651	(2)	1,171	(2,095)	91,323
1999	191,682	10,198	0	463,890	3,954,090	12,844	11,542	937,238	5,581,484
2000	174,357	5,181	0	134,665	3,801,279	10,368	9,326	571,156	4,706,332
2001	789,425	25,622	0	156,745	11,882,891	29,390	45,888	1,122,136	14,052,097
2002	425,664	12,226	0	183,569	8,013,780	24,836	29,691	839,772	9,529,538
2003	453,585	14,135	0	493,464	9,966,390	36,340	28,687	1,041,793	12,034,394
2004	519,124	37,676	0	1,403,068	8,919,108	95,754	33,583	859,466	11,867,779
2005	974,060	45,638	0	833,687	17,579,770	235,762	33,910	1,666,525	21,369,352
2006	688,918	31,368	0	953,588	13,232,155	91,085	27,848	1,034,208	16,059,170
2007	608,373	28,090	0	756,878	11,896,283	77,929	32,262	1,173,789	14,573,604
2008	359,413	15,350	0	716,860	7,405,592	62,177	23,279	549,541	9,132,212
2009	204,089	9,945	0	70,537	5,481,765	32,616	12,515	353,994	6,165,461
2010	459,359	50,470	0	159,747	10,118,293	74,903	32,732	890,045	11,785,549
2011	982,468	31,589	0	757,549	21,071,682	110,753	31,489	912,847	23,898,377
2012	604,445	58,600	0	1,500,335	13,095,807	128,896	57,257	1,495,480	16,940,820
2013	760,071	45,293	0	2,319,675	15,857,177	143,072	65,054	1,342,516	20,532,858
2014	743,281	44,293	0	2,356,967	16,119,444	140,446	59,280	1,312,861	20,776,572
2015	536,915	31,995	0	1,703,570	11,855,918	101,972	40,061	948,356	15,218,787
2016	555,336	33,093	0	1,782,841	12,152,881	105,377	40,708	980,893	15,651,129
2017	518,583	30,903	0	1,674,069	11,648,773	98,584	37,219	915,975	14,924,106
2018	590,816	35,207	0	1,926,299	13,338,719	112,188	42,508	1,043,562	17,089,299
2019	560,128	33,379	0	1,807,861	12,586,919	106,516	40,614	989,358	16,124,775
2020	576,940	34,380	0	1,876,114	13,018,691	109,623	41,487	1,019,051	16,676,286
2021	567,508	33,818	0	1,837,311	12,773,612	107,880	41,064	1,002,392	16,363,585
2022	584,476	34,829	0	1,896,229	13,150,873	111,016	42,370	1,032,363	16,852,156
2023	580,097	34,568	0	1,891,024	13,112,239	110,207	41,638	1,024,627	16,794,400
2024	571,951	34,083	0	1,851,896	12,867,526	108,701	41,461	1,010,239	16,485,857
2025	580,896	34,616	0	1,889,084	13,102,357	110,355	41,898	1,026,039	16,785,245
2026	550,485	32,804	0	1,781,276	12,413,315	104,734	39,678	972,324	15,894,616
2027	580,663	34,602	0	1,889,959	13,107,087	110,312	41,821	1,025,628	16,790,072
2028	579,490	34,532	0	1,886,847	13,086,745	110,095	41,686	1,023,556	16,762,953
2029	571,851	34,077	0	1,859,291	12,910,847	108,683	41,167	1,010,062	16,535,978
2030	568,402	33,872	0	1,841,299	12,798,868	108,045	41,147	1,003,972	16,395,605
2031	601,161	35,824	0	1,965,184	13,586,339	114,100	43,310	1,061,833	17,407,751
2032	561,048	33,433	0	1,810,852	12,606,585	106,686	40,813	990,982	16,150,399
2033	589,402	35,123	0	1,931,230	13,365,378	111,927	42,135	1,041,064	17,116,259
2034	544,154	32,427	0	1,751,650	12,227,802	103,563	39,582	961,141	15,660,319
2035	585,867	34,912	0	1,935,813	13,384,900	111,273	41,354	1,034,819	17,128,938
TOTAL	24,397,776	1,353,386	0	59,027,713	515,849,738	3,780,292	1,644,557	43,816,167	649,869,629

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor ^a

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	30,401	0	0	0	0	0	0	0	0
1969	0	30,627	0	0	0	0	0	0	0	0
1970	0	39,430	0	0	0	0	0	0	0	0
1971	0	34,871	0	0	0	0	0	0	0	0
1972	710	47,571	0	6,602	0	4,156	783	0	15,117	0
1973	270	28,968	96,209	6,453	149,289	3,687	0	0	249,193	0
1974	15,040	28,982	96,540	9,458	150,844	4,770	211	0	161,738	5,961
1975	97,373	28,568	105,611	12,447	165,961	6,274	0	0	129,042	50,723
1976	379,830	38,365	132,461	17,464	209,148	8,052	0	0	132,365	65,476
1977	194,137	21,006	0	22,635	0	1,924	1,633	0	206,587	74,838
1978	572,290	45,550	170,805	20,478	259,155	2,686	0	0	35,203	67,462
1979	1,045,698	83,936	225,048	28,179	335,459	2,299	89,456	0	228	3,668
1980	1,390,117	51,143	256,759	29,229	401,038	3,667	94,362	0	0	16,504
1981	1,480,362	118,583	274,149	33,632	430,304	23,861	90,590	0	254,649	57,523
1982	923,973	132,575	292,674	27,190	461,216	0	230,608	0	126,461	189,895
1983	333,772	(335,712)	172,336	10,792	272,477	385	0	0	(71,602)	(8,768)
1984	485,847	(142,910)	273,597	19,572	433,785	15	0	0	(66,353)	(91,433)
1985	821,069	(335,343)	413,406	34,603	657,011	0	0	32,464	(47,544)	(32,348)
1986	1,109,047	54,812	728,808	60,274	1,160,650	5,548	0	105,375	69,170	101,843
1987	1,019,605	(40,745)	668,383	63,601	1,083,530	32,651	585	157,843	88,076	49,930
1988	1,019,793	(74,006)	688,891	66,914	1,134,141	11,991	300	50,654	92,465	38,688
1989	1,736,901	178,359	978,885	97,114	1,633,489	38,289	8,951	350,953	340,460	210,334
1990	2,442,558	422,502	1,402,619	110,934	2,313,410	90,472	0	446,408	599,573	530,099
1991	286,485	(3,054)	277,078	33,945	456,999	17,978	128,405	132,700	35,339	52,116
1992	587,340	(208,900)	240,119	11,952	396,022	4,871	241,338	78,306	(22,718)	(53,500)
1993	(190,611)	(491,161)	(809,033)	(2,389)	(1,334,429)	(3,246)	(61,112)	(29,466)	(157,452)	(519,798)
1994	1,841,902	66,338	189,616	34,480	312,714	41,201	731,185	315,446	122,829	204,783
1995	761,209	(247,735)	(251,547)	7,960	(414,889)	7,727	165,622	114,342	(7,579)	(140,714)
1996	1,883,530	72,171	508,274	18,313	838,330	16,510	289,044	385,745	49,537	133,848
1997	2,121,818	22,440	365,342	24,076	330,153	15,099	414,596	438,212	61,553	115,882
1998	(577,005)	(733,387)	(3,979,131)	(2,991)	(3,279,862)	(4,405)	(46,209)	(84,367)	(87,188)	(432,227)
1999	1,250,830	(475,206)	(683,915)	18,893	(787,153)	6,193	172,541	252,025	(174,420)	(244,303)
2000	1,481,878	(470,169)	(581,288)	19,761	(799,819)	0	241,855	160,640	(252,702)	(207,941)
2001	10,780,179	4,459,357	1,501,882	207,113	2,477,279	0	853,031	1,793,350	4,371,631	389,499
2002	3,940,463	1,972,885	737,668	162,408	1,216,898	0	332,517	1,250,856	3,146,931	1,094,108
2003	5,099,608	3,152,332	907,119	145,665	1,495,995	0	1,429,082	980,945	1,640,074	1,377,604
2004	5,204,461	3,238,845	1,014,120	192,203	1,389,538	0	1,340,546	1,058,862	3,796,147	822,378
2005	5,993,622	3,010,142	3,450,501	89,937	3,983,670	0	1,579,924	1,173,260	2,653,088	1,134,829
2006	6,421,419	2,254,949	7,072,099	56,536	2,919,942	0	3,172,908	997,915	2,183,925	950,967
2007	9,372,004	4,243,095	7,374,413	231,256	3,044,710	0	6,185,570	2,224,986	6,106,064	405,236
2008	5,843,934	4,877,744	3,816,688	115,368	2,647,118	3,043	3,560,610	1,735,122	4,115,604	759,314
2009	3,960,610	2,401,246	3,169,814	91,914	1,269,334	3,733	3,078,749	1,363,291	3,194,951	800,650
2010	6,236,498	2,828,988	7,589,163	42,434	2,812,248	0	4,698,432	1,169,590	4,868,324	1,729,754
2011	11,280,130	3,003,424	9,349,472	24,709	3,767,481	0	672,064	1,258,591	3,675,492	2,443,131
2012	8,305,176	4,972,484	11,129,063	176,769	6,861,494	198,358	0	2,219,744	9,411,894	2,271,130
2013	14,312,227	6,365,951	13,055,770	613,790	5,260,999	232,801	7,155,334	2,155,944	9,689,886	1,887,354
2014	14,683,748	7,371,083	16,059,222	342,547	6,471,280	278,837	11,600,138	2,582,271	11,917,296	3,343,011
2015	11,327,626	5,705,957	11,772,466	279,545	4,743,874	209,740	8,868,062	1,942,377	8,737,992	1,701,838
2016	12,737,297	6,151,933	12,845,705	315,748	5,176,350	229,652	10,119,577	2,126,781	9,534,344	1,856,987
2017	12,511,413	5,878,382	12,330,030	315,390	4,968,552	219,645	9,654,498	2,034,106	9,151,595	2,376,587
2018	14,985,953	6,824,026	15,078,812	375,269	6,076,211	263,159	11,484,580	2,437,080	11,190,413	2,906,409
2019	13,577,483	6,185,953	13,442,608	339,226	5,416,880	238,353	10,345,779	2,207,356	9,976,645	2,591,034
2020	14,473,395	6,539,210	14,393,803	360,681	5,800,177	254,143	11,031,531	2,353,587	10,682,357	2,774,375
2021	13,941,574	6,391,999	13,860,885	348,498	5,585,431	244,767	10,663,466	2,266,753	10,286,943	2,671,656
2022	14,527,572	6,530,740	14,478,090	361,166	5,834,142	255,069	11,041,127	2,362,164	10,744,603	2,790,621
2023	14,699,947	6,696,465	14,768,723	367,763	5,951,256	258,139	11,253,325	2,390,587	10,960,320	2,846,640
2024	14,081,919	6,341,395	13,953,533	351,497	5,622,764	247,231	10,712,813	2,289,577	10,355,797	2,689,514
2025	14,574,709	6,603,457	14,601,864	364,168	5,884,018	255,918	11,125,900	2,370,024	10,836,515	2,814,478
2026	13,476,342	6,207,959	13,338,633	337,321	5,374,982	236,599	10,319,288	2,191,116	9,899,643	2,570,993
2027	14,637,986	6,550,816	14,578,054	363,679	5,874,424	257,038	11,122,818	2,380,396	10,818,862	2,809,889
2028	14,623,739	6,601,535	14,543,787	363,748	5,860,615	256,791	11,144,062	2,378,109	10,793,580	2,803,284
2029	14,333,562	6,472,882	14,324,135	357,893	5,772,104	251,685	10,929,092	2,330,822	10,630,500	2,760,946
2030	14,016,622	6,354,243	13,955,653	349,901	5,623,619	246,089	10,679,705	2,278,999	10,357,139	2,689,922
2031	15,466,758	6,812,667	15,528,924	383,989	6,257,589	271,621	11,748,398	2,515,450	11,524,104	2,993,167
2032	13,608,049	6,174,587	13,490,642	339,904	5,436,236	238,886	10,348,900	2,212,291	10,012,207	2,600,292
2033	15,296,520	6,805,943	15,315,508	380,224	6,171,591	268,656	11,650,626	2,487,987	11,366,012	2,952,031
2034	12,985,442	6,110,394	12,917,446	327,804	5,205,259	227,934	10,012,816	2,180,869	9,587,129	2,489,810
2035	15,809,352	6,387,622	15,809,182	387,793	6,370,523	277,739	11,893,057	2,572,101	11,731,823	3,047,186
TOTAL	431,643,107	185,438,504	384,869,229	10,705,427	171,593,556	6,268,261	274,603,069	73,110,539	291,831,857	75,385,163

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor ^a

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	0	0	0	192,606
1967	0	0	0	0	0	0	0	0	0	236,998
1968	0	0	0	30,401	0	0	0	0	0	1,117,912
1969	0	0	0	30,627	0	0	0	0	0	773,646
1970	0	0	0	39,430	0	0	0	0	0	1,103,799
1971	0	0	0	34,871	0	0	0	0	0	1,476,134
1972	0	752,580	0	827,519	0	0	0	0	0	3,142,903
1973	0	942,905	0	1,476,974	0	0	0	0	0	2,946,091
1974	0	1,683,743	0	2,157,287	0	0	0	0	0	3,698,157
1975	0	3,687,903	0	4,283,902	0	0	0	0	0	5,831,562
1976	0	5,253,329	0	6,236,490	0	0	0	0	0	8,215,667
1977	0	(977,112)	0	(454,352)	0	0	0	0	0	926,519
1978	0	3,468,162	0	4,641,791	0	0	0	0	0	7,371,033
1979	0	3,795,878	0	5,609,849	0	0	0	0	0	9,608,836
1980	0	5,362,245	0	7,605,064	0	0	0	0	0	10,425,875
1981	0	10,862,932	0	13,626,585	0	0	0	0	0	17,576,025
1982	0	7,685,168	0	10,069,760	0	0	0	0	0	13,566,611
1983	0	(8,994,497)	0	(8,620,817)	0	0	0	0	0	(7,441,457)
1984	0	(7,633,741)	0	(6,721,621)	0	0	0	0	0	(4,008,601)
1985	0	(15,213,299)	0	(13,669,981)	0	0	0	0	0	(9,784,304)
1986	0	1,135,478	0	4,531,005	0	0	0	0	0	11,629,559
1987	0	(3,007,097)	0	116,362	0	0	0	0	0	6,746,470
1988	0	(3,407,929)	0	(378,098)	0	0	0	0	0	6,351,151
1989	0	9,488,536	0	15,062,251	0	0	0	0	0	24,661,302
1990	0	30,759,725	204,582	39,322,882	0	0	0	0	0	48,184,400
1991	0	184,870	22,623	1,625,484	0	0	0	0	0	2,463,685
1992	0	(9,471,028)	0	(8,196,198)	0	0	0	0	0	(5,499,060)
1993	0	(21,473,875)	0	(25,072,572)	0	0	0	0	0	(24,652,636)
1994	0	4,059,683	0	7,920,177	0	0	0	0	0	13,514,307
1995	0	(4,895,977)	0	(4,901,581)	0	0	0	0	0	(99,701)
1996	0	1,859,275	0	6,054,577	0	0	0	0	0	15,893,938
1997	0	2,428,729	(921)	6,336,979	0	0	0	0	0	14,932,641
1998	0	(14,593,773)	(68,568)	(23,889,113)	0	0	0	0	0	(24,030,880)
1999	0	(9,859,076)	(31,704)	(10,555,295)	0	0	0	0	0	(3,695,239)
2000	0	(19,818,914)	(7,362)	(20,234,061)	0	0	0	0	0	(13,749,677)
2001	0	158,521,299	266,398	185,621,018	0	0	0	0	0	208,569,275
2002	0	59,840,151	279,773	73,974,658	0	0	0	0	0	88,871,048
2003	7,286	94,300,920	357,946	110,894,576	0	0	0	0	0	129,416,751
2004	97,767	106,695,328	415,475	125,265,670	0	0	0	0	0	143,601,645
2005	84,291	113,878,762	123,138	137,155,164	0	0	0	0	0	166,242,373
2006	440,290	83,249,766	93,302	109,814,018	0	0	0	0	0	132,315,764
2007	613,783	138,056,387	317,820	178,175,324	0	0	0	0	0	201,982,667
2008	744,408	84,431,902	411,322	113,062,175	0	0	0	0	0	129,427,162
2009	700,797	56,490,071	335,117	76,860,277	0	0	0	0	0	88,305,944
2010	1,113,941	91,063,768	406,968	124,560,108	0	0	0	0	0	143,436,628
2011	1,588,565	135,241,350	435,066	172,739,475	0	0	0	0	0	207,077,653
2012	2,638,222	155,565,619	1,165,248	204,915,201	0	0	0	0	0	240,335,787
2013	2,299,690	174,771,682	1,441,285	239,242,713	0	0	0	0	0	275,040,104
2014	2,543,071	187,257,252	1,704,589	266,154,345	0	0	0	0	0	302,884,522
2015	2,083,998	137,501,378	1,262,046	196,136,899	0	0	0	0	0	223,190,014
2016	2,343,801	149,143,621	1,363,679	213,945,475	0	0	0	0	0	241,607,848
2017	2,174,720	142,517,463	1,297,533	205,429,914	0	0	0	0	0	232,322,495
2018	2,478,035	170,965,340	1,518,002	246,583,289	0	0	0	0	0	277,170,012
2019	2,297,957	153,287,804	1,372,078	221,279,156	0	0	0	0	0	250,777,155
2020	2,402,559	163,391,935	1,455,164	235,912,917	0	0	0	0	0	266,023,885
2021	2,343,979	158,214,204	1,417,462	228,237,617	0	0	0	0	0	258,004,273
2022	2,412,129	163,917,976	1,453,966	236,709,365	0	0	0	0	0	267,044,964
2023	2,443,716	167,551,969	1,489,234	241,678,084	0	0	0	0	0	271,918,147
2024	2,354,285	158,393,806	1,410,428	228,804,559	0	0	0	0	0	258,716,922
2025	2,425,521	165,486,522	1,468,949	238,812,043	0	0	0	0	0	269,055,288
2026	2,286,208	152,756,152	1,375,146	220,370,382	0	0	0	0	0	249,584,180
2027	2,422,883	164,815,543	1,460,516	238,092,904	0	0	0	0	0	268,337,354
2028	2,419,076	165,050,946	1,469,732	238,309,004	0	0	0	0	0	268,518,921
2029	2,394,802	162,274,305	1,440,313	234,273,041	0	0	0	0	0	264,222,693
2030	2,354,399	158,532,724	1,411,715	228,850,730	0	0	0	0	0	258,654,238
2031	2,527,679	174,060,939	1,524,433	251,615,718	0	0	0	0	0	282,571,097
2032	2,303,297	153,527,346	1,370,357	221,662,994	0	0	0	0	0	251,196,488
2033	2,503,844	172,474,757	1,521,313	249,195,012	0	0	0	0	0	279,791,581
2034	2,240,000	148,846,984	1,347,110	214,408,997	0	0	0	0	0	243,375,377
2035	2,557,670	172,018,692	1,454,461	250,317,201	0	0	0	0	0	280,887,778
TOTAL	62,642,669	4,968,159,486	37,755,734	6,974,006,601	0	0	0	0	0	8,060,415,729

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-19 Total Transportation Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,231	13,756	36,029	49,785
1966	18,064	0	18,064	419,467	421,722	1,412,954	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	539,116	498,441	1,686,098	2,723,655	56,469	118,263	174,732
1968	128,628	0	128,628	663,846	603,483	1,985,220	3,252,548	115,960	229,807	345,767
1969	254,715	0	254,715	787,389	539,340	2,083,253	3,409,982	185,156	358,861	544,017
1970	277,547	0	277,547	823,162	532,567	2,202,766	3,558,496	200,150	387,675	587,826
1971	227,474	0	227,474	788,279	552,113	2,169,897	3,510,289	202,413	392,912	595,325
1972	224,978	0	224,978	830,051	678,520	2,320,421	3,828,991	209,057	406,589	615,646
1973	221,091	31,366	252,457	795,335	549,393	2,338,619	3,683,347	206,557	402,723	609,280
1974	240,498	32,938	273,437	819,171	564,594	2,506,358	3,890,122	208,545	407,090	615,636
1975	237,459	36,291	273,750	869,126	605,731	2,409,923	3,884,779	225,895	439,873	665,768
1976	271,292	40,836	312,127	959,939	734,812	2,500,506	4,195,256	228,976	447,299	676,276
1977	293,627	45,096	338,723	924,173	713,558	2,476,399	4,114,130	238,699	468,721	707,420
1978	273,870	49,178	323,048	979,589	692,588	2,785,987	4,458,164	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,044,836	736,358	2,813,578	4,594,773	243,110	483,437	726,547
1980	310,846	67,748	378,594	1,162,930	866,372	3,028,204	5,057,505	269,858	537,074	806,932
1981	347,781	87,408	435,189	1,128,690	879,357	2,917,582	4,925,629	288,997	586,256	875,254
1982	438,335	106,918	545,254	1,166,660	850,483	3,262,104	5,279,247	290,049	582,758	872,807
1983	354,787	151,259	506,046	1,178,309	900,363	3,795,446	5,874,118	319,214	633,181	952,395
1984	467,336	224,245	691,581	1,470,510	1,097,480	5,737,801	8,305,792	351,621	695,559	1,047,179
1985	736,074	364,305	1,100,379	1,921,037	1,789,369	6,551,546	10,261,951	394,593	766,994	1,171,587
1986	1,084,728	692,479	1,777,207	1,748,322	1,528,732	6,863,229	10,140,283	385,545	762,683	1,148,229
1987	1,773,801	1,559,243	3,333,044	2,238,265	2,011,876	6,675,355	10,925,496	385,290	812,310	1,197,599
1988	2,231,563	2,333,792	4,565,356	2,239,976	2,210,523	6,368,849	10,819,348	420,153	978,621	1,398,774
1989	2,397,272	3,326,435	5,723,708	2,156,341	1,872,030	5,916,713	9,945,084	414,225	1,162,723	1,576,948
1990	2,746,134	3,433,321	6,179,455	2,575,700	2,261,914	6,668,440	11,506,053	487,609	1,234,409	1,722,018
1991	2,748,636	3,682,311	6,430,947	1,755,328	1,621,188	4,527,928	7,904,444	491,419	1,476,387	1,967,806
1992	2,554,528	3,528,958	6,083,486	2,076,509	2,003,327	5,385,858	9,465,694	551,042	1,491,155	2,042,197
1993	2,592,888	3,504,240	6,097,129	2,881,751	2,011,222	6,511,865	11,404,838	610,116	1,675,438	2,285,554
1994	2,718,329	3,537,459	6,255,788	2,908,502	2,642,460	7,314,515	12,865,477	767,900	2,473,449	3,241,349
1995	2,649,273	3,509,935	6,159,208	3,036,862	2,289,028	5,893,667	11,219,557	995,341	4,977,122	5,972,463
1996	2,699,210	3,891,715	6,590,925	2,586,005	2,137,443	6,675,491	11,398,939	1,837,384	13,766,531	15,603,915
1997	2,641,891	3,631,175	6,273,065	2,659,261	2,007,332	6,551,468	11,218,061	2,294,918	21,860,553	24,155,471
1998	2,538,764	3,478,063	6,016,827	2,265,658	2,064,166	6,296,049	10,625,873	2,976,897	26,690,793	29,667,690
1999	2,690,995	3,843,920	6,534,914	2,891,467	2,454,592	8,386,089	13,732,147	3,032,982	27,474,863	30,507,845
2000	2,835,022	4,315,247	7,150,269	3,892,119	2,286,216	6,970,396	13,148,731	2,956,339	27,864,566	30,820,905
2001	3,365,876	4,977,426	8,343,302	7,395,830	2,798,600	8,458,921	18,653,351	3,513,420	30,049,110	33,562,531
2002	3,561,308	5,086,073	8,647,381	10,848,480	2,778,183	9,921,992	23,548,655	3,228,052	29,679,832	32,907,884
2003	3,679,176	5,431,485	9,110,661	7,534,525	2,521,449	8,768,393	18,824,368	3,318,489	29,977,960	33,296,449
2004	4,161,021	5,685,821	9,846,842	5,739,811	2,828,065	8,244,218	16,812,094	3,335,629	30,424,387	33,760,016
2005	3,515,062	5,184,413	8,699,475	5,730,890	2,969,170	8,984,458	17,684,518	3,459,140	30,516,889	33,976,028
2006	3,438,339	4,686,149	8,124,488	5,651,886	2,937,140	9,044,759	17,633,784	3,292,562	30,125,835	33,418,396
2007	3,686,581	5,301,491	8,988,073	6,719,434	3,466,396	10,337,939	20,523,768	3,450,761	31,391,533	34,842,294
2008	4,357,745	5,155,658	9,513,403	7,524,800	3,735,870	10,447,432	21,708,108	3,939,626	32,583,658	36,523,284
2009	4,824,323	5,194,825	10,019,149	6,534,733	3,312,939	10,312,725	20,160,397	3,772,727	31,059,202	34,831,928
2010	5,089,774	6,512,686	11,602,461	7,425,660	3,678,638	11,224,557	22,328,855	4,163,275	33,401,695	37,564,970
2011	5,491,861	6,846,546	12,338,407	8,790,300	4,394,966	13,268,998	26,454,265	4,265,619	34,640,101	38,905,720
2012	6,279,551	8,710,368	14,989,919	10,996,158	5,244,451	15,940,405	32,181,014	4,556,863	38,734,120	43,290,983
2013	6,324,165	7,689,360	14,013,525	10,309,645	5,279,217	14,547,661	30,136,523	5,558,389	35,365,873	40,924,262
2014	6,027,412	7,639,201	13,666,612	9,729,946	4,892,365	13,369,300	27,991,612	4,376,145	35,623,227	39,999,372
2015	5,583,939	7,272,407	12,856,346	9,235,591	4,478,174	12,166,610	25,880,375	4,303,953	35,237,844	39,541,797
2016	5,630,317	7,403,649	13,033,966	9,234,859	4,468,129	12,058,144	25,761,132	4,309,583	35,368,788	39,678,371
2017	5,622,834	7,446,732	13,069,566	9,296,720	4,427,969	11,911,287	25,635,976	4,280,941	35,424,893	39,705,834
2018	5,794,924	7,532,146	13,327,070	9,242,341	4,418,697	11,896,945	25,557,983	4,364,079	36,272,490	40,636,569
2019	5,764,783	7,572,883	13,337,666	9,143,184	4,387,098	11,798,333	25,328,615	4,353,370	36,368,562	40,721,932
2020	5,780,604	7,614,044	13,394,647	9,160,252	4,397,993	11,833,929	25,392,174	4,370,173	36,541,622	40,911,795
2021	5,801,818	7,658,564	13,460,382	9,201,311	4,418,537	11,886,714	25,506,561	4,385,296	36,717,523	41,102,818
2022	5,819,647	7,699,574	13,519,221	9,254,582	4,444,302	11,959,051	25,657,936	4,404,827	36,898,209	41,303,036
2023	5,833,744	7,703,389	13,537,133	9,263,987	4,449,477	11,972,936	25,686,400	4,414,634	36,947,015	41,361,649
2024	5,846,816	7,740,307	13,587,123	9,287,006	4,460,957	12,001,724	25,749,687	4,426,255	36,998,076	41,424,331
2025	5,850,451	7,772,845	13,623,295	9,303,741	4,469,451	12,029,401	25,802,593	4,438,470	37,046,530	41,484,999
2026	5,864,322	7,809,606	13,673,928	9,306,509	4,471,390	12,027,559	25,805,458	4,445,274	37,092,719	41,537,993
2027	5,880,575	7,847,446	13,728,021	9,378,050	4,505,563	12,125,480	26,009,093	4,470,089	37,193,153	41,663,242
2028	5,895,695	7,884,739	13,780,434	9,407,426	4,519,785	12,163,300	26,090,520	4,480,445	37,251,746	41,732,191
2029	5,911,168	7,922,895	13,834,063	9,432,048	4,531,645	12,193,545	26,157,238	4,494,227	37,317,051	41,811,278
2030	5,918,750	7,949,549	13,868,299	9,462,289	4,546,489	12,232,901	26,241,679	4,508,984	37,380,370	41,889,354
2031	5,923,241	7,971,865	13,895,106	9,524,118	4,575,550	12,320,728	26,420,396	4,530,660	37,465,479	41,996,139
2032	5,930,060	7,994,748	13,924,808	9,527,675	4,578,348	12,317,298	26,423,321	4,537,905	37,516,064	42,053,969
2033	5,918,306	7,991,551	13,909,857	9,587,395	4,607,504	12,403,785	26,598,684	4,562,299	37,625,345	42,187,644
2034	5,865,716	7,959,631	13,825,347	9,575,872	4,602,031	12,377,693	26,555,596	4,566,699	37,660,308	42,227,007
2035	5,738,297	7,858,481	13,596,778	9,630,872	4,628,172	12,461,974	26,721,018	4,592,619	37,774,857	42,367,476
TOTAL	228,536,871	296,267,772	524,804,643	365,420,187	192,349,238	563,249,978	1,121,019,402	170,606,263	1,371,332,045	1,541,938,308

TABLE B-19 Total Transportation Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								Total
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,812	0	0	0	0	293,869
1968	185,309	8,944	54,589	445,438	1,547,295	13,770	11,639	209,482	2,478,866
1969	180,916	7,751	87,576	525,094	2,398,076	12,625	10,647	359,249	3,581,934
1970	203,000	14,518	94,674	573,999	2,922,173	12,790	13,186	295,348	4,129,688
1971	199,388	15,476	95,695	605,889	3,795,813	17,763	14,492	450,574	5,195,089
1972	222,057	16,344	98,789	631,615	4,974,074	15,220	20,842	1,087,061	7,066,001
1973	204,746	12,415	97,550	639,250	4,925,188	15,483	11,805	411,356	6,317,793
1974	285,286	12,384	98,460	697,026	5,238,089	15,590	12,896	601,660	6,961,391
1975	352,803	13,329	106,703	714,888	6,364,785	16,620	14,584	733,178	8,316,890
1976	307,151	13,875	108,083	773,628	6,721,877	16,994	16,269	568,060	8,525,937
1977	269,095	10,985	112,554	796,324	6,903,845	18,456	14,042	514,797	8,640,098
1978	358,099	4,441	115,521	889,236	8,354,111	18,922	18,088	508,706	10,267,123
1979	388,492	13,722	114,253	895,406	9,480,073	20,202	25,023	958,019	11,895,190
1980	409,787	12,072	125,950	888,893	10,056,258	20,749	24,454	742,418	12,280,581
1981	473,278	29,913	134,169	1,076,040	11,509,214	24,939	23,077	914,021	14,184,651
1982	467,787	13,063	135,057	997,853	12,349,463	22,955	22,548	751,675	14,760,402
1983	641,113	14,657	149,201	1,027,258	15,555,486	39,971	29,277	428,739	17,895,703
1984	913,826	15,071	164,505	2,019,473	23,732,858	54,428	59,800	788,398	27,748,358
1985	1,102,406	87,632	184,905	2,336,069	28,014,860	69,483	70,333	2,173,874	34,039,563
1986	1,266,677	34,088	180,445	2,365,159	30,571,239	80,769	76,200	2,189,233	36,763,810
1987	1,125,286	50,883	179,872	2,791,630	29,386,567	78,018	74,450	2,248,493	35,935,200
1988	1,110,926	61,678	193,735	2,720,417	29,320,257	74,168	60,332	2,206,384	35,747,896
1989	1,146,478	49,360	187,914	2,410,514	29,380,273	67,049	68,803	2,450,021	35,760,412
1990	867,642	34,522	221,391	2,512,729	27,502,352	51,057	49,235	1,877,412	33,116,340
1991	586,485	23,427	220,282	2,055,250	17,673,157	27,930	27,004	1,237,977	21,851,512
1992	596,207	39,263	241,456	2,359,679	25,981,387	55,796	51,058	1,915,117	31,599,962
1993	1,168,497	53,790	264,959	2,769,058	31,515,871	72,890	69,741	2,648,705	38,563,510
1994	1,023,587	43,916	306,359	2,799,086	29,371,000	60,461	57,508	2,124,635	35,786,552
1995	1,520,275	46,774	304,297	3,491,835	36,492,589	88,875	80,331	2,778,745	44,803,721
1996	1,349,677	48,406	389,202	3,555,587	36,471,608	86,093	73,979	4,324,636	46,299,188
1997	1,391,206	25,563	276,681	3,014,997	32,730,477	36,715	68,839	1,678,713	39,223,191
1998	1,235,089	34,518	381,846	2,654,434	29,393,954	41,836	60,134	1,808,957	35,610,768
1999	1,231,206	56,058	370,780	3,066,836	31,557,895	75,574	65,507	4,175,757	40,599,613
2000	1,048,160	37,634	304,447	2,307,508	26,114,573	60,753	53,914	2,728,036	32,655,025
2001	1,746,321	63,091	328,182	2,236,815	34,045,036	80,160	101,348	3,067,549	41,668,502
2002	1,320,307	43,741	320,888	2,330,380	28,994,806	73,348	77,949	2,554,514	35,715,933
2003	1,394,920	48,959	342,637	2,753,073	31,957,637	89,938	79,480	2,884,859	39,551,520
2004	1,451,564	78,277	345,114	3,761,882	30,579,778	234,492	82,048	2,397,462	38,930,617
2005	2,031,771	87,784	355,918	2,968,967	41,462,709	417,026	81,246	3,431,770	50,837,191
2006	1,760,096	73,813	295,907	3,240,136	37,082,374	248,304	77,978	2,752,450	45,531,058
2007	1,643,819	69,156	332,864	3,042,813	35,242,832	232,053	81,871	2,924,267	43,569,675
2008	1,497,262	61,527	468,537	3,416,335	34,545,307	244,234	79,951	2,403,449	42,716,602
2009	1,224,868	50,848	433,836	2,189,447	30,808,898	193,749	63,648	2,044,876	37,010,171
2010	1,499,040	112,815	508,081	2,374,052	37,052,063	258,888	90,262	2,744,406	44,639,606
2011	2,203,569	82,971	500,161	3,447,595	51,924,271	307,192	94,353	2,754,397	61,314,509
2012	1,735,708	119,323	563,822	4,648,918	43,750,397	343,309	126,019	3,605,419	54,892,915
2013	1,930,360	97,413	569,989	5,293,040	45,313,774	336,210	129,094	3,245,255	56,915,135
2014	1,681,889	84,081	540,454	4,719,735	40,625,313	299,975	106,328	2,815,084	50,872,859
2015	1,466,242	74,042	571,074	4,108,449	37,461,513	268,948	89,529	2,517,870	46,557,667
2016	1,487,568	75,295	570,318	4,132,427	37,848,728	272,945	90,277	2,555,079	47,032,636
2017	1,456,304	73,414	560,660	3,907,130	37,505,810	267,150	87,089	2,499,392	46,356,950
2018	1,523,722	77,412	542,576	4,023,031	39,125,911	270,402	91,881	2,618,006	48,272,940
2019	1,499,404	75,946	538,763	3,861,336	38,547,971	265,142	90,352	2,574,580	47,453,494
2020	1,450,723	77,348	541,660	3,915,020	39,164,771	269,257	91,643	2,616,264	48,126,686
2021	1,451,109	77,381	545,308	3,883,488	39,180,290	269,259	91,888	2,617,359	48,116,081
2022	1,473,530	78,729	549,495	3,947,573	39,723,576	273,401	93,524	2,657,374	48,797,202
2023	1,472,293	78,667	553,849	3,944,672	39,801,203	273,182	92,943	2,655,607	48,872,416
2024	1,468,240	78,436	558,158	3,913,111	39,693,912	272,453	92,989	2,648,872	48,726,171
2025	1,478,192	79,041	562,470	3,947,648	39,999,496	274,294	93,411	2,666,878	49,101,431
2026	1,454,383	77,634	567,128	3,855,455	39,503,452	269,918	91,607	2,625,256	48,444,834
2027	1,491,612	79,864	571,460	3,980,208	40,400,475	276,805	94,199	2,691,450	49,586,073
2028	1,496,291	80,155	574,049	3,990,235	40,557,769	277,628	94,421	2,700,152	49,770,700
2029	1,495,178	80,100	578,808	3,976,895	40,574,706	277,422	94,307	2,698,630	49,776,046
2030	1,497,396	80,246	583,644	3,970,355	40,637,390	277,823	94,627	2,703,000	49,844,481
2031	1,536,818	82,607	587,233	4,093,583	41,621,691	284,769	97,205	2,773,084	51,076,990
2032	1,503,447	80,629	592,451	3,959,485	40,840,979	278,683	95,128	2,714,597	50,065,398
2033	1,538,595	82,737	597,393	4,092,977	41,800,510	285,115	96,873	2,777,143	51,271,343
2034	1,500,210	80,463	602,109	3,925,269	40,865,665	277,940	94,748	2,709,808	50,056,212
2035	1,548,864	83,374	606,766	4,118,812	42,227,774	286,768	96,954	2,796,219	51,765,531
TOTAL	78,603,552	3,683,791	24,010,708	187,856,951	1,968,775,525	10,513,124	4,577,207	144,331,812	2,422,352,671

TABLE B-19 Total Transportation Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,853	0	0	0	726	0	0	0	51,729	0
1964	63,658	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	119,982	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,068	35,344
1966	218,279	101,265	62,476	12,478	76,887	3,753	94,978	27,679	232,502	61,465
1967	422,318	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	744,780	478,399	218,649	41,509	265,168	12,870	328,574	95,466	782,164	208,926
1969	1,073,827	724,842	334,105	61,226	394,024	18,694	487,928	138,064	1,205,834	321,755
1970	1,397,955	904,812	470,423	89,700	552,224	25,231	674,168	184,837	1,778,188	467,573
1971	1,732,348	1,088,805	627,330	128,360	754,065	31,837	908,924	231,280	2,538,219	659,415
1972	2,053,269	1,307,925	777,839	175,023	971,502	42,063	1,168,970	274,599	3,371,744	865,096
1973	2,144,827	1,324,086	913,615	183,270	1,174,449	43,314	1,235,252	287,315	3,919,292	946,686
1974	2,208,364	1,383,607	934,445	192,851	1,205,307	45,049	1,268,392	292,071	3,983,075	990,064
1975	2,384,620	1,451,799	980,938	205,728	1,276,654	48,373	1,337,023	304,280	4,152,070	1,088,342
1976	2,734,908	1,447,225	1,029,259	214,714	1,352,442	51,351	1,380,405	313,685	4,292,603	1,141,598
1977	2,678,317	1,516,400	929,532	225,070	1,194,916	47,299	1,452,935	329,365	4,520,756	1,197,216
1978	2,991,808	1,601,323	1,108,296	230,643	1,465,636	47,073	1,453,820	321,681	4,458,327	1,208,719
1979	3,541,715	1,636,037	1,177,452	237,531	1,564,123	48,366	1,580,858	332,472	4,422,373	1,152,375
1980	4,101,639	1,717,829	1,271,861	259,401	1,730,656	53,349	1,702,475	360,461	4,835,652	1,269,447
1981	4,432,359	1,971,600	1,355,504	271,180	1,850,803	77,806	1,826,632	391,869	5,224,182	1,357,680
1982	3,994,781	2,063,379	1,403,332	280,313	1,936,175	55,961	2,022,388	406,891	5,410,876	1,565,182
1983	5,185,681	2,325,743	1,997,503	333,080	2,880,959	69,382	2,098,047	494,689	6,020,929	1,556,652
1984	7,221,731	3,367,523	3,084,373	445,338	4,608,046	75,773	2,327,263	553,321	7,049,450	2,331,850
1985	8,937,261	3,752,034	3,882,495	540,388	5,883,196	79,232	2,438,657	759,053	7,740,358	2,378,394
1986	8,836,333	4,319,732	4,308,841	577,474	6,571,197	102,399	2,548,576	1,000,062	7,857,569	3,047,740
1987	8,853,192	4,160,484	4,164,708	604,981	6,418,841	111,808	2,581,656	1,026,398	9,224,608	3,034,142
1988	8,328,446	4,223,889	4,163,833	615,999	6,482,143	124,667	2,636,702	779,820	9,505,259	2,828,998
1989	8,705,556	4,103,861	3,808,646	586,595	5,952,263	170,570	2,584,493	1,442,627	9,944,265	2,930,396
1990	9,994,047	4,544,356	4,487,886	620,394	7,014,185	289,349	2,782,067	1,639,829	9,795,019	3,678,107
1991	6,495,721	3,513,287	2,996,131	567,449	4,550,559	175,137	3,541,763	1,294,608	8,921,838	3,035,639
1992	8,597,490	4,470,852	3,068,617	470,165	4,667,983	121,335	4,343,561	1,129,578	8,573,361	2,980,091
1993	8,981,636	4,102,688	3,267,678	472,817	4,993,632	157,747	4,222,915	1,347,511	9,505,683	3,200,012
1994	11,168,723	4,714,481	3,313,738	554,651	5,066,159	225,809	5,216,554	1,698,990	10,209,083	4,076,706
1995	10,770,019	4,972,319	4,087,603	509,163	6,340,703	155,561	4,304,623	1,527,248	9,443,228	3,715,377
1996	11,138,946	5,160,399	7,025,782	553,231	11,183,947	150,613	4,371,994	1,867,203	9,869,330	3,807,422
1997	11,389,429	4,927,120	6,588,592	579,281	7,422,990	144,833	4,676,005	1,869,307	11,268,380	4,037,861
1998	9,908,049	4,555,587	5,663,864	546,645	5,928,447	146,074	5,712,173	1,474,029	11,192,752	3,321,115
1999	11,436,116	4,985,875	4,651,370	638,310	6,008,649	147,124	5,959,883	1,855,150	12,357,704	4,182,168
2000	10,281,887	6,725,722	2,909,682	591,354	4,156,920	115,431	5,695,221	1,419,842	11,848,747	3,203,535
2001	20,591,169	12,462,061	4,106,254	798,176	6,359,134	127,829	6,421,896	3,345,847	17,866,045	3,396,862
2002	11,944,903	9,671,813	3,359,605	759,543	5,127,291	109,735	5,549,058	2,738,141	18,771,807	3,758,221
2003	13,366,997	10,772,882	3,495,385	733,925	5,349,521	116,210	7,249,634	2,284,035	17,268,953	4,975,928
2004	14,225,573	11,832,640	4,126,973	833,462	5,387,005	125,095	7,362,119	2,522,419	21,595,103	4,414,187
2005	14,597,795	10,846,434	17,823,346	655,106	10,291,321	114,435	7,130,344	2,567,557	19,579,810	4,659,218
2006	16,099,012	10,066,290	27,410,206	636,466	9,919,672	122,774	9,856,452	2,496,524	19,337,825	4,689,512
2007	19,594,728	13,423,427	26,209,366	883,693	9,391,349	126,873	13,661,439	4,034,397	25,565,327	3,847,794
2008	17,123,479	15,342,974	25,807,290	810,486	10,332,912	135,963	12,010,687	3,958,021	25,700,347	4,816,046
2009	14,656,151	12,825,699	23,080,619	777,977	8,047,702	133,400	11,483,680	3,626,656	25,135,826	5,211,633
2010	17,549,453	12,769,990	31,937,296	694,809	11,015,355	123,018	13,978,260	3,031,011	27,845,353	6,805,309
2011	23,973,234	12,422,971	33,490,256	711,573	12,001,223	136,305	7,522,628	3,003,010	25,194,077	7,532,600
2012	21,531,078	17,343,383	39,658,744	1,181,422	16,862,604	431,522	8,536,473	4,435,809	37,134,133	7,730,672
2013	25,936,963	16,258,723	36,749,733	1,481,438	13,550,967	427,594	16,024,002	3,958,064	34,071,946	6,629,077
2014	23,303,768	15,479,110	36,138,959	1,024,705	12,998,524	430,712	18,879,617	3,906,939	32,856,836	7,288,908
2015	20,059,174	14,116,534	34,709,347	1,006,069	11,817,507	364,541	16,559,795	3,288,426	30,483,584	5,813,193
2016	21,373,524	14,519,323	36,697,966	1,041,863	12,353,159	382,592	17,784,292	3,456,528	31,266,627	5,966,220
2017	20,994,679	14,156,008	36,041,456	1,035,203	12,082,457	369,755	17,251,008	3,341,260	30,779,146	6,481,028
2018	23,012,312	14,720,492	38,250,436	1,077,839	12,972,165	405,284	18,785,754	3,674,091	32,397,347	6,896,582
2019	21,353,864	13,839,918	36,277,212	1,027,794	12,186,377	376,039	17,506,124	3,407,136	30,891,680	6,499,806
2020	22,015,643	14,021,723	36,812,529	1,026,745	12,409,997	386,870	18,217,707	3,513,095	31,168,163	6,571,624
2021	21,367,944	13,732,491	35,839,224	986,366	12,031,222	374,678	17,719,825	3,406,307	30,269,063	6,341,396
2022	21,864,532	13,759,127	35,654,190	986,333	12,110,107	383,340	18,005,938	3,487,815	30,417,974	6,383,449
2023	21,973,844	13,931,944	35,274,782	991,153	12,114,022	385,237	18,173,611	3,505,752	30,548,921	6,414,267
2024	21,346,177	13,545,059	34,403,558	974,208	11,776,132	374,180	17,633,820	3,402,905	29,927,180	6,252,139
2025	21,751,808	13,775,445	34,907,698	984,719	11,984,247	381,360	17,976,855	3,469,035	30,331,894	6,353,757
2026	20,704,945	13,421,231	33,672,260	960,259	11,493,468	362,946	17,208,370	3,298,200	29,442,664	6,118,837
2027	21,928,570	13,810,738	34,979,324	990,084	12,024,208	384,493	18,063,728	3,497,297	30,448,052	6,376,459
2028	21,949,838	13,882,717	35,016,679	993,471	12,036,297	384,877	18,120,424	3,500,473	30,502,036	6,386,952
2029	21,704,655	13,773,455	34,892,393	991,544	11,982,831	380,586	17,952,835	3,460,337	30,440,768	6,367,618
2030	21,409,124	13,623,729	34,599,686	986,983	11,859,647	375,403	17,734,434	3,411,993	30,252,015	6,314,927
2031	22,824,307	13,998,034	36,164,765	1,020,474	12,487,806	400,388	18,800,157	3,643,853	31,441,307	6,619,561
2032	21,036,863	13,368,120	34,271,332	982,065	11,719,319	368,905	17,471,702	3,352,037	30,064,501	6,258,562
2033	22,707,657	13,987,016	36,147,641	1,023,635	12,467,772	398,465	18,796,187	3,626,823	31,474,666	6,620,407
2034	20,353,291	13,309,912	33,771,310	970,643	11,503,261	357,113	17,171,060	3,245,566	29,717,516	6,158,737
2035	23,163,236	13,626,861	36,715,086	1,031,679	12,682,659	406,682	19,079,194	3,706,894	31,915,015	6,725,900
TOTAL	914,694,158	572,374,390	1,145,734,460	45,723,258	514,855,566	13,990,940	608,911,697	146,152,985	1,217,261,885	282,857,225

TABLE B-19 Total Transportation Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,120	0	0	0	0	12,626	1,627,467
1964	21,736	1,260,513	9,378	1,601,758	0	0	0	0	13,938	2,808,876
1965	21,866	2,180,589	17,766	2,717,874	0	0	405	405	28,937	4,812,829
1966	37,965	3,900,172	33,426	4,863,325	0	0	565	565	31,321	7,404,659
1967	71,283	7,693,703	68,155	9,554,331	0	0	562	562	47,718	12,836,440
1968	128,915	15,317,881	142,803	18,766,105	0	0	564	564	46,945	25,017,023
1969	198,763	23,153,063	215,209	28,327,315	0	0	3,191	3,191	52,963	36,174,118
1970	289,633	30,617,164	273,605	37,725,512	0	0	15,121	15,121	69,744	46,363,933
1971	409,327	39,958,997	342,425	49,411,332	0	0	16,001	16,001	55,532	59,011,043
1972	537,186	52,853,168	422,304	64,820,688	0	0	17,372	17,372	80,412	76,654,088
1973	587,964	57,132,802	435,655	70,328,525	0	0	17,334	17,334	54,219	81,262,956
1974	611,428	61,587,912	455,565	75,158,313	0	0	17,477	17,477	76,783	86,992,976
1975	644,621	66,557,535	478,404	80,910,385	0	0	18,406	18,406	84,547	94,154,524
1976	668,314	68,253,113	475,587	83,355,202	0	0	17,477	17,477	106,717	97,188,992
1977	696,515	66,053,753	507,063	81,349,137	0	0	18,232	18,232	98,618	95,266,358
1978	709,040	72,706,513	523,177	88,826,057	0	0	17,381	17,381	100,786	104,722,149
1979	712,866	72,440,511	526,405	89,373,085	0	0	20,579	20,579	119,352	107,072,343
1980	777,982	79,926,555	571,232	98,578,539	0	0	17,761	17,761	178,812	117,298,725
1981	806,031	91,261,393	636,404	111,463,442	0	0	21,193	21,193	185,347	132,090,705
1982	853,400	93,144,741	670,375	113,807,793	0	0	28,423	28,423	173,894	135,467,819
1983	952,131	101,787,700	803,591	126,506,087	0	0	19,276	19,276	220,926	151,964,550
1984	1,072,638	137,507,077	868,967	170,513,348	0	0	21,114	21,114	225,959	208,553,332
1985	1,120,854	173,442,297	908,769	211,862,987	0	0	20,239	20,239	340,322	258,797,028
1986	1,149,714	193,242,026	937,311	234,498,976	0	0	20,139	20,139	279,227	284,627,871
1987	1,172,016	178,764,439	908,034	221,125,306	0	0	19,742	19,742	345,116	272,881,503
1988	1,208,206	190,243,523	904,867	232,046,351	0	0	17,900	17,900	365,207	284,960,833
1989	1,194,911	193,235,260	932,599	234,592,042	0	0	19,158	19,158	422,329	288,039,679
1990	1,297,622	239,540,417	1,486,754	287,170,031	0	0	18,148	18,148	474,284	340,186,330
1991	1,354,922	179,950,983	1,141,118	217,539,155	0	0	21,018	21,018	214,683	255,929,565
1992	1,349,184	196,168,977	1,025,285	236,964,481	0	0	18,014	18,014	443,676	286,617,510
1993	1,507,551	169,493,328	1,068,134	212,440,914	0	0	20,999	20,999	599,571	271,412,515
1994	1,497,753	209,282,955	1,008,952	258,034,555	0	0	19,649	19,649	609,966	316,813,336
1995	1,520,622	173,420,264	1,061,324	221,828,053	0	0	20,277	20,277	534,971	290,538,251
1996	1,527,165	181,404,029	1,103,254	239,163,315	0	0	25,378	25,378	571,857	319,653,518
1997	1,730,348	186,736,526	1,216,560	242,587,232	0	0	24,820	24,820	428,638	323,910,478
1998	1,920,022	168,571,967	1,237,386	220,178,110	0	0	0	0	465,095	302,564,362
1999	2,170,292	191,904,156	1,266,445	247,563,242	0	0	0	0	587,326	339,525,088
2000	2,405,506	180,428,967	1,309,489	231,092,302	0	0	0	0	0	314,867,232
2001	3,321,465	374,650,802	1,617,126	455,064,666	0	0	0	0	0	557,292,352
2002	4,667,920	264,705,556	1,649,062	333,839,657	0	0	0	0	0	434,659,510
2003	5,941,691	294,189,930	1,678,101	367,423,192	0	0	20,768	20,768	0	468,226,940
2004	6,265,676	341,028,523	1,919,455	421,638,229	0	0	20,830	20,830	0	521,008,629
2005	6,526,357	313,118,930	1,400,371	409,311,024	0	0	20,827	20,827	0	520,529,064
2006	7,014,716	291,261,034	1,352,822	400,263,303	0	0	21,242	21,242	0	504,992,271
2007	7,656,235	375,469,738	1,883,901	501,748,269	0	0	21,067	21,067	0	609,693,146
2008	8,921,278	341,742,282	2,278,473	468,980,237	0	0	22,555	22,555	0	579,464,188
2009	9,055,203	299,665,837	2,063,591	415,763,973	0	0	18,691	18,691	0	517,804,308
2010	10,099,761	351,150,755	2,114,541	489,114,911	0	0	19,052	19,052	0	605,269,854
2011	10,946,032	393,273,854	2,080,273	532,288,038	0	0	20,061	20,061	0	671,321,000
2012	13,405,248	443,780,493	3,068,675	615,100,257	0	0	20,260	20,260	0	760,475,347
2013	12,141,284	417,180,823	3,295,904	587,706,517	0	0	19,218	19,218	0	729,715,180
2014	11,666,789	377,541,775	3,247,051	544,763,692	0	0	19,198	19,198	0	677,313,345
2015	11,346,193	338,324,524	2,848,366	490,737,253	0	0	18,833	18,833	0	615,592,270
2016	11,615,986	350,550,116	2,935,352	509,943,548	0	0	18,714	18,714	0	635,468,367
2017	11,433,695	341,250,993	2,841,944	498,058,632	0	0	18,759	18,759	0	622,845,716
2018	11,664,513	360,860,418	2,975,478	527,692,712	0	0	18,800	18,800	0	655,506,074
2019	11,446,367	337,255,232	2,770,075	494,837,623	0	0	16,217	16,217	0	621,695,547
2020	11,494,580	342,047,685	2,808,975	502,495,335	0	0	4,334	4,334	0	630,324,971
2021	11,373,490	331,697,407	2,733,707	487,873,120	0	0	3,553	3,553	0	616,062,516
2022	11,405,621	332,563,362	2,741,042	489,762,829	0	0	2,217	2,217	0	619,042,442
2023	11,430,590	334,947,070	2,774,255	492,465,450	0	0	2,236	2,236	0	621,925,284
2024	11,348,074	324,406,185	2,684,645	478,074,263	0	0	2,254	2,254	0	607,563,828
2025	11,411,333	330,146,759	2,733,916	486,208,826	0	0	2,271	2,271	0	616,223,416
2026	11,290,893	317,997,207	2,646,760	468,618,041	0	0	2,289	2,289	0	598,082,543
2027	11,453,394	330,911,092	2,739,935	487,607,374	0	0	2,307	2,307	0	618,596,292
2028	11,472,954	331,647,584	2,752,142	488,646,446	0	0	2,326	2,326	0	620,022,617
2029	11,476,625	329,375,502	2,724,289	485,523,436	0	0	2,344	2,344	0	617,104,406
2030	11,460,255	325,237,746	2,686,161	479,952,104	0	0	2,364	2,364	0	611,798,280
2031	11,648,453	339,159,791	2,776,900	500,985,796	0	0	2,383	2,383	0	634,376,808
2032	11,457,914	319,143,889	2,622,238	472,117,446	0	0	2,402	2,402	0	604,587,344
2033	11,679,057	337,920,224	2,768,000	499,617,551	0	0	2,423	2,423	0	633,587,502
2034	11,430,074	314,459,599	2,595,279	465,043,361	0	0	2,443	2,443	0	597,709,967
2035	11,767,954	338,237,450	2,708,532	501,766,332	0	0	2,464	2,464	0	636,219,599
TOTAL	393,673,962	16,038,713,951	113,511,112	22,008,455,587	0	0	929,617	929,617	8,751,583	27,628,251,812

TABLE B-20A Calculation of Delta Water Rates

Calculation in accordance with Article 53(i) of the Monterey Amendment

(Values in millions of dollars [\$] or millions of acre-feet [AF] discounted to 2012 at 4.610 percent per annum)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[1]		[2]		[3]	
Commencing in 2013						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$6,519.44 (b)	389.28 AF	\$5,735.60 (c)	389.28 AF	\$12,255.04	389.28 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(3,272.46)		(2,704.21)		(\$5,976.66)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2013	(2,419.09) (d)	(330.87) AF	(1,153.08)	(330.87) AF	(\$3,572.17)	(330.87) AF
TOTAL	\$827.89	58.41 AF	\$1,878.31	58.41 AF	\$2,706.21	58.41 AF
Rate Applicable in 2013	\$14.17	per acre-foot	\$32.16	per acre-foot	\$46.33	per acre-foot

Calculation under original provisions, without the Monterey Amendment

(for Plumas County, and Empire)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[4]		[5]		[6]	
Commencing in 2013						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	6,503.91 (b)	389.28 AF	5,710.45 (c)	389.28 AF	12,214.35	389.28 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(3,272.46)		(2,704.21)		(5,976.66)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2013	(2,419.09) (d)	(330.87) AF	(1,153.08)	(330.87) AF	(3,572.17)	(330.87) AF
TOTAL	812.36	58.41 AF	1,853.16	58.41 AF	2,665.52	58.41 AF
Rate Applicable in 2013	\$13.91	per acre-foot	\$31.73	per acre-foot	\$45.63	per acre-foot

- (a) Considering that all operating costs of Project Conservation Facilities will not vary with annual amounts of Project water delivered, and therefore are properly classified as "Minimum" OMP&R Costs. OMP&R costs exclude amounts for Conservation RAS.
- (b) Including net credits of \$4,850,000 for settlements as to the magnitude of Project Capital costs incurred prior to December 31, 1960, and net credits of \$6,678,320 for settlement as to the magnitude of Project Capital costs incurred during the 1961 through 1978 period.
- (c) Includes conservation power costs and credits at San Luis.
- (d) Applying all Delta Water Charges paid prior to 1970 to reimburse Capital costs (the charge was not divided into components until 1970).

TABLE B-20B Delta Water Rates by Facility

(in dollars per acre-foot)

Item	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component	Total Delta Water Rate
	[1]	[2]	[3]
Initial Conservation Facilities			
Oroville Division			
Water Supply and power costs (a)	66.67	44.02	110.69
Less, Oroville Power Revenues	<u>-39.66</u>	<u>-19.74</u>	<u>-59.40</u>
Subtotal	27.01	24.28	51.29
Delta Facilities (b)			
California Aqueduct, portion			
Reach 1	4.27	7.47	11.74
Reach 2A	2.49	0.96	3.44
Reach 2B	1.30	0.67	1.97
Reach 3	<u>0.89</u>	<u>0.38</u>	<u>1.28</u>
Subtotal	8.95	9.48	18.43
San Luis Facilities			
Planning and preoperating costs through 2011	3.67	0.00	3.67
45,000 AF relinquished costs	0.27	0.43	0.70
Less, Capital Cost Credits	-1.75	0.00	-1.75
Less, Delta Water Charges paid prior to 2013	<u>-56.02</u>	<u>-46.29</u>	<u>-102.32</u>
Rate applicable in 2013	14.17	32.16	46.33

(a) Includes revenue received from non-SWP contractors.

(b) Includes 1. Delta Facility planning costs, 2. Delta Studies costs, and 3. Suisun Marsh Facilities Costs.

TABLE B-21 Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	14,000	50,050	177,100	241,150	0	0	0
1968	0	0	0	19,156	29,701	193,245	242,102	0	0	0
1969	0	0	0	30,324	44,096	215,483	289,903	0	0	0
1970	0	0	0	80,908	107,730	585,200	773,838	0	0	0
1971	0	0	0	57,320	123,080	637,120	817,520	0	0	0
1972	0	0	0	99,668	143,877	707,328	950,873	0	0	0
1973	0	0	0	120,880	167,099	782,167	1,070,146	0	0	0
1974	0	0	0	137,684	182,339	818,664	1,138,687	0	0	0
1975	0	0	0	146,204	187,324	804,123	1,137,651	0	0	0
1976	0	0	0	168,489	208,652	862,036	1,239,177	0	0	0
1977	0	0	0	172,931	208,645	827,062	1,208,638	0	0	0
1978	0	0	0	206,378	243,231	926,594	1,376,203	0	0	0
1979	0	0	0	237,771	273,208	1,005,955	1,516,934	0	0	0
1980	0	18,325	18,325	272,717	307,426	1,090,867	1,671,010	12,396	3,479	15,875
1981	0	25,440	25,440	415,564	469,788	1,589,984	2,475,316	18,068	10,414	28,482
1982	0	34,917	34,917	457,988	519,053	1,679,289	2,656,330	38,166	99,788	137,954
1983	0	12,035	12,035	316,703	359,775	1,114,795	1,791,273	38,004	68,902	106,906
1984	0	22,453	22,453	334,587	380,914	1,132,448	1,847,949	57,909	105,498	163,407
1985	0	22,001	22,001	381,970	435,728	1,244,939	2,062,637	106,103	192,937	299,040
1986	35,358	21,767	57,125	423,378	485,372	1,330,615	2,239,365	151,206	275,347	426,553
1987	0	22,984	22,984	430,024	493,786	1,304,900	2,228,710	185,355	336,664	522,019
1988	88,878	150,466	239,344	464,114	533,731	1,361,400	2,359,245	239,792	436,607	676,399
1989	102,688	305,328	408,016	513,853	591,760	1,491,833	2,597,446	331,518	602,402	933,920
1990	112,723	355,132	467,855	534,787	616,676	1,537,512	2,688,975	417,802	760,166	1,177,968
1991	129,296	395,515	524,811	603,028	681,067	1,667,194	2,951,289	443,403	806,745	1,250,148
1992	158,879	489,808	648,687	729,545	808,579	1,945,453	3,483,577	506,628	921,780	1,428,408
1993	172,457	530,778	703,235	771,894	840,958	1,990,673	3,603,525	507,825	923,957	1,431,782
1994	177,824	546,610	724,434	778,647	817,579	1,946,615	3,542,841	486,654	885,437	1,372,091
1995	203,738	713,997	917,235	874,946	874,946	2,083,205	3,833,097	520,801	947,567	1,468,368
1996	213,506	774,152	987,658	901,129	860,168	2,048,020	3,809,317	512,005	931,562	1,443,567
1997	250,558	866,141	1,116,699	1,041,633	951,056	2,264,420	4,257,109	566,105	1,029,994	1,596,099
1998	266,952	882,469	1,149,421	1,048,658	957,470	2,279,691	4,285,819	141,683	888,760	1,030,443
1999	290,688	923,459	1,214,147	1,084,480	990,178	2,357,566	4,432,224	589,391	1,072,362	1,661,753
2000	390,936	948,784	1,339,720	1,628,402	1,005,778	2,394,709	5,028,889	598,677	1,089,257	1,687,934
2001	496,412	1,097,880	1,594,292	1,868,283	1,005,998	2,395,234	5,269,515	598,809	1,089,496	1,688,305
2002	512,928	1,125,429	1,638,357	1,896,134	1,020,996	2,430,942	5,348,072	607,736	1,105,738	1,713,474
2003	511,059	1,112,692	1,623,751	1,856,239	999,510	2,379,785	5,235,527	594,946	1,082,469	1,677,415
2004	569,615	1,230,627	1,800,242	2,033,406	1,094,911	2,606,931	5,735,248	651,732	1,185,788	1,837,520
2005	573,729	1,219,893	1,793,622	2,081,144	1,084,212	2,581,456	5,746,812	645,364	1,174,201	1,819,565
2006	606,343	1,272,001	1,878,344	2,167,748	1,129,330	2,688,880	5,985,958	672,220	1,223,064	1,895,284
2007	623,728	1,291,247	1,914,975	2,198,222	1,145,206	2,726,679	6,070,107	681,671	1,240,257	1,921,928
2008	647,090	1,322,240	1,969,330	2,248,611	1,171,457	2,789,182	6,209,250	697,296	1,268,687	1,965,983
2009	717,087	1,446,549	2,163,636	2,457,420	1,280,240	3,048,190	6,785,850	762,047	1,386,499	2,148,546
2010	1,105,529	1,809,450	2,914,979	2,407,686	1,599,732	3,808,886	8,479,304	952,222	1,732,510	2,684,732
2011	1,216,921	1,993,865	3,210,786	3,380,086	1,760,920	4,192,667	9,333,673	1,048,167	1,907,076	2,955,243
2012	1,270,523	2,083,876	3,354,399	3,528,967	1,838,483	4,377,340	9,744,790	1,094,335	1,991,077	3,085,412
2013	1,344,704	2,207,862	3,552,566	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2014	1,344,704	2,210,178	3,554,882	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2015	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2016	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2017	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2018	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2019	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2020	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2021	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2022	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2023	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2024	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2025	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2026	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2027	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2028	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2029	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2030	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2031	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2032	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2033	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2034	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
2035	1,344,704	2,212,495	3,557,199	3,735,010	1,945,824	4,632,915	10,313,749	1,158,229	2,107,328	3,265,557
TOTAL	42,373,637	75,948,245	118,321,882	130,191,929	75,835,747	186,981,422	393,009,098	42,115,303	77,245,031	119,360,334

TABLE B-21 Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	40,695	10,469	0	0	165,522	3,177	8,073	98,608	326,544
1969	61,267	3,281	0	0	337,686	4,200	8,805	102,478	517,717
1970	104,405	19,950	0	0	964,915	8,645	17,290	228,095	1,343,300
1971	129,596	21,720	0	0	1,377,772	9,412	20,272	264,260	1,823,032
1972	160,756	24,113	0	0	2,175,835	11,253	43,131	905,057	3,320,145
1973	195,541	26,664	0	386,638	2,373,167	13,333	27,553	373,307	3,396,203
1974	224,202	27,909	0	446,545	2,781,595	13,954	29,770	445,138	3,969,113
1975	329,688	27,413	0	481,560	3,041,048	14,620	33,702	827,591	4,755,622
1976	414,245	29,388	0	549,549	3,931,785	15,673	35,966	877,151	5,853,757
1977	312,532	28,195	0	569,545	4,071,218	15,977	40,289	626,210	5,663,966
1978	342,208	31,588	0	674,939	4,950,959	20,006	41,065	666,516	6,727,281
1979	395,523	34,294	0	772,757	5,901,986	22,863	45,725	771,613	7,944,761
1980	555,341	37,679	0	881,371	6,984,026	27,272	70,658	933,481	9,489,828
1981	740,789	54,204	0	1,351,487	11,140,730	41,556	77,692	1,373,168	14,779,626
1982	762,396	57,248	0	1,518,993	12,703,436	47,707	85,873	1,530,443	16,726,096
1983	543,462	38,004	0	1,057,789	9,141,315	35,471	58,273	78,506	10,952,820
1984	580,379	13,572	0	1,333,200	9,741,623	39,893	61,770	756,132	12,526,569
1985	667,740	42,441	0	1,540,611	11,403,920	48,100	69,320	644,383	14,416,515
1986	745,447	45,362	0	1,714,679	12,925,113	55,946	77,115	1,469,725	17,033,387
1987	762,180	44,485	0	1,766,065	13,410,817	59,314	77,108	1,503,601	17,623,570
1988	827,669	46,411	0	1,916,790	14,707,763	61,882	83,540	1,633,680	19,277,735
1989	921,621	49,728	0	2,125,033	16,312,361	66,304	92,825	1,821,693	21,389,565
1990	964,288	50,136	0	1,998,766	17,276,959	66,848	95,259	1,980,383	22,432,639
1991	1,023,374	53,208	0	2,121,239	18,335,590	70,944	101,096	2,101,729	23,807,180
1992	1,169,299	60,795	0	2,727,688	20,646,125	81,061	115,511	2,401,419	27,201,898
1993	1,172,060	60,939	0	2,734,129	20,694,874	81,252	115,784	2,407,089	27,266,127
1994	1,123,198	58,398	0	2,156,809	20,295,455	77,865	110,957	2,306,739	26,129,421
1995	1,202,009	62,497	0	2,803,995	21,223,694	83,328	118,743	2,468,598	27,962,864
1996	534,818	69,191	0	2,756,635	19,492,814	81,921	102,219	2,426,904	25,464,502
1997	1,208,521	67,162	0	3,047,908	22,148,973	90,576	129,072	2,683,338	29,375,550
1998	1,216,671	77,807	0	2,726,511	22,070,376	91,188	129,942	2,820,148	29,132,643
1999	1,258,233	69,974	0	2,819,648	22,824,299	94,303	134,381	2,793,715	29,994,553
2000	1,278,056	70,943	0	3,223,279	21,220,235	95,788	136,498	2,837,730	28,862,529
2001	1,278,336	71,058	0	2,864,700	21,110,372	95,809	136,528	2,838,352	28,395,155
2002	1,393,975	72,121	0	3,272,056	21,060,431	97,237	138,564	2,711,156	28,745,540
2003	1,364,640	70,550	0	3,203,191	20,617,243	95,192	135,648	2,654,103	28,140,567
2004	1,494,892	77,810	0	3,508,929	22,585,122	104,277	148,595	2,897,005	30,816,630
2005	1,480,284	77,153	0	3,474,640	22,307,136	232,331	147,143	2,739,621	30,458,308
2006	1,541,884	80,380	0	3,619,232	23,235,418	242,000	153,266	2,587,428	31,459,608
2007	1,563,559	81,479	0	3,670,110	23,562,051	253,717	155,421	2,615,486	31,901,823
2008	1,599,401	83,191	0	3,754,239	24,102,160	259,533	158,983	2,675,439	32,632,946
2009	1,747,923	90,846	0	4,102,863	26,340,321	283,634	173,747	2,923,885	35,663,219
2010	1,917,507	113,466	0	5,126,760	32,304,300	354,417	217,107	3,386,937	43,420,494
2011	2,110,714	123,965	0	5,643,329	35,559,263	390,128	238,982	3,728,203	47,794,584
2012	2,203,684	129,358	0	5,891,899	37,125,530	407,311	249,508	3,892,418	49,899,708
2013	2,332,348	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,813,142
2014	2,332,348	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,813,142
2015	2,193,361	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,674,155
2016	2,193,361	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,674,155
2017	2,193,361	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,674,155
2018	2,193,361	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,674,155
2019	2,193,361	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,674,155
2020	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2021	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2022	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2023	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2024	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2025	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2026	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2027	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2028	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2029	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2030	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2031	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2032	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2033	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2034	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
2035	2,008,044	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,488,838
TOTAL	89,445,213	5,635,199	0	239,761,898	1,590,425,599	14,282,357	10,522,517	175,561,324	2,125,634,107

TABLE B-21 Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	13,060	0	0	0	0	0	0	0	0
1969	0	17,804	0	0	0	0	0	0	0	0
1970	0	37,905	0	0	0	0	0	0	0	0
1971	0	48,508	0	0	0	0	0	0	0	0
1972	160,756	74,751	41,797	4,662	64,303	1,367	67,518	13,021	369,739	85,202
1973	222,207	107,163	51,552	7,279	79,994	2,577	95,104	26,131	54,908	14,338
1974	279,090	143,266	59,539	10,791	93,030	3,721	121,869	39,631	465,150	114,427
1975	319,822	166,307	63,964	13,250	100,515	4,752	140,722	50,989	479,733	119,705
1976	431,018	207,673	74,449	17,045	117,550	6,269	174,366	67,591	538,772	137,142
1977	469,922	226,502	79,144	19,079	122,180	6,861	189,848	77,255	540,410	139,097
1978	600,180	274,819	97,313	24,428	147,413	9,687	236,913	98,345	631,768	165,313
1979	720,173	320,077	115,033	29,836	171,470	11,889	284,640	117,285	714,457	189,760
1980	857,818	376,845	134,920	35,949	210,736	14,256	337,177	138,590	811,952	215,694
1981	1,355,100	592,631	218,713	57,637	343,292	22,946	534,813	211,396	1,237,658	330,644
1982	1,551,434	664,082	254,298	66,408	400,739	26,335	613,057	235,100	1,341,923	364,482
1983	1,110,994	472,521	184,283	47,759	291,367	19,002	434,517	163,925	943,775	252,096
1984	450,405	509,602	202,914	52,247	321,718	20,719	472,282	174,500	1,003,760	266,383
1985	565,881	591,346	240,344	61,540	381,970	24,474	551,734	200,605	1,152,983	308,405
1986	635,066	659,259	275,347	70,160	438,498	27,822	625,994	223,785	1,285,253	350,799
1987	652,450	676,176	288,131	73,104	467,095	29,064	648,002	228,654	1,319,729	364,779
1988	711,641	742,582	319,496	80,756	525,996	32,024	711,641	248,146	1,438,752	402,232
1989	2,083,593	830,453	362,565	91,333	605,021	36,301	803,932	276,155	1,607,864	454,180
1990	2,207,667	869,029	386,049	96,930	636,731	38,438	848,974	289,119	1,696,277	481,308
1991	2,454,678	961,298	409,704	102,869	675,746	40,793	900,994	306,835	1,819,725	510,800
1992	2,804,695	1,098,371	468,125	117,538	772,102	46,610	1,029,469	350,587	2,079,203	583,636
1993	2,811,318	1,100,964	469,230	117,815	773,925	46,720	1,031,900	351,415	2,084,113	585,014
1994	2,694,116	1,055,065	449,668	112,905	741,661	44,772	988,880	336,766	1,997,227	560,625
1995	2,883,156	1,129,097	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963
1996	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1997	3,133,957	1,227,316	523,081	131,336	862,744	52,082	1,150,325	391,745	2,323,295	652,153
1998	3,155,093	1,235,093	526,609	132,222	868,562	52,433	1,128,006	394,387	2,338,963	656,551
1999	3,262,870	1,277,800	544,598	136,739	898,233	54,224	1,178,034	407,859	2,418,863	678,979
2000	3,314,278	1,279,763	553,178	138,893	912,384	55,078	1,185,190	410,073	2,456,972	689,676
2001	3,315,004	2,280,263	553,299	138,924	912,584	55,090	1,815,587	510,185	2,457,510	689,827
2002	3,437,351	2,314,256	561,548	140,995	926,188	55,912	1,842,654	517,791	2,494,146	700,112
2003	3,365,016	2,265,555	549,731	138,028	906,698	54,735	1,803,877	506,894	2,441,659	685,379
2004	3,686,201	2,481,798	602,201	151,202	993,241	59,960	1,976,053	555,277	2,674,711	750,797
2005	3,650,179	2,457,547	596,316	149,725	983,535	59,374	1,956,744	549,850	2,648,574	743,459
2006	3,802,076	2,559,814	3,256,234	155,955	1,344,440	61,844	2,038,171	572,732	2,758,791	774,397
2007	3,855,524	2,595,798	3,302,008	158,148	1,363,339	62,714	2,066,822	580,783	2,797,573	785,284
2008	3,943,904	2,655,301	3,377,700	161,773	1,394,591	64,151	2,114,200	594,096	2,861,701	803,284
2009	4,310,140	2,901,877	3,691,358	176,795	1,524,095	70,109	2,310,528	649,264	3,127,443	877,878
2010	5,385,764	3,626,059	5,269,593	220,916	2,123,453	87,605	3,153,757	811,293	3,907,916	1,096,959
2011	5,928,431	3,991,419	5,800,554	243,175	2,337,412	96,431	3,471,528	893,038	4,301,676	1,207,488
2012	6,189,558	4,167,227	6,056,049	253,886	2,440,367	100,679	3,624,437	932,373	4,491,150	1,260,674
2013	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,836,054	986,811	4,753,371	1,334,280
2014	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,836,054	986,811	4,753,371	1,334,280
2015	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,975,041	986,811	4,753,371	1,334,280
2016	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,975,041	986,811	4,753,371	1,334,280
2017	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,975,041	986,811	4,753,371	1,334,280
2018	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,975,041	986,811	4,753,371	1,334,280
2019	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,975,041	986,811	4,753,371	1,334,280
2020	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2021	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2022	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2023	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2024	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2025	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2026	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2027	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2028	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2029	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2030	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2031	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2032	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2033	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2034	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
2035	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	4,160,358	986,811	4,753,371	1,334,280
TOTAL	246,274,652	156,836,874	189,386,622	10,359,950	90,254,466	4,105,649	142,410,963	37,014,820	185,682,245	51,927,191

TABLE B-21 Total Delta Water Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	241,150
1968	0	0	0	13,060	0	1,050	875	1,925	0	583,631
1969	0	0	0	17,804	0	1,225	929	2,154	0	827,578
1970	0	0	0	37,905	0	3,848	1,995	5,843	0	2,160,886
1971	0	0	0	48,508	0	4,546	3,186	7,732	0	2,696,792
1972	0	2,043,211	0	2,926,327	0	4,929	3,778	8,707	0	7,206,052
1973	0	2,317,893	0	2,979,146	0	7,059	4,444	11,503	0	7,456,998
1974	0	4,231,933	0	5,562,447	0	8,336	4,931	13,267	0	10,683,514
1975	0	5,073,286	0	6,533,045	0	9,416	5,117	14,533	0	12,440,851
1976	0	6,422,167	0	8,194,042	0	7,004	5,780	12,784	0	15,299,760
1977	0	7,104,278	0	8,974,576	0	16,917	5,827	22,744	0	15,869,924
1978	0	9,016,389	0	11,302,568	0	12,635	6,844	19,479	0	19,425,531
1979	0	10,935,192	0	13,609,812	0	16,575	7,773	24,348	0	23,095,855
1980	84,294	13,102,796	12,396	16,333,423	0	19,834	8,801	28,635	0	27,557,096
1981	140,930	20,910,099	36,136	25,991,995	0	21,682	13,370	35,052	0	43,335,911
1982	167,929	23,998,560	57,248	29,441,595	0	16,117	14,694	30,811	0	49,027,703
1983	124,148	17,203,307	50,672	21,298,366	0	15,202	10,134	25,336	0	34,186,736
1984	138,982	18,766,458	64,344	22,444,314	20,590	15,442	10,681	46,713	0	37,051,405
1985	166,935	22,050,974	84,882	26,382,073	24,050	16,976	12,166	53,192	0	43,235,458
1986	195,056	25,089,658	120,965	29,997,662	31,753	18,145	13,457	63,355	0	49,817,447
1987	207,598	26,095,043	148,284	31,198,109	37,071	17,794	13,642	68,507	0	51,663,899
1988	233,604	28,781,238	201,116	34,429,224	46,722	18,565	14,852	80,139	0	57,062,086
1989	268,530	32,505,376	265,215	40,190,518	61,184	19,891	16,576	97,651	0	65,617,116
1990	289,119	33,616,369	334,242	41,790,252	63,506	20,055	17,381	100,942	0	68,658,631
1991	306,835	35,676,185	354,722	44,521,184	170,267	21,283	19,155	210,705	0	73,265,317
1992	350,587	40,763,329	405,303	50,869,555	194,545	24,318	22,697	241,560	0	83,873,685
1993	351,415	40,859,579	406,260	50,989,668	195,005	24,376	23,563	242,944	0	84,237,281
1994	336,766	39,156,173	389,323	48,863,947	186,875	23,360	23,360	233,595	0	80,866,329
1995	360,394	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	0	41,195,923	409,604	51,055,092	196,610	24,576	26,624	247,810	0	83,007,946
1997	0	45,548,810	447,746	56,444,590	214,918	27,173	30,223	272,314	0	93,062,361
1998	0	45,855,992	450,529	57,394,940	107,459	27,356	31,537	166,352	0	93,159,618
1999	47,152	47,422,430	466,491	59,403,272	226,327	28,291	33,820	288,438	0	96,994,387
2000	71,841	48,169,576	478,942	61,445,844	229,892	69,207	35,708	334,807	0	98,699,723
2001	95,809	48,180,135	479,047	61,483,264	229,942	83,833	37,187	350,962	0	98,781,493
2002	97,237	48,898,394	486,188	62,472,772	233,371	85,083	39,185	357,639	0	100,275,854
2003	118,989	47,869,376	475,957	61,181,894	228,460	83,293	39,743	351,496	0	98,210,650
2004	156,416	52,438,419	521,386	67,047,662	250,266	92,048	0	342,314	0	107,579,616
2005	167,795	51,925,988	516,291	66,405,377	247,820	717,290	0	965,110	0	107,188,794
2006	188,222	51,397,939	537,776	69,448,391	258,133	32,606	8,699	299,438	0	110,967,023
2007	204,501	52,120,469	545,336	70,438,299	268,738	33,950	19,600	322,288	0	112,569,420
2008	482,528	53,315,217	557,836	72,326,282	274,736	794,785	56,138	1,125,659	0	116,229,450
2009	527,337	58,266,144	609,638	79,042,606	292,626	844,842	63,417	1,200,885	0	127,004,742
2010	658,937	72,806,845	761,778	99,910,875	365,653	1,054,033	81,825	1,501,511	0	158,911,895
2011	725,331	80,142,822	838,533	109,977,838	414,001	1,185,940	92,561	1,692,502	0	174,964,626
2012	757,280	83,672,846	875,468	114,821,994	424,826	1,216,951	100,037	1,741,814	0	182,648,117
2013	801,494	88,558,169	926,583	121,525,993	444,760	1,274,052	109,975	1,828,787	0	193,299,794
2014	801,494	88,558,169	926,583	121,525,993	444,760	1,274,052	114,082	1,832,894	0	193,306,217
2015	801,494	88,558,169	926,583	121,664,980	444,760	1,274,052	118,645	1,837,457	0	193,313,097
2016	801,494	88,558,169	926,583	121,664,980	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2017	801,494	88,558,169	926,583	121,664,980	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2018	801,494	88,558,169	926,583	121,664,980	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2019	801,494	88,558,169	926,583	121,664,980	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2020	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2021	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2022	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2023	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2024	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2025	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2026	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2027	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2028	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2029	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2030	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2031	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2032	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2033	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2034	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
2035	801,494	88,558,169	926,583	121,850,297	444,760	1,274,052	123,208	1,842,020	0	193,317,660
TOTAL	26,456,859	3,473,688,379	34,117,704	4,648,516,374	15,924,813	36,116,032	3,815,214	55,856,059	0	7,460,697,854

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County	Santa Barbara County	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	29,131	40,505	69,636	25,436	30,176	100,035	155,647	13,126	24,392	37,518
1989	48,804	69,621	118,425	43,343	51,681	170,303	265,327	26,828	49,634	76,462
1990	41,166	60,482	101,648	38,407	51,185	149,440	239,032	27,956	51,795	79,751
1991	63,389	92,401	155,790	62,470	81,991	235,712	380,173	44,887	83,709	128,596
1992	84,320	126,227	210,547	89,247	115,208	325,629	530,084	61,137	113,925	175,062
1993	90,152	137,473	227,625	98,432	125,174	347,457	571,063	67,725	126,662	194,387
1994	91,785	141,222	233,007	102,021	126,216	352,415	580,652	81,420	159,156	240,576
1995	108,311	181,787	290,098	126,000	149,378	416,955	692,333	131,674	270,727	402,401
1996	132,304	232,343	364,647	158,514	180,787	505,043	844,344	242,654	534,448	777,102
1997	135,556	237,492	373,048	171,263	187,162	522,127	880,552	141,810	846,616	988,426
1998	130,346	228,366	358,712	164,682	179,971	502,065	846,718	136,361	814,087	950,448
1999	182,507	316,416	498,923	227,072	248,031	691,830	1,166,933	188,835	1,124,110	1,312,945
2000	238,571	364,418	602,989	260,766	284,875	794,730	1,340,371	218,359	1,364,019	1,582,378
2001	234,773	358,616	593,389	561,965	280,341	782,078	1,624,384	214,883	1,342,304	1,557,187
2002	257,520	391,851	649,371	610,230	288,977	806,174	1,705,381	221,503	1,383,661	1,605,164
2003	268,151	408,027	676,178	635,422	300,907	839,455	1,775,784	230,647	1,440,782	1,671,429
2004	268,425	408,444	676,869	636,070	301,214	840,312	1,777,596	230,883	1,442,252	1,673,135
2005	253,413	385,602	639,015	610,756	284,369	793,318	1,688,443	217,970	1,361,594	1,579,564
2006	274,219	417,261	691,480	660,900	307,716	858,451	1,827,067	235,866	1,473,385	1,709,251
2007	177,891	270,066	447,957	441,730	197,505	550,975	1,190,210	152,478	975,872	1,128,350
2008	254,590	386,862	641,452	773,686	288,283	803,089	1,865,058	223,659	1,369,892	1,593,551
2009	285,324	434,158	719,482	687,665	320,178	893,215	1,901,058	245,418	1,533,052	1,778,470
2010	273,015	415,428	688,443	657,998	306,365	854,681	1,819,044	234,831	1,466,914	1,701,745
2011	294,866	448,677	743,543	710,662	330,884	923,085	1,964,631	253,625	1,584,318	1,837,943
2012	650,644	774,442	1,425,086	1,279,346	561,077	1,584,692	3,425,115	389,462	2,472,960	2,862,422
2013	704,880	839,439	1,544,319	1,389,005	609,731	1,716,367	3,715,103	422,721	2,682,014	3,104,735
2014	745,633	887,972	1,633,605	1,469,311	644,983	1,815,600	3,929,894	447,161	2,837,077	3,284,238
2015	783,637	933,230	1,716,867	1,544,200	677,857	1,908,138	4,130,195	469,952	2,871,678	3,451,630
2016	787,346	937,647	1,724,993	1,551,509	681,065	1,917,170	4,149,744	472,176	2,995,790	3,467,966
2017	776,423	924,640	1,701,063	1,529,985	671,617	1,890,573	4,092,175	465,626	2,954,230	3,419,856
2018	697,336	830,455	1,527,791	1,374,140	603,206	1,697,998	3,675,344	418,197	2,653,311	3,071,508
2019	735,600	876,023	1,611,623	1,449,540	636,304	1,791,169	3,877,013	441,144	2,798,900	3,240,044
2020	693,167	825,490	1,518,657	1,365,924	599,599	1,687,846	3,653,369	415,697	2,637,447	3,053,144
2021	690,630	822,468	1,513,098	1,360,924	597,404	1,681,668	3,639,996	414,175	2,627,793	3,041,968
2022	666,264	793,452	1,459,716	1,312,911	576,328	1,622,339	3,511,578	399,563	2,535,084	2,934,647
2023	667,592	795,033	1,462,625	1,315,528	577,477	1,625,573	3,518,578	400,359	2,540,138	2,940,497
2024	648,149	771,879	1,420,028	1,277,214	560,658	1,578,229	3,416,101	388,699	2,466,159	2,854,858
2025	592,633	705,765	1,298,398	1,167,817	512,636	1,443,049	3,123,502	355,406	2,254,924	2,610,330
2026	555,062	661,022	1,216,084	1,093,781	480,137	1,351,565	2,925,483	332,874	2,111,970	2,444,844
2027	606,481	722,256	1,328,737	1,195,105	524,615	1,476,768	3,196,488	363,711	2,307,614	2,671,325
2028	474,823	565,465	1,040,288	935,666	410,729	1,156,184	2,502,579	284,755	1,806,666	2,091,421
2029	511,986	609,722	1,121,708	1,008,897	442,875	1,246,675	2,698,447	307,041	1,948,068	2,255,109
2030	42,834	51,011	93,845	84,407	37,052	104,300	225,759	25,688	162,980	188,668
2031	42,943	51,141	94,084	84,622	37,147	104,566	226,335	25,753	163,396	189,149
2032	42,893	51,081	93,974	84,522	37,103	104,442	226,067	25,723	163,203	188,926
2033	42,939	51,136	94,075	84,613	37,143	104,555	226,311	25,751	163,379	189,130
2034	42,891	51,079	93,970	84,519	37,101	104,438	226,058	25,722	163,197	188,919
2035	42,907	51,098	94,005	84,552	37,116	104,479	226,147	25,732	163,260	188,992
TOTAL	16,464,222	21,136,691	37,600,913	32,682,775	15,609,534	43,876,957	92,169,266	11,187,623	67,528,544	78,716,167

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	33,986	1,657	0	67,288	726,501	2,228	2,851	66,748	901,259
1989	59,273	2,785	0	116,689	1,251,452	3,733	4,927	116,736	1,555,595
1990	53,349	2,419	0	287,811	947,351	3,248	4,367	109,118	1,407,663
1991	82,252	3,731	0	359,380	1,564,983	5,035	6,771	168,217	2,190,369
1992	112,566	5,127	0	452,691	2,153,423	6,927	9,285	230,217	2,970,236
1993	119,670	5,459	0	272,449	2,491,672	7,381	9,894	244,813	3,151,338
1994	118,265	5,379	0	244,671	2,485,820	7,300	9,766	241,933	3,113,134
1995	139,227	6,339	0	317,885	2,894,182	8,598	11,490	284,798	3,662,519
1996	169,333	7,703	0	354,341	2,722,241	10,460	13,978	346,366	3,624,422
1997	165,364	7,980	0	366,285	2,673,847	10,826	14,465	357,986	3,596,753
1998	159,011	7,672	0	352,211	2,571,110	10,410	13,909	344,232	3,458,555
1999	218,784	10,373	0	485,897	3,371,115	14,376	19,166	476,017	4,595,728
2000	251,339	11,735	0	557,296	3,620,348	16,500	21,990	546,406	5,025,614
2001	247,338	11,547	0	548,424	3,461,158	16,238	21,640	537,707	4,844,052
2002	273,542	11,904	0	565,321	3,496,023	16,737	22,306	521,659	4,907,492
2003	284,834	12,395	0	588,659	3,640,346	17,428	23,227	543,193	5,110,082
2004	285,125	12,408	0	589,259	3,644,059	17,446	23,251	543,748	5,115,296
2005	269,179	11,714	0	556,305	3,431,851	39,485	21,951	488,483	4,818,968
2006	291,279	12,676	0	601,979	3,713,614	42,726	23,753	528,589	5,214,616
2007	187,144	8,113	0	383,463	2,314,841	34,088	15,230	285,915	3,228,794
2008	271,383	11,832	0	563,171	3,478,837	41,080	22,094	445,805	4,834,202
2009	303,076	13,189	0	626,357	3,864,004	46,037	24,715	497,108	5,374,486
2010	257,209	12,620	0	599,335	3,631,924	44,051	23,648	440,950	5,009,737
2011	277,794	13,630	0	647,304	3,922,606	47,577	25,542	476,242	5,410,695
2012	460,593	21,585	0	1,131,967	9,257,111	68,149	40,700	867,581	11,847,686
2013	484,429	23,395	0	1,226,390	9,620,630	73,823	44,101	882,509	12,355,277
2014	512,437	24,748	0	1,297,295	10,176,854	78,091	46,651	933,532	13,069,608
2015	538,555	26,009	0	1,363,416	10,695,553	82,071	49,028	981,113	13,735,745
2016	541,104	26,132	0	1,369,869	10,746,175	82,460	49,261	985,756	13,800,757
2017	533,597	25,770	0	1,350,865	10,597,095	81,316	48,577	972,081	13,609,301
2018	479,245	23,145	0	1,213,265	9,517,670	73,033	43,629	873,064	12,223,051
2019	505,541	24,415	0	1,279,838	10,039,911	77,040	46,023	920,970	12,893,738
2020	476,379	23,006	0	1,206,011	9,460,763	72,596	43,368	867,844	12,149,967
2021	474,636	22,922	0	1,201,597	9,426,135	72,331	43,209	864,668	12,105,498
2022	457,890	22,113	0	1,159,204	9,093,580	69,779	41,685	834,162	11,678,413
2023	458,803	22,157	0	1,161,515	9,111,706	69,918	41,768	835,825	11,701,692
2024	445,441	21,512	0	1,127,687	8,846,337	67,882	40,552	811,482	11,360,893
2025	407,287	19,670	0	1,031,097	8,088,619	62,067	37,078	741,976	10,387,794
2026	381,467	18,423	0	965,729	7,575,829	58,132	34,728	694,938	9,729,246
2027	416,804	20,129	0	1,055,190	8,277,623	63,518	37,945	759,314	10,630,523
2028	326,322	15,759	0	826,124	6,480,676	49,729	29,707	594,478	8,322,795
2029	351,863	16,993	0	890,782	6,987,897	53,621	32,033	641,006	8,974,195
2030	29,438	1,422	0	74,525	584,626	4,486	2,680	53,628	750,805
2031	29,513	1,425	0	74,715	586,118	4,498	2,687	53,765	752,721
2032	29,478	1,424	0	74,627	585,423	4,492	2,684	53,701	751,829
2033	29,510	1,425	0	74,707	586,055	4,497	2,686	53,759	752,639
2034	29,477	1,424	0	74,624	585,402	4,492	2,683	53,699	751,801
2035	29,488	1,424	0	74,653	585,627	4,494	2,685	53,720	752,091
TOTAL	13,059,619	616,814	0	31,810,163	235,586,723	1,752,430	1,156,364	24,227,557	308,209,670

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	64,266	57,111	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907
1989	205,668	98,720	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104
1990	185,010	87,808	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851
1991	296,854	140,371	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172
1992	402,015	234,421	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372
1993	424,871	247,076	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298
1994	424,023	247,222	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422
1995	500,083	290,999	111,729	31,823	184,169	8,769	229,530	64,852	623,848	165,594
1996	606,387	353,131	135,428	38,635	223,236	10,640	278,178	78,696	760,333	201,821
1997	626,151	362,776	139,565	39,802	230,058	10,972	286,779	81,146	808,482	207,472
1998	602,091	348,838	134,202	38,273	221,218	10,550	275,761	78,028	777,418	199,501
1999	826,108	479,470	184,524	52,650	304,166	14,475	642,815	107,060	1,041,566	277,200
2000	940,325	1,150,965	210,453	60,212	346,906	16,486	736,157	121,898	1,191,538	316,860
2001	925,355	1,132,642	207,102	59,254	341,384	16,224	724,438	135,581	1,172,568	311,816
2002	974,814	1,167,539	213,483	61,079	351,902	16,724	746,758	139,071	1,208,696	321,423
2003	1,015,056	1,215,738	222,296	63,601	366,429	17,415	777,586	144,812	1,258,593	334,692
2004	1,016,092	1,216,978	222,523	63,666	366,803	17,432	778,379	144,960	1,259,877	335,033
2005	959,268	1,148,920	210,078	60,105	346,290	16,457	734,849	136,853	1,189,420	316,297
2006	1,038,026	1,243,248	1,213,645	65,040	501,286	17,809	795,182	148,089	1,287,074	342,266
2007	666,215	820,799	1,036,396	41,723	354,543	11,413	520,847	95,550	825,932	219,727
2008	999,433	1,167,531	1,157,440	61,924	478,719	17,175	757,686	144,009	1,367,672	325,069
2009	1,080,062	1,293,596	1,262,793	67,674	521,586	18,529	827,383	154,087	1,339,196	356,126
2010	1,033,467	1,237,788	1,283,384	64,754	524,108	17,731	824,481	147,438	1,281,421	340,762
2011	1,116,181	1,336,855	1,386,101	69,937	566,054	19,149	890,469	159,239	1,383,979	368,035
2012	1,852,845	1,555,482	1,822,656	114,240	889,871	31,340	1,242,300	262,799	2,248,384	597,709
2013	2,009,977	1,687,999	1,985,496	123,887	965,459	33,958	1,347,273	284,729	2,436,140	647,551
2014	2,126,185	1,785,592	2,100,289	131,050	1,021,278	35,921	1,425,167	301,191	2,576,987	684,990
2015	2,234,554	1,876,601	2,207,337	137,729	1,073,331	37,752	1,497,805	316,542	2,708,332	719,903
2016	2,245,130	1,885,483	2,217,785	138,381	1,078,411	37,931	1,504,894	318,040	2,721,151	723,310
2017	2,213,984	1,859,326	2,187,018	136,461	1,063,450	37,405	1,484,017	313,628	2,683,401	713,275
2018	1,988,466	1,669,934	1,964,247	122,561	955,127	33,595	1,332,854	281,682	2,410,068	640,621
2019	2,097,575	1,761,564	2,072,027	129,286	1,007,535	35,438	1,405,989	297,138	2,542,310	675,772
2020	1,976,577	1,659,949	1,952,503	121,828	949,416	33,394	1,324,885	279,998	2,395,658	636,791
2021	1,969,342	1,653,874	1,945,356	121,382	945,941	33,271	1,320,036	278,973	2,386,890	634,460
2022	1,899,864	1,595,525	1,876,724	117,100	912,568	32,098	1,273,465	269,131	2,302,680	612,076
2023	1,903,651	1,598,705	1,880,465	117,333	914,387	32,162	1,276,003	269,667	2,307,270	613,296
2024	1,848,209	1,552,145	1,825,698	113,916	887,756	31,225	1,238,841	261,813	2,240,073	595,434
2025	1,689,904	1,419,198	1,669,321	104,159	811,717	28,550	1,132,730	239,388	2,048,204	544,434
2026	1,582,770	1,329,226	1,563,492	97,556	760,257	26,740	1,060,919	224,212	1,918,355	509,918
2027	1,729,391	1,452,360	1,708,328	106,593	830,684	29,218	1,159,198	244,982	2,096,063	557,155
2028	1,353,966	1,137,075	1,337,476	83,453	650,355	22,875	907,554	191,800	1,641,400	436,205
2029	1,459,937	1,226,070	1,442,155	89,985	701,256	24,665	978,585	206,812	1,769,478	470,345
2030	122,142	102,576	120,654	7,528	58,669	2,064	81,871	17,302	148,039	39,350
2031	122,454	102,838	120,962	7,548	58,819	2,069	82,080	17,347	148,417	39,451
2032	122,309	102,716	120,819	7,539	58,749	2,066	81,983	17,326	148,241	39,404
2033	122,441	102,827	120,949	7,547	58,812	2,069	82,071	17,345	148,401	39,447
2034	122,304	102,712	120,815	7,538	58,747	2,066	81,980	17,325	148,236	39,403
2035	122,351	102,752	120,861	7,541	58,769	2,067	82,011	17,332	148,293	39,418
TOTAL	51,844,149	46,403,071	44,274,837	3,222,288	23,759,483	884,348	35,179,238	7,297,862	63,640,036	16,863,538

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	24,019	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	42,040	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	38,023	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	59,122	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	80,131	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	84,371	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	85,698	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	101,792	10,539,433	90,436	12,943,057	16,957	2,119	3,704	22,780	0	18,013,188
1996	124,074	12,810,361	109,783	15,730,703	20,640	2,580	4,621	27,841	0	21,369,059
1997	28,259	13,168,230	112,960	16,102,652	21,382	2,674	4,872	28,928	0	21,970,359
1998	27,174	12,662,268	108,619	15,483,941	20,562	2,571	4,685	27,818	0	21,126,192
1999	53,545	17,454,651	149,123	21,587,353	28,348	3,543	6,765	38,656	0	29,200,538
2000	70,117	19,805,800	168,259	25,135,976	32,271	9,794	7,996	50,061	0	33,737,389
2001	69,001	19,490,499	165,580	24,751,444	31,757	9,638	7,869	49,264	0	33,419,720
2002	71,126	20,091,004	170,682	25,534,301	32,736	9,935	8,112	50,783	0	34,452,492
2003	74,063	20,920,403	177,728	26,588,412	34,087	10,345	8,446	52,878	0	35,874,763
2004	74,138	20,941,743	177,910	26,615,534	34,121	10,356	8,456	52,933	0	35,911,363
2005	69,992	19,770,593	167,960	25,127,082	32,213	9,776	7,983	49,972	0	33,903,044
2006	75,738	20,330,228	181,750	27,239,381	34,858	10,579	8,638	54,075	0	36,735,870
2007	45,192	12,752,863	116,415	17,507,615	22,362	7,007	5,579	34,948	0	23,537,874
2008	250,631	19,303,204	173,561	26,204,054	32,180	9,751	7,973	49,904	0	35,188,221
2009	78,805	21,153,536	189,110	28,342,483	36,270	11,008	8,988	56,266	0	38,172,245
2010	75,405	20,240,944	180,952	27,252,635	34,705	10,532	8,600	53,837	0	36,525,441
2011	81,440	21,860,932	195,434	29,433,805	37,482	11,375	9,289	58,146	0	39,448,763
2012	365,251	38,530,015	324,481	49,837,373	59,975	171,804	20,966	252,745	0	69,650,427
2013	395,709	39,971,232	351,635	52,241,045	64,961	186,087	23,079	274,127	0	73,234,606
2014	418,587	42,282,199	371,965	55,261,401	68,717	196,846	24,413	289,976	0	77,468,722
2015	439,922	44,437,258	390,924	58,077,990	72,219	206,879	25,658	304,756	0	81,417,183
2016	442,004	44,647,579	392,774	58,352,873	72,561	207,858	25,779	306,198	0	81,802,531
2017	435,872	44,028,192	387,325	57,543,354	71,554	204,974	25,421	301,949	0	80,667,698
2018	391,474	39,543,460	347,872	51,681,961	64,266	184,095	22,832	271,193	0	72,450,848
2019	412,955	41,713,235	366,960	54,517,784	67,792	194,197	24,085	286,074	0	76,426,276
2020	389,133	39,307,025	345,792	51,372,949	63,882	182,995	22,695	269,572	0	72,017,658
2021	387,709	39,163,154	344,526	51,184,914	63,648	182,325	22,612	268,585	0	71,754,059
2022	374,031	37,781,477	332,371	49,379,110	61,402	175,893	21,815	259,110	0	69,222,574
2023	374,776	37,856,786	333,034	49,477,535	61,525	176,243	21,858	259,626	0	69,360,553
2024	363,861	36,754,246	323,335	48,036,552	59,733	171,110	21,222	252,065	0	67,340,497
2025	332,695	33,606,124	295,640	43,922,064	54,616	156,454	19,404	230,474	0	61,572,562
2026	311,604	31,475,611	276,897	41,137,557	51,154	146,535	18,174	215,863	0	57,669,077
2027	340,469	34,391,384	302,548	44,948,373	55,893	160,110	19,857	235,860	0	63,011,306
2028	266,559	26,925,536	236,869	35,190,763	43,759	125,352	15,547	184,658	0	49,332,504
2029	287,421	29,032,908	255,408	37,945,025	47,184	135,163	16,763	199,110	0	53,193,594
2030	24,046	2,428,968	21,368	3,174,577	3,948	11,308	1,402	16,658	0	4,450,312
2031	24,108	2,435,170	21,423	3,182,686	3,958	11,337	1,406	16,701	0	4,461,676
2032	24,079	2,432,282	21,397	3,178,910	3,953	11,324	1,404	16,681	0	4,456,387
2033	24,105	2,434,908	21,420	3,182,342	3,957	11,336	1,406	16,699	0	4,461,196
2034	24,078	2,432,193	21,396	3,178,793	3,953	11,323	1,404	16,680	0	4,456,221
2035	24,088	2,433,129	21,405	3,180,017	3,954	11,327	1,405	16,686	0	4,457,938
TOTAL	8,658,432	1,043,115,971	9,113,363	1,354,256,616	1,687,999	3,375,309	537,702	5,601,010	0	1,876,553,642

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,231	13,756	36,029	49,785
1966	18,064	0	18,064	419,467	421,722	1,412,954	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	553,116	548,491	1,863,198	2,964,805	56,469	118,263	174,732
1968	128,628	0	128,628	683,002	633,184	2,178,465	3,494,650	115,960	229,807	345,767
1969	254,715	0	254,715	817,713	583,436	2,298,736	3,699,885	185,156	358,861	544,017
1970	277,547	0	277,547	904,070	640,297	2,787,966	4,332,334	200,150	387,675	587,826
1971	227,474	0	227,474	845,599	675,193	2,807,017	4,327,809	202,413	392,912	595,325
1972	224,978	0	224,978	929,719	822,397	3,027,749	4,779,864	209,057	406,589	615,646
1973	221,091	31,366	252,457	918,215	716,492	3,120,786	4,753,493	206,557	402,723	609,280
1974	240,498	32,938	273,437	956,855	746,933	3,325,022	5,028,809	208,545	407,090	615,636
1975	237,459	36,291	273,750	1,015,330	793,055	3,214,046	5,022,430	225,895	439,873	665,768
1976	271,292	40,836	312,127	1,128,428	943,464	3,362,542	5,434,433	228,976	447,299	676,276
1977	293,627	45,096	338,723	1,097,104	922,203	3,303,461	5,322,768	238,699	468,721	707,420
1978	273,870	49,178	323,048	1,185,967	935,819	3,712,581	5,834,367	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,282,607	1,009,566	3,819,533	6,111,707	243,110	483,437	726,547
1980	310,846	86,073	396,919	1,435,647	1,173,798	4,119,071	6,728,515	282,254	540,553	822,807
1981	347,781	112,848	460,629	1,544,254	1,349,125	4,507,566	7,400,945	307,065	596,670	903,736
1982	438,335	141,835	580,171	1,624,648	1,369,536	4,941,393	7,935,577	328,215	682,546	1,010,761
1983	354,787	163,294	518,081	1,495,012	1,260,138	4,910,241	7,665,391	357,218	702,083	1,059,301
1984	467,336	246,698	714,034	1,805,097	1,478,394	6,870,249	10,153,741	409,530	801,057	1,210,586
1985	736,074	386,306	1,122,380	2,303,007	2,225,097	7,796,485	12,324,588	500,696	969,931	1,470,627
1986	1,120,086	714,246	1,834,332	2,171,700	2,014,104	8,193,844	12,379,648	536,751	1,038,030	1,574,782
1987	1,773,801	1,582,227	3,356,028	2,668,289	2,505,662	7,980,255	13,154,206	570,645	1,148,974	1,719,618
1988	2,349,572	2,524,763	4,874,336	2,729,526	2,774,430	7,830,284	13,334,240	673,071	1,439,620	2,112,691
1989	2,548,764	3,701,384	6,250,149	2,713,537	2,515,471	7,578,849	12,807,857	772,571	1,814,759	2,587,330
1990	2,900,023	3,848,935	6,748,958	3,148,894	2,929,775	8,355,392	14,434,060	933,367	2,046,370	2,979,737
1991	2,941,321	4,170,227	7,111,548	2,420,826	2,384,246	6,430,834	11,235,906	979,709	2,366,841	3,346,550
1992	2,797,727	4,144,993	6,942,720	2,895,301	2,927,114	7,656,940	13,479,355	1,118,807	2,526,860	3,645,667
1993	2,855,497	4,172,491	7,027,989	3,752,077	2,977,354	8,849,995	15,579,426	1,185,666	2,726,057	3,911,723
1994	2,987,938	4,225,291	7,213,229	3,789,170	3,586,255	9,613,545	16,988,970	1,355,974	3,518,042	4,854,016
1995	2,961,322	4,405,219	7,366,541	4,037,808	3,313,352	8,393,827	15,744,987	1,647,816	6,195,416	7,843,232
1996	3,045,020	4,898,210	7,943,230	3,645,648	3,178,398	9,228,554	16,052,600	2,592,043	15,232,541	17,824,584
1997	3,028,005	4,734,808	7,762,812	3,872,157	3,145,550	9,338,015	16,355,722	3,002,833	23,737,163	26,739,996
1998	2,936,062	4,588,898	7,524,960	3,478,998	3,201,607	9,077,805	15,758,410	3,254,941	28,393,640	31,648,581
1999	3,164,190	5,083,795	8,247,984	4,203,019	3,692,801	11,435,485	19,331,304	3,811,208	29,671,335	33,482,543
2000	3,464,529	5,628,449	9,092,978	5,781,287	3,576,869	10,159,835	19,517,991	3,773,375	30,317,842	34,091,217
2001	4,097,061	6,433,922	10,530,983	9,826,078	4,084,939	11,636,233	25,547,250	4,327,112	32,480,910	36,808,023
2002	4,331,756	6,603,353	10,935,109	13,354,844	4,088,156	13,159,108	30,602,108	4,057,291	32,169,231	36,226,522
2003	4,458,386	6,952,204	11,410,590	10,026,179	3,821,866	11,987,633	25,835,679	4,144,082	32,501,211	36,645,293
2004	4,999,061	7,324,892	12,323,953	8,409,287	4,224,190	11,691,461	24,324,938	4,218,244	33,052,427	37,270,671
2005	4,342,204	6,789,908	11,132,112	8,422,790	4,337,751	12,359,232	25,119,773	4,322,474	33,052,684	37,375,157
2006	4,318,901	6,375,411	10,694,312	8,480,534	4,374,186	12,592,090	25,446,809	4,200,648	32,822,284	37,022,931
2007	4,488,200	6,862,804	11,351,005	9,359,386	4,809,107	13,615,953	27,784,085	4,284,910	33,607,662	37,892,572
2008	5,259,425	6,864,760	12,124,185	10,547,102	5,195,610	14,039,703	29,782,416	4,860,581	35,222,237	40,082,818
2009	5,826,734	7,075,532	12,902,267	9,679,818	4,913,357	14,254,130	28,847,305	4,780,192	33,978,753	38,758,944
2010	6,468,318	8,737,564	15,205,883	11,154,344	5,584,735	15,888,124	32,627,203	5,350,328	36,601,119	41,951,447
2011	7,003,648	9,289,088	16,292,736	12,881,048	6,486,770	18,384,750	37,752,569	5,567,411	38,131,495	43,698,906
2012	8,200,718	11,568,686	19,769,404	15,804,471	7,644,011	21,902,437	45,350,919	6,040,660	43,198,157	49,238,817
2013	8,373,749	10,736,661	19,110,410	15,433,660	7,834,772	20,896,943	44,165,375	7,139,339	40,155,215	47,294,554
2014	8,117,749	10,737,351	18,855,099	14,934,267	7,483,172	19,817,815	42,235,255	5,981,535	40,567,632	46,549,167
2015	7,712,280	10,418,132	18,130,412	14,514,801	7,101,855	18,707,663	40,324,319	5,932,134	40,326,850	46,258,984
2016	7,762,367	10,553,791	18,316,158	14,521,378	7,095,018	18,608,229	40,224,625	5,939,988	40,471,906	46,411,894
2017	7,743,961	10,583,867	18,327,828	14,561,715	7,045,410	18,434,775	40,041,900	5,904,796	40,486,451	46,391,247
2018	7,836,964	10,575,096	18,412,060	14,351,491	6,967,727	18,227,858	39,547,076	5,940,505	41,033,129	46,973,634
2019	7,845,087	10,661,401	18,506,488	14,327,734	6,969,226	18,222,417	39,519,377	5,952,743	41,274,790	47,227,533
2020	7,818,475	10,652,029	18,470,503	14,261,186	6,943,416	18,154,690	39,359,292	5,944,099	41,286,397	47,230,496
2021	7,837,152	10,693,527	18,530,679	14,297,245	6,961,765	18,201,297	39,460,306	5,957,700	41,452,644	47,410,343
2022	7,830,615	10,705,521	18,536,136	14,302,503	6,966,454	18,214,305	39,483,263	5,962,619	41,540,621	47,503,240
2023	7,846,040	10,710,917	18,556,957	14,314,525	6,972,778	18,231,424	39,518,727	5,973,222	41,594,481	47,567,703
2024	7,839,669	10,724,681	18,564,350	14,299,230	6,967,439	18,212,868	39,479,537	5,973,183	41,571,563	47,544,746
2025	7,787,788	10,691,105	18,478,892	14,206,568	6,927,911	18,105,365	39,239,844	5,952,105	41,408,782	47,360,886
2026	7,764,088	10,683,123	18,447,211	14,135,300	6,897,351	18,012,039	39,044,690	5,936,377	41,312,017	47,248,394
2027	7,831,942	10,782,197	18,614,140	14,308,165	6,976,002	18,235,163	39,519,330	5,992,029	41,608,095	47,600,124
2028	7,715,222	10,662,699	18,377,921	14,078,102	6,876,338	17,952,408	38,906,848	5,923,429	41,165,740	47,089,169
2029	7,767,858	10,745,112	18,512,970	14,175,955	6,920,344	18,073,135	39,169,434	5,959,497	41,372,447	47,331,944
2030	7,306,288	10,213,055	17,519,343	13,281,706	6,529,365	16,970,116	36,781,187	5,692,901	39,650,678	45,343,579
2031	7,310,888	10,235,501	17,546,389	13,343,750	6,558,521	17,058,209	36,960,480	5,714,642	39,736,203	45,450,845
2032	7,317,657	10,258,324	17,575,981	13,347,207	6,561,275	17,054,655	36,963,137	5,721,857	39,786,595	45,508,452
2033	7,305,949	10,255,182	17,561,131	13,407,018	6,590,471	17,141,255	37,138,744	5,746,279	39,896,052	45,642,331
2034	7,253,311	10,223,205	17,476,516	13,395,401	6,584,956	17,115,046	37,095,403	5,750,650	39,930,833	45,681,483
2035	7,125,908	10,122,074	17,247,982	13,450,434	6,611,112	17,199,368	37,260,914	5,776,580	40,045,445	45,822,025
TOTAL	287,374,730	393,352,708	680,727,438	528,294,891	283,794,519	794,108,357	1,606,197,766	223,909,189	1,516,105,620	1,740,014,809

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 2 of 4

SAN JOAQUIN VALLEY AREA									
Calendar Year	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricul-tural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,612	0	0	0	0	293,869
1968	226,004	19,413	54,589	445,438	1,712,817	16,947	19,712	308,090	2,803,010
1969	242,183	11,032	87,576	525,094	2,735,762	16,825	19,452	461,727	4,099,651
1970	307,405	34,468	94,674	573,999	3,887,088	21,435	30,476	523,443	5,472,988
1971	328,984	37,196	95,695	605,889	5,173,585	27,175	34,764	714,834	7,018,121
1972	382,813	40,457	98,789	631,615	7,149,909	28,473	63,973	1,992,118	10,386,146
1973	400,287	39,079	97,550	1,025,888	7,298,355	28,816	39,358	784,663	9,713,996
1974	509,488	40,293	98,460	1,143,571	8,019,684	29,544	42,666	1,046,798	10,930,504
1975	682,491	40,742	106,703	1,196,448	9,405,833	31,240	48,286	1,560,769	13,072,512
1976	721,396	43,263	108,083	1,323,177	10,653,662	32,667	52,235	1,445,211	14,379,694
1977	581,627	39,180	112,554	1,365,869	10,975,063	34,433	54,331	1,141,007	14,304,064
1978	700,307	36,029	115,521	1,564,175	13,305,070	38,928	59,153	1,175,222	16,994,404
1979	784,015	48,016	114,253	1,668,163	15,382,059	43,065	70,748	1,729,632	19,839,951
1980	965,128	49,751	125,950	1,770,264	17,040,284	48,021	95,112	1,675,899	21,770,409
1981	1,214,067	84,117	134,169	2,427,527	22,649,944	66,495	100,769	2,287,189	28,964,277
1982	1,250,183	70,311	135,057	2,516,846	25,052,899	70,662	108,421	2,282,118	31,486,498
1983	1,184,575	52,661	149,201	2,085,047	24,696,801	75,442	87,550	507,245	28,838,523
1984	1,494,205	28,643	164,505	3,352,673	33,474,481	94,321	121,570	1,544,530	40,274,927
1985	1,770,146	130,073	184,905	3,876,680	39,418,780	117,583	139,653	2,818,257	48,456,078
1986	2,012,124	79,450	180,445	4,079,838	43,496,352	136,715	153,315	3,658,958	53,797,197
1987	1,887,466	95,368	179,872	4,557,695	42,797,384	137,332	151,558	3,752,094	53,558,770
1988	1,972,581	109,746	193,735	4,704,495	44,754,521	138,278	146,723	3,906,812	55,926,890
1989	2,127,372	101,873	187,914	4,652,236	46,944,066	137,086	166,555	4,388,450	58,705,572
1990	1,885,279	87,077	221,391	4,799,306	45,726,662	121,153	148,861	3,966,913	56,956,642
1991	1,692,111	80,366	220,282	4,535,869	37,573,730	103,909	134,871	3,507,923	47,849,061
1992	2,238,072	105,185	241,456	5,540,058	48,780,935	143,784	175,854	4,546,753	61,772,096
1993	2,460,227	120,188	264,959	5,775,636	54,702,417	161,523	195,419	5,300,607	68,980,975
1994	2,265,050	107,693	306,359	5,200,566	52,152,275	145,626	178,231	4,673,307	65,029,107
1995	2,861,511	115,610	304,297	6,613,715	60,610,465	180,801	210,564	5,532,141	76,429,104
1996	2,053,828	125,300	389,202	6,666,563	58,686,663	178,474	190,176	7,097,906	75,388,112
1997	2,765,091	100,705	276,681	6,429,190	57,553,297	138,117	212,376	4,720,037	72,195,494
1998	2,610,771	119,997	381,846	5,733,156	54,035,440	143,434	203,985	4,973,337	68,201,966
1999	2,708,223	136,405	370,780	6,372,381	57,753,309	184,253	219,054	7,445,489	75,189,894
2000	2,577,555	120,312	304,447	6,088,083	50,955,156	173,041	212,402	6,112,172	66,543,168
2001	3,271,995	145,696	328,182	5,649,939	58,616,566	192,207	259,516	6,443,608	74,907,709
2002	2,987,824	127,766	320,888	6,167,757	53,551,260	187,322	238,819	5,787,329	69,368,965
2003	3,044,394	131,904	342,637	6,544,923	56,215,226	202,558	238,355	6,082,155	72,802,151
2004	3,231,581	168,495	345,114	7,860,070	56,808,959	356,215	253,894	5,838,215	74,862,543
2005	3,781,234	176,651	355,918	6,999,912	67,201,696	688,842	250,340	6,659,674	86,114,467
2006	3,593,259	166,869	295,907	7,461,347	66,891,406	533,030	254,997	5,868,467	82,205,282
2007	3,394,522	158,748	332,864	7,096,386	61,119,724	519,858	252,522	5,825,668	78,700,292
2008	3,368,046	156,550	468,537	7,733,745	62,126,304	544,847	261,028	5,524,693	80,183,750
2009	3,275,867	154,883	433,836	6,918,667	61,013,223	523,420	262,110	5,465,869	78,047,876
2010	3,673,756	238,901	508,081	8,100,147	72,988,287	657,356	331,017	6,572,293	93,069,837
2011	4,592,077	220,566	500,161	9,738,228	91,406,140	744,897	358,877	6,958,842	114,519,788
2012	4,399,985	270,266	563,822	11,672,784	90,133,038	818,769	416,227	8,365,418	116,640,309
2013	4,747,137	257,706	569,989	12,755,334	94,227,546	841,126	437,271	8,247,445	122,083,554
2014	4,526,674	245,727	540,454	12,252,934	90,095,309	809,159	417,055	7,868,297	116,755,609
2015	4,198,158	236,949	571,074	11,707,769	87,450,208	782,112	402,633	7,618,664	112,967,567
2016	4,222,033	238,325	570,318	11,738,200	87,888,045	786,498	403,614	7,660,516	113,507,548
2017	4,183,262	236,082	560,660	11,493,899	87,396,047	779,559	399,742	7,591,154	112,640,406
2018	4,196,328	237,455	542,576	11,472,200	87,936,723	774,528	399,586	7,610,751	113,170,146
2019	4,198,306	237,259	538,763	11,377,078	87,881,024	773,275	400,451	7,615,231	113,021,387
2020	3,935,146	237,252	541,660	11,356,935	87,918,676	772,946	399,087	7,603,789	112,765,491
2021	3,933,789	237,201	545,308	11,320,989	87,899,567	772,683	399,173	7,601,708	112,710,417
2022	3,939,464	237,740	549,495	11,342,681	88,110,298	774,273	399,285	7,611,217	112,964,453
2023	3,939,140	237,722	553,849	11,342,091	88,206,051	774,193	398,787	7,611,113	113,062,946
2024	3,921,725	236,846	558,158	11,276,702	87,833,391	771,428	397,617	7,580,035	112,575,902
2025	3,893,523	235,609	562,470	11,214,649	87,381,257	767,454	394,565	7,528,535	111,978,063
2026	3,843,894	232,955	567,128	11,057,088	86,372,423	759,143	390,411	7,439,875	110,662,918
2027	3,916,460	236,891	571,460	11,271,302	87,971,240	771,416	396,220	7,570,445	112,705,434
2028	3,830,657	232,812	574,049	11,052,263	86,331,587	758,450	388,204	7,414,311	110,582,333
2029	3,855,085	233,991	578,808	11,103,581	86,855,745	762,136	390,416	7,459,317	111,239,079
2030	3,534,878	218,566	583,644	10,280,784	80,515,158	713,402	361,383	6,876,309	103,084,124
2031	3,574,375	220,930	587,233	10,404,202	81,500,951	720,360	363,968	6,946,530	104,318,549
2032	3,540,969	218,951	592,451	10,270,016	80,719,544	714,268	361,888	6,887,979	103,306,065
2033	3,576,149	221,060	597,393	10,403,588	81,679,707	720,705	363,635	6,950,583	104,512,820
2034	3,537,731	218,785	602,109	10,235,797	80,744,209	713,525	361,507	6,883,188	103,296,851
2035	3,586,396	221,696	606,766	10,429,369	82,106,543	722,355	363,715	6,969,620	105,006,460
TOTAL	181,108,384	9,935,804	24,010,708	459,429,012	3,794,787,846	26,547,911	16,256,088	344,120,693	4,856,196,448

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley - East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	33,853	0	0	0	726	0	0	0	51,729	0
1964	63,658	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	119,982	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,068	35,344
1966	218,279	101,265	62,476	12,478	76,887	3,753	94,978	27,679	232,502	61,465
1967	422,318	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	744,780	491,459	218,649	41,509	265,168	12,870	328,574	95,466	782,164	208,926
1969	1,073,827	742,628	334,105	61,226	394,024	18,694	487,928	138,064	1,205,834	321,755
1970	1,397,955	942,717	470,423	89,700	552,224	25,231	674,168	184,837	1,778,188	467,573
1971	1,732,348	1,137,313	627,330	128,360	754,065	31,837	908,924	231,280	2,538,219	659,415
1972	2,214,025	1,382,676	819,636	179,685	1,035,805	43,430	1,236,488	287,620	3,741,483	950,298
1973	2,367,034	1,431,249	965,167	190,549	1,254,443	45,891	1,330,358	313,446	3,974,200	961,024
1974	2,487,454	1,526,873	993,984	203,642	1,298,337	48,770	1,390,261	331,702	4,448,225	1,104,491
1975	2,704,442	1,618,106	1,044,902	218,978	1,377,169	53,125	1,477,745	355,269	4,631,803	1,208,047
1976	3,165,926	1,654,898	1,103,708	231,759	1,469,992	57,620	1,554,771	381,276	4,831,375	1,278,740
1977	3,148,239	1,742,902	1,008,676	244,149	1,317,096	54,160	1,642,783	406,620	5,061,166	1,336,313
1978	3,591,988	1,876,142	1,205,609	255,071	1,613,049	56,760	1,690,733	420,026	5,090,095	1,374,032
1979	4,261,888	1,956,114	1,292,485	267,367	1,735,593	60,255	1,865,498	449,757	5,136,830	1,342,135
1980	4,959,457	2,094,674	1,406,781	295,350	1,941,392	67,605	2,039,652	499,051	5,647,604	1,485,141
1981	5,787,459	2,564,231	1,574,217	328,817	2,194,095	100,752	2,361,445	603,265	6,461,840	1,688,324
1982	5,546,215	2,727,461	1,657,630	346,721	2,336,914	82,296	2,335,445	641,991	6,752,799	1,929,664
1983	6,296,675	2,798,264	2,181,786	380,839	3,172,326	88,384	2,532,564	658,614	6,964,704	1,808,748
1984	7,672,136	3,877,125	3,287,287	497,585	4,929,764	96,492	2,799,545	727,821	8,053,210	2,598,233
1985	9,503,142	4,343,380	4,122,839	601,928	6,265,166	103,706	2,990,391	959,658	8,893,341	2,686,799
1986	9,471,399	4,978,991	4,584,188	647,634	7,009,695	130,221	3,174,570	1,223,847	9,142,822	3,398,539
1987	9,505,642	4,836,660	4,452,839	678,085	6,885,936	240,872	3,229,658	1,255,052	10,544,337	3,398,921
1988	9,104,353	5,023,582	4,510,361	704,411	7,052,631	158,845	3,404,339	1,044,206	11,095,193	3,271,137
1989	10,994,817	5,033,034	4,218,204	691,191	6,635,388	210,634	3,485,563	1,746,763	10,811,989	3,453,680
1990	12,386,724	5,501,193	4,916,384	729,229	7,720,886	331,172	3,718,368	1,953,904	11,722,940	4,221,266
1991	9,247,253	4,614,956	3,471,782	688,866	5,335,009	221,166	4,578,380	1,640,084	11,104,873	3,642,611
1992	11,804,200	5,803,644	3,626,100	612,895	5,587,382	174,998	5,556,843	1,532,325	11,144,101	3,694,099
1993	12,217,825	5,450,308	3,830,889	617,198	5,922,476	211,904	5,448,176	1,753,971	12,107,175	4,042,324
1994	14,286,862	6,016,768	3,857,908	694,421	5,963,596	278,012	6,399,625	2,090,724	12,731,704	4,776,753
1995	14,153,258	6,392,415	4,680,552	661,812	7,318,574	212,244	5,592,422	1,952,494	12,204,445	4,480,934
1996	14,579,793	6,623,557	7,634,303	710,651	12,187,479	208,357	5,690,566	2,300,206	12,730,932	4,599,073
1997	15,149,537	6,517,212	7,251,238	750,419	8,515,792	207,887	6,113,109	2,342,198	14,400,157	4,897,486
1998	13,665,233	6,140,018	6,324,675	717,140	7,018,227	209,057	7,715,940	1,946,444	14,309,133	4,177,167
1999	15,525,094	6,743,145	5,380,492	827,699	7,211,048	215,823	8,389,732	2,370,069	15,818,133	5,138,347
2000	14,536,490	10,156,450	3,673,313	790,459	5,416,210	186,995	8,246,568	2,051,813	15,497,257	4,210,071
2001	24,831,528	15,874,966	4,866,655	996,354	7,613,102	199,143	8,961,921	3,991,613	21,496,123	4,398,505
2002	16,357,068	13,153,608	4,134,636	961,617	6,405,381	182,371	8,138,470	3,395,003	22,474,649	5,806,756
2003	17,747,069	14,254,175	4,267,412	935,554	6,622,648	188,360	9,831,097	2,935,741	20,969,205	5,995,999
2004	18,927,866	15,531,416	4,951,697	1,048,330	6,747,049	202,487	10,116,551	3,222,656	25,529,691	5,500,017
2005	19,207,242	14,452,901	18,629,740	864,936	11,621,146	190,266	9,821,937	3,254,260	23,417,804	5,718,974
2006	20,939,114	13,869,352	31,880,085	857,461	11,765,398	202,427	12,689,805	3,217,345	23,383,690	5,806,175
2007	24,116,467	16,840,024	30,547,770	1,083,564	11,109,231	201,000	16,249,108	4,710,730	29,188,832	4,852,805
2008	22,066,816	19,165,806	30,342,430	1,034,183	12,206,222	217,289	14,882,573	4,696,126	29,929,720	5,944,399
2009	20,046,353	17,021,172	28,034,770	1,022,446	10,093,383	222,038	14,621,591	4,430,007	29,602,465	6,445,637
2010	23,968,684	17,633,837	38,490,273	980,479	13,662,916	228,354	17,956,498	3,989,742	33,034,690	8,243,030
2011	31,017,846	17,751,245	40,676,911	1,024,685	14,904,689	251,885	11,884,625	4,055,287	30,879,732	9,108,123
2012	29,573,481	23,066,092	47,537,449	1,549,548	20,192,842	563,541	13,403,210	5,630,981	43,873,667	9,589,055
2013	34,497,882	22,357,257	45,144,867	1,874,034	17,099,276	568,109	21,207,329	5,229,604	41,261,157	8,610,908
2014	31,980,895	21,675,237	44,648,886	1,424,464	16,602,652	573,190	24,140,838	5,194,941	40,187,194	9,308,178
2015	28,844,670	20,403,670	43,326,322	1,412,507	15,473,688	508,850	22,032,641	4,591,779	37,945,287	7,867,376
2016	30,169,596	20,815,341	45,325,389	1,448,953	16,014,420	527,080	23,264,227	4,761,379	38,741,149	8,023,810
2017	29,759,605	20,425,869	44,638,112	1,440,373	15,728,575	513,717	22,710,066	4,641,699	38,215,918	8,528,583
2018	31,551,720	20,800,961	46,624,321	1,469,109	16,510,142	545,436	24,093,649	4,942,584	39,560,786	8,871,483
2019	30,002,381	20,012,017	44,758,877	1,425,789	15,776,762	518,034	22,887,154	4,691,085	38,187,361	8,509,858
2020	30,543,162	20,092,207	45,174,670	1,417,282	15,942,263	526,821	23,702,950	4,779,904	38,317,192	8,542,695
2021	29,888,228	19,796,900	44,194,218	1,376,457	15,560,013	514,506	23,200,219	4,672,091	37,409,324	8,310,136
2022	30,315,338	19,765,187	43,940,552	1,372,142	15,605,525	521,995	23,439,767	4,743,757	37,474,025	8,329,805
2023	30,428,437	19,941,184	43,564,895	1,377,195	15,611,259	523,956	23,609,972	4,762,230	37,609,562	8,361,843
2024	29,745,328	19,507,739	42,638,894	1,356,833	15,246,738	511,962	23,033,019	4,651,529	36,920,624	8,181,853
2025	29,992,654	19,605,178	42,986,657	1,357,587	15,378,814	516,467	23,269,943	4,695,234	37,133,469	8,232,471
2026	28,838,657	19,160,992	41,645,390	1,326,524	14,836,575	496,243	22,429,647	4,509,223	36,114,390	7,963,035
2027	30,208,903	19,673,633	43,097,290	1,365,386	15,437,742	520,268	23,383,284	4,729,090	37,297,486	8,267,894
2028	29,854,746	19,430,327	42,763,793	1,345,633	15,269,502	514,309	23,188,336	4,679,084	36,896,447	8,157,437
2029	29,715,534	19,410,060	42,744,186	1,350,238	15,266,937	511,808	23,091,778	4,653,960	36,963,617	8,172,243
2030	28,082,208	18,136,840	41,129,978	1,263,220	14,501,166	484,024	21,976,663	4,416,106	35,153,425	7,688,557
2031	29,497,703	18,511,407	42,695,365	1,296,731	15,129,475	509,014	23,042,595	4,648,011	36,343,095	7,993,292
2032	27,710,114	17,881,371	40,801,789	1,258,313	14,360,918	477,528	21,714,043	4,356,174	34,966,113	7,632,246
2033	29,381,040	18,500,378	42,678,228	1,299,891	15,109,434	507,091	23,038,616	4,630,979	36,376,438	7,994,134
2034	27,026,537	17,823,159	40,301,763	1,246,890	14,144,858	465,736	21,413,398	4,249,702	34,619,123	7,532,420
2035	29,836,529	18,140,148	43,245,585	1,307,929	15,324,278	515,306	23,321,563	4,711,037	36,816,679	8,098,788
TOTAL	1,212,812,959	775,614,335	1,379,395,919	59,305,496	628,869,515	18,980,937	786,501,898	190,465,667	1,466,584,166	351,647,954

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]		
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,120	0	0	0	0	12,626	1,627,467
1964	21,736	1,260,513	9,378	1,601,758	0	0	0	0	13,938	2,808,876
1965	21,866	2,180,589	17,766	2,717,874	0	0	405	405	28,937	4,812,829
1966	37,965	3,900,172	33,426	4,863,325	0	0	565	565	31,321	7,404,659
1967	71,283	7,693,703	68,155	9,554,331	0	0	562	562	47,718	13,077,590
1968	128,915	15,317,881	142,803	18,779,165	0	1,050	1,439	2,489	46,945	25,600,654
1969	198,763	23,153,063	215,209	28,345,119	0	1,225	4,120	5,345	52,963	37,001,696
1970	289,633	30,617,164	273,605	37,763,417	0	3,848	17,116	20,964	69,744	48,524,819
1971	409,327	39,958,997	342,425	49,459,840	0	4,546	19,187	23,733	55,532	61,707,835
1972	537,186	54,896,379	422,304	67,747,015	0	4,929	21,150	26,079	80,412	83,960,140
1973	587,964	59,450,095	435,655	73,307,671	0	7,059	21,778	28,837	54,219	88,719,954
1974	611,428	65,819,845	455,565	80,720,578	0	8,336	22,408	30,744	76,783	97,676,490
1975	644,621	71,630,821	478,404	87,443,430	0	9,416	23,523	32,939	84,547	106,595,375
1976	668,314	74,675,280	475,587	91,549,244	0	7,004	23,257	30,261	106,717	112,488,752
1977	696,515	73,158,031	507,063	90,323,713	0	16,917	24,059	40,976	98,618	111,136,282
1978	709,040	81,722,902	523,177	100,128,625	0	12,635	24,225	36,860	100,786	124,147,680
1979	712,866	83,375,703	526,405	102,982,897	0	16,575	28,352	44,927	119,352	130,168,198
1980	862,276	93,029,351	583,628	114,911,962	0	19,834	26,562	46,396	178,812	144,855,821
1981	946,961	112,171,492	672,540	137,455,437	0	21,682	34,563	56,245	185,347	175,426,616
1982	1,021,329	117,143,301	727,623	143,249,388	0	16,117	43,117	59,234	173,894	184,495,522
1983	1,076,279	118,991,007	854,263	147,804,453	0	15,202	29,410	44,612	220,926	186,151,286
1984	1,211,620	156,273,535	933,311	192,957,662	20,590	15,442	31,795	67,827	225,959	245,604,737
1985	1,287,789	195,493,271	993,651	238,245,060	24,050	16,976	32,405	73,431	340,322	302,032,486
1986	1,344,770	218,331,684	1,058,276	264,496,638	31,753	18,145	33,596	83,494	279,227	334,445,318
1987	1,379,614	204,859,482	1,056,318	252,323,415	37,071	17,794	33,384	88,249	345,116	324,545,402
1988	1,465,829	221,667,115	1,124,101	269,626,102	48,058	19,117	33,605	100,780	365,207	346,340,247
1989	1,505,481	230,328,277	1,232,379	280,347,400	61,184	20,809	37,188	119,181	422,329	361,239,816
1990	1,624,764	277,194,766	1,855,990	333,877,591	66,041	20,855	36,812	123,808	474,284	415,594,981
1991	1,720,879	221,887,061	1,549,955	269,702,875	180,212	22,526	42,200	244,938	214,683	339,705,561
1992	1,779,902	245,365,618	1,503,480	298,185,589	208,216	26,028	43,517	277,761	43,676	384,746,864
1993	1,943,337	219,238,180	1,551,252	274,335,017	209,613	26,203	47,588	283,404	599,571	370,718,105
1994	1,920,217	257,365,883	1,475,069	317,857,543	201,284	25,161	46,079	272,524	609,966	412,825,355
1995	1,982,808	225,863,371	1,568,401	287,063,729	216,944	27,118	50,021	294,083	534,971	395,276,648
1996	1,651,239	235,410,313	1,622,641	305,949,110	217,250	27,156	56,623	301,029	571,857	424,030,523
1997	1,758,607	245,453,566	1,777,266	315,134,474	236,300	29,847	59,915	326,062	428,638	438,943,198
1998	1,947,196	227,090,227	1,796,534	293,056,991	128,021	29,927	36,222	194,170	465,095	416,850,172
1999	2,270,989	256,781,237	1,882,059	328,553,867	254,675	31,834	40,585	327,094	587,326	465,720,013
2000	2,547,464	248,404,343	1,956,690	317,674,122	262,163	79,001	43,704	384,868	0	447,304,344
2001	3,486,275	442,321,436	2,261,753	541,299,374	261,699	93,471	45,056	400,226	0	689,493,565
2002	4,836,283	333,694,954	2,305,932	421,846,730	266,107	95,018	47,297	408,422	0	569,387,856
2003	6,134,743	362,979,709	2,331,786	455,193,998	262,547	93,638	68,957	425,142	0	602,312,353
2004	6,496,230	414,408,685	2,618,751	515,301,425	284,387	102,404	29,286	416,077	0	664,499,608
2005	6,764,144	384,815,511	2,084,622	500,843,483	280,033	727,066	28,810	1,035,909	0	661,620,902
2006	7,278,676	362,989,201	2,072,348	496,951,075	292,991	43,185	38,579	374,755	0	652,695,164
2007	7,905,928	440,343,070	2,545,652	589,694,183	291,100	40,957	46,246	378,303	0	745,800,439
2008	9,654,437	414,360,703	3,009,870	567,510,573	306,916	804,536	86,666	1,198,118	0	801,318,859
2009	9,661,345	379,085,517	2,862,339	523,149,062	328,896	855,850	91,096	1,275,842	0	882,981,295
2010	10,834,103	444,198,544	3,057,271	616,278,421	400,358	1,064,565	109,477	1,574,400	0	800,707,190
2011	11,752,803	495,277,608	3,114,240	671,699,681	451,483	1,197,315	121,911	1,770,709	0	885,734,389
2012	14,527,779	565,983,354	4,268,624	779,759,624	484,801	1,388,755	141,263	2,014,819	0	1,012,773,891
2013	13,338,487	545,710,224	4,574,122	761,473,555	509,721	1,460,139	152,272	2,122,132	0	996,249,580
2014	12,886,870	508,382,143	4,545,599	721,551,086	513,477	1,470,898	157,693	2,142,068	0	948,088,284
2015	12,587,609	471,319,951	4,165,873	670,480,223	516,979	1,480,931	163,136	2,161,046	0	890,322,550
2016	12,859,484	483,755,864	4,254,709	689,961,401	517,321	1,481,910	167,701	2,166,932	0	910,588,558
2017	12,671,061	473,837,354	4,155,852	677,266,966	516,314	1,479,026	167,388	2,162,728	0	896,831,074
2018	12,857,481	488,962,047	4,249,933	701,039,653	509,026	1,458,147	164,840	2,132,013	0	921,274,582
2019	12,660,816	467,526,636	4,063,618	671,020,387	512,552	1,468,249	163,510	2,144,311	0	891,439,483
2020	12,685,207	469,912,879	4,081,350	675,718,581	508,642	1,457,047	150,237	2,115,926	0	895,660,289
2021	12,562,693	459,418,730	4,004,816	660,908,331	508,408	1,456,377	149,373	2,114,158	0	881,134,235
2022	12,581,146	458,903,008	3,999,996	660,992,236	506,162	1,449,945	147,240	2,103,347	0	881,582,676
2023	12,606,860	461,362,025	4,033,872	663,793,282	506,285	1,450,295	147,302	2,103,882	0	884,603,497
2024	12,513,429	449,718,600	3,934,563	647,961,112	504,493	1,445,162	146,684	2,096,339	0	868,221,985
2025	12,545,522	452,311,052	3,956,139	651,981,187	499,376	1,430,506	144,883	2,074,765	0	871,113,638
2026	12,403,991	438,030,987	3,850,240	631,605,895	495,914	1,420,587	143,671	2,060,172	0	849,069,280
2027	12,595,357	453,860,645	3,969,066	654,406,044	500,653	1,434,162	145,372	2,080,187	0	874,925,258
2028	12,541,007	447,131,289	3,915,594	645,687,506	488,519	1,399,404	141,081	2,029,004	0	862,672,781
2029	12,565,540	446,966,579	3,906,280	645,318,758	491,944	1,409,215	142,315	2,043,474	0	863,615,660
2030	12,285,795	416,224,883	3,634,112	604,976,978	448,708	1,285,360	126,974	1,861,042	0	809,566,252
2031	12,474,055	430,153,130	3,724,906	626,108,779	448,718	1,285,389	126,997	1,861,104	0	832,156,144
2032	12,283,487	410,134,340	3,570,218	597,146,653	448,713	1,285,376	127,014	1,861,103	0	802,361,391
2033	12,504,656	428,913,301	3,716,003	624,650,190	448,717	1,285,388	127,037	1,861,142	0	831,366,358
2034	12,255,646	405,449,961	3,543,258	590,072,451	448,713	1,285,375	127,055	1,861,143	0	795,483,848
2035	12,593,536	429,228,748	3,656,520	626,796,646	448,714	1,285,379	127,077	1,861,170	0	833,995,197
TOTAL	428,789,253	20,555,518,301	156,742,179	28,011,228,577	17,612,812	39,491,341	5,282,533	62,386,686	8,751,583	36,965,503,308

TABLE B-24 Equivalent Unit Charge for Water Supply for Each Contractor^a

(in dollars per acre-foot)

Project Service Area and Water Supply Contractor	Transportation Charge					Delta Water Charge	Water System Revenue Bond Surcharge	Total Equivalent Unit Charge
	Capital Cost Component	Minimum OMP&R Component	Off- Aqueduct Component	Variable OMP&R Component	Total			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
FEATHER RIVER AREA								
City of Yuba City	0.00	0.00	0.00	0.00	0.00	110.61	11.99	122.61
County of Butte	0.00	0.00	0.00	0.00	0.00	397.16	37.23	434.39
Plumas County Flood Control and Water Conservation District	34.40	4.22	0.00	0.00	38.63	57.22	7.81	103.67
Feather River Area	8.12	1.00	0.00	0.00	9.12	169.00	17.26	195.37
NORTH BAY AREA								
Napa County Flood Control and Water Conservation District	172.66	68.35	4.81	15.05	260.87	35.44	15.38	311.69
Solano County Water Agency	104.56	66.93	5.28	10.48	187.25	42.02	12.47	241.73
North Bay Area	130.11	67.46	5.11	12.19	214.87	39.55	13.56	267.98
SOUTH BAY AREA								
Alameda County Flood Control and Water Conservation District, Zone 7	48.69	50.73	8.96	22.09	130.47	38.80	8.76	178.03
Alameda County Water District	29.92	31.72	7.52	14.28	83.44	28.57	4.79	116.79
Santa Clara Valley Water District	24.79	22.10	6.71	11.46	65.06	19.03	3.30	87.39
South Bay Area	29.70	28.54	7.23	13.73	79.19	23.95	4.47	107.62
SAN JOAQUIN VALLEY AREA								
County of Kings	6.14	8.35	3.75	8.05	26.28	31.50	3.62	61.41
Dudley Ridge Water District	5.44	5.66	3.33	4.89	19.32	19.35	2.18	40.85
Empire West Side Irrigation District	2.19	5.12	2.52	4.54	14.38	21.43	1.72	37.53
Kern County Water Agency	10.16	11.46	5.23	6.98	33.83	24.33	2.84	61.00
Oak Flat Water District	2.19	2.83	2.02	3.02	10.07	20.07	1.73	31.87
Tulare Lake Basin Water Storage District	5.62	5.75	3.25	4.75	19.38	20.21	2.19	41.79
San Joaquin Valley Area	9.34	10.47	4.89	6.61	31.32	23.63	2.73	57.68
CENTRAL COASTAL AREA								
San Luis Obispo County Flood Control and Water Conservation District	379.64	239.57	13.01	62.40	694.61	164.59	43.56	902.76
Santa Barbara County Flood Control and Water Conservation District	1089.16	253.45	20.20	106.09	1,468.90	88.51	72.04	1,629.45
Central Coastal Area	929.09	250.31	18.58	96.23	1,294.22	105.67	65.62	1,465.51
SOUTHERN CALIFORNIA AREA								
Antelope Valley-East Kern Water Agency	55.50	54.85	32.93	66.29	209.57	48.52	9.18	267.27
Castaic Lake Water Agency	60.78	59.51	25.85	36.33	182.47	42.65	12.16	237.28
Coachella Valley Water District	83.76	86.33	43.96	78.83	292.87	42.72	10.61	346.20
Crestline-Lake Arrowhead Water Agency	153.39	141.07	34.91	57.92	387.30	70.31	18.99	476.60
Desert Water Agency	52.51	53.07	52.20	45.96	203.74	28.68	6.95	239.37
Littlerock Creek Irrigation District	88.21	86.61	30.40	73.64	278.86	74.61	14.01	367.48
Mojave Water Agency	152.22	175.07	29.99	145.00	502.28	112.21	26.76	641.25
Palmdale Water District	65.86	68.37	43.59	94.08	271.89	64.33	11.17	347.39
San Bernardino Valley Municipal Water District	248.05	200.28	30.83	80.60	559.76	83.89	24.04	667.69
San Gabriel Valley Municipal Water District	123.00	116.19	48.26	48.92	336.37	53.97	14.79	405.13
San Geronio Pass Water Agency	1116.24	544.58	36.51	207.12	1,904.46	132.88	39.35	2,076.69
The Metropolitan Water District of Southern California	91.22	73.99	39.86	42.54	247.61	44.51	11.40	303.52
Ventura County Watershed Protection District	300.19	247.80	24.75	118.87	691.61	159.61	41.64	892.86
Southern California Area	93.92	78.07	39.27	47.57	258.83	46.44	11.79	317.06
ALL AREAS	55.08	44.49	20.86	26.36	146.79	34.79	7.43	189.00

(a) Hypothetical charges, which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charge and Delta Water Charge payments required under a water supply contract, considering interest at the Project Interest Rate, 4.610 percent per annum.

TABLE B-25 Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach^a

(in dollars per acre-foot)

Aqueduct Reach	Unit Costs of Reach (b)						Cumulative Unit Costs from the Delta					
	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
NBA												
1	34.80	12.41	12.43	2.46	1.09	63.19	34.80	12.41	12.43	2.46	1.09	63.19
2	37.04	13.21	5.43	0.00	0.00	55.68	71.84	25.62	17.86	2.46	1.09	118.87
3A	6.60	2.35	10.80	5.09	1.76	26.60	78.44	27.97	28.66	7.55	2.85	145.47
3B	42.46	15.15	24.42	3.73	3.91	89.67	114.30	40.77	42.28	6.19	5.00	208.54
SBA												
1	6.08	2.17	14.57	5.51	4.08	32.41	7.78	2.78	17.44	8.21	5.99	42.20
2	0.57	0.20	1.65	0.00	0.00	2.42	8.35	2.98	19.09	8.21	5.99	44.62
4	1.91	0.68	2.81	0.00	0.00	5.40	10.26	3.66	21.90	8.21	5.99	50.02
5	4.02	1.43	2.20	0.00	0.00	7.65	14.28	5.09	24.10	8.21	5.99	57.67
6	0.23	0.08	0.23	0.00	0.00	0.54	14.51	5.17	24.33	8.21	5.99	58.21
7	1.78	0.64	0.42	0.00	0.00	2.84	16.29	5.81	24.75	8.21	5.99	61.05
8	2.41	0.86	0.71	0.00	0.00	3.98	18.70	6.67	25.46	8.21	5.99	65.03
9	4.99	1.78	2.65	0.00	0.00	9.42	23.69	8.45	28.11	8.21	5.99	74.45
CA												
1	1.70	0.61	2.87	2.70	1.91	9.79	1.70	0.61	2.87	2.70	1.91	9.79
2A	1.08	0.39	0.57	0.00	0.00	2.04	2.78	1.00	3.44	2.70	1.91	11.83
2B	0.55	0.20	0.28	0.00	0.00	1.03	3.33	1.20	3.72	2.70	1.91	12.86
3	0.48	0.17	0.21	0.00	0.00	0.86	3.81	1.37	3.93	2.70	1.91	13.72
4	0.77	0.27	1.42	1.30	0.86	4.62	4.58	1.64	5.35	4.00	2.77	18.34
5	0.59	0.21	0.28	0.00	0.00	1.08	5.17	1.85	5.63	4.00	2.77	19.42
6	0.15	0.05	0.14	0.00	0.00	0.34	5.32	1.90	5.77	4.00	2.77	19.76
7	0.89	0.32	0.34	0.00	0.00	1.55	6.21	2.22	6.11	4.00	2.77	21.31
8C	0.02	0.01	0.06	0.00	0.00	0.09	6.23	2.23	6.17	4.00	2.77	21.40
8D	0.34	0.12	0.27	0.00	0.00	0.73	6.57	2.35	6.44	4.00	2.77	22.13
9	0.29	0.10	0.25	0.00	0.00	0.64	6.86	2.45	6.69	4.00	2.77	22.77
10A	0.30	0.11	0.33	0.00	0.00	0.74	7.16	2.56	7.02	4.00	2.77	23.51
11B	0.45	0.16	0.21	0.00	0.00	0.82	7.61	2.72	7.23	4.00	2.77	24.33
12D	0.42	0.15	0.19	0.00	0.00	0.76	8.03	2.87	7.42	4.00	2.77	25.09
12E	0.30	0.11	0.32	0.00	0.00	0.73	8.33	2.98	7.74	4.00	2.77	25.82
13B	0.64	0.23	0.37	0.00	0.00	1.24	8.97	3.21	8.11	4.00	2.77	27.06
14A	2.45	0.87	2.88	2.29	1.62	10.11	11.42	4.08	10.99	6.29	4.39	37.17
14B	0.38	0.14	0.35	0.00	0.00	0.87	11.80	4.22	11.34	6.29	4.39	38.04
14C	0.32	0.11	0.26	0.00	0.00	0.69	12.12	4.33	11.60	6.29	4.39	38.73
15A	1.82	0.65	3.00	2.80	1.76	10.03	13.94	4.98	14.60	9.09	6.15	48.76
16A	3.01	1.07	4.64	6.08	4.11	18.91	16.95	6.05	19.24	15.17	10.26	67.67
17E	10.14	3.62	13.05	21.29	15.19	63.29	27.09	9.67	32.29	36.46	25.45	130.96
17F	2.63	0.94	0.16	0.00	0.00	3.73	29.72	10.61	32.45	36.46	25.45	134.69
18A	2.36	0.84	1.57	0.00	-1.60	3.17	32.08	11.45	34.02	36.46	23.85	137.86
19	1.74	0.62	0.95	0.00	0.00	3.31	33.82	12.07	34.97	36.46	23.85	141.17
19C	1.90	0.68	0.00	0.00	0.00	2.58	35.72	12.75	34.97	36.46	23.85	143.75
20A	1.39	0.50	1.57	0.00	0.00	3.46	37.11	13.25	36.54	36.46	23.85	147.21
20B	1.68	0.60	1.03	0.00	0.00	3.31	38.79	13.85	37.57	0.00	23.85	114.06
21	0.85	0.30	0.72	0.00	0.00	1.87	39.64	14.15	38.29	0.00	23.85	115.93
22A	0.89	0.32	0.37	0.00	0.00	1.58	40.53	14.47	38.66	0.00	23.85	117.51
22B	8.69	3.10	10.10	6.35	5.01	33.25	49.22	17.57	48.76	6.35	28.86	150.76
23	2.39	0.85	0.70	0.00	-2.03	1.91	51.61	18.42	49.46	6.35	26.83	152.67
24	4.63	1.65	1.96	0.00	0.00	8.24	56.24	20.07	51.42	6.35	26.83	160.91
25	3.38	1.21	0.11	0.00	0.00	4.70	59.62	21.28	51.53	6.35	26.83	165.61
26A	3.69	1.32	6.54	0.00	-13.88	(2.33)	63.31	22.60	58.07	6.35	12.95	163.28
28G	6.88	2.45	2.47	0.00	0.00	11.80	70.19	25.05	60.54	6.35	12.95	175.08
28H	6.62	2.36	2.59	0.00	0.00	11.57	76.81	27.41	63.13	6.35	12.95	186.65
28J	74.24	26.49	36.08	0.00	0.00	136.81	151.05	53.90	99.21	6.35	12.95	323.46
EBX												
1	N/A	0.00	0.52	0.00	0.00	0.52	N/A	22.60	58.59	6.35	12.95	100.49
2A	N/A	0.00	1.82	0.00	0.00	1.82	N/A	22.60	60.41	6.35	12.95	102.31
2B	N/A	0.00	82.50	7.37	28.80	118.67	N/A	22.60	142.91	13.72	41.75	220.98
2C	N/A	0.00	0.65	0.00	0.00	0.65	N/A	22.60	143.56	13.72	41.75	221.63
2D	N/A	0.00	0.00	0.00	0.00	0.00	N/A	22.60	143.56	13.72	41.75	221.63
2E	N/A	0.00	0.00	0.00	0.00	0.00	N/A	22.60	143.56	13.72	41.75	221.63
3A	N/A	0.00	93.18	8.88	37.43	139.49	N/A	22.60	236.74	22.60	79.18	361.13
3B	N/A	0.00	3.14	0.00	0.00	3.14	N/A	22.60	239.89	22.60	79.18	364.27
4A	N/A	0.00	15.84	0.00	0.00	15.84	N/A	22.60	255.73	22.60	79.18	380.11
4B	N/A	0.00	47.54	1.05	2.15	50.75	N/A	22.60	303.27	23.65	81.33	430.86
WB												
29A	3.44	1.23	7.49	2.85	1.78	16.79	33.16	11.84	39.94	39.31	27.23	151.48
29F	2.51	0.90	0.90	0.00	0.00	4.31	35.67	12.74	40.84	39.31	27.23	155.79
29G	8.34	2.98	4.26	0.00	-6.42	9.16	44.01	15.72	45.10	39.31	20.81	164.95
29H	5.20	1.86	4.04	0.00	0.00	11.10	49.21	17.58	49.14	39.31	20.81	176.05
29J	8.71	3.11	1.16	0.00	-12.01	0.97	57.92	20.69	50.30	39.31	8.80	177.02
30	13.98	4.99	3.62	0.00	0.00	22.59	71.90	25.68	53.92	39.31	8.80	199.61
CB												
31A	6.32	2.25	17.10	2.09	1.53	29.29	12.89	4.60	23.54	6.09	4.30	51.42
33A	236.27	84.29	32.26	16.01	20.05	388.88	249.16	88.89	55.80	22.10	24.35	440.30
34	168.81	60.22	0.90	0.00	0.00	229.93	417.97	149.11	56.70	22.10	24.35	670.23
35	0.00	0.00	0.00	0.00	0.00	0.00	417.97	149.11	56.70	22.10	24.35	670.23

(a) Representative of transportation unit costs only; does not include a unit cost of conservation. The Delta Water Rate should be added to these values in order to approximate unit costs at canalside.

Includes surplus water prior to May 1, 1973.

(b) Hypothetical charges which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the Project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charges required under the water supply contract considering interest rate at the Project Interest Rate of 4.610 percent per annum.

(c) The Water System Revenue Bond Surcharge equivalent unit rate is calculated by multiplying Column 1 by the ratio of the 2013 WSRB surcharge to the sum of the Transportation Capital and the Capital component of the Delta Water Charge.

**TABLE B-26 Capital Costs of Each Aqueduct Reach
to be Reimbursed through the Capital Cost Component
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	117,000	0	0	0	0	0	0	0
1980	200,000	0	0	0	0	0	0	74,000
1981	135,000	0	0	0	0	0	0	385,000
1982	1,503,000	0	0	0	0	0	0	1,586,000
1983	2,260,000	0	0	0	0	0	0	2,965,000
1984	735,000	0	0	0	0	0	796,000	1,380,000
1985	93,000	435,000	75,000	544,000	859,000	703,000	970,000	146,000
1986	784,000	4,477,000	3,144,000	2,234,000	1,569,000	1,203,000	1,808,000	34,000
1987	11,000	951,000	1,076,000	666,000	399,000	47,000	16,421,000	43,000
1988	1,000	125,000	1,681,000	1,730,000	2,024,000	40,000	13,326,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,242,000	229,000
1990	1,000	577,000	903,000	735,000	928,000	194,000	20,131,000	887,000
1991	1,000	280,000	413,000	333,000	422,000	93,000	20,702,000	1,215,000
1992	0	40,000	41,000	39,000	35,000	13,000	9,599,000	3,719,000
1993	0	19,000	16,000	19,000	12,000	6,000	2,319,000	19,654,000
1994	0	2,000	3,000	2,000	4,000	3,000	803,000	3,173,000
1995	0	0	0	0	0	0	223,000	1,465,000
1996	0	0	0	0	0	0	6,014,000	478,000
1997	0	0	0	0	0	0	404,000	1,327,000
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
TOTAL	5,841,000	7,112,000	9,441,000	8,476,000	8,762,000	2,363,000	104,758,000	38,830,000

**TABLE B-26 Capital Costs of Each Aqueduct Reach
to be Reimbursed through the Capital Cost Component
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							GRAND TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Total	Reach 25	Reach 26A	Reach 26B	Total	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	117,000	0	0	0	0	117,000
1980	0	0	274,000	0	0	0	0	274,000
1981	0	0	520,000	0	0	0	0	520,000
1982	0	0	3,089,000	0	0	0	0	3,089,000
1983	0	0	5,225,000	0	0	0	0	5,225,000
1984	0	0	2,911,000	0	0	0	0	2,911,000
1985	0	0	3,825,000	0	528,000	89,000	617,000	4,442,000
1986	25,000	0	15,278,000	0	1,926,000	154,000	2,080,000	17,358,000
1987	178,000	0	19,792,000	0	3,699,000	437,000	4,136,000	23,928,000
1988	632,000	0	19,629,000	0	5,667,000	3,329,000	8,996,000	28,625,000
1989	1,130,000	0	19,641,000	0	40,879,000	1,650,000	42,529,000	62,170,000
1990	2,066,000	0	26,422,000	0	29,853,000	1,650,000	31,503,000	57,925,000
1991	4,980,000	0	28,439,000	0	26,027,000	999,000	27,026,000	55,465,000
1992	11,920,000	0	25,406,000	0	15,317,000	299,000	15,616,000	41,022,000
1993	16,303,000	0	38,348,000	0	4,878,000	0	4,878,000	43,226,000
1994	7,081,000	0	11,071,000	0	3,151,000	0	3,151,000	14,222,000
1995	5,350,000	0	7,038,000	0	2,137,000	0	2,137,000	9,175,000
1996	1,706,000	0	8,198,000	0	9,181,000	0	9,181,000	17,379,000
1997	1,905,000	0	3,636,000	0	175,000	0	175,000	3,811,000
1998	28,000	0	28,000	0	0	0	0	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
TOTAL	53,304,000	0	238,887,000	0	143,418,000	8,607,000	152,025,000	390,912,000

TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	1,048,625	0
1995	0	0	0	0	0	0	953,814	0
1996	0	0	0	0	0	0	1,171,411	0
1997	0	0	0	0	0	0	1,110,038	0
1998	0	0	0	0	0	0	1,213,002	0
1999	1,229	517	646	409	383	169	668,466	0
2000	4,452	1,875	2,340	1,484	1,386	614	1,324,201	0
2001	347	146	183	116	108	48	1,043,479	0
2002	1,639	690	861	546	510	226	1,537,631	0
2003	0	0	0	0	0	0	1,838,208	0
2004	2,132	27,868	18,579	18,731	10,355	8,528	1,503,239	0
2005	1,243	16,250	10,833	10,922	6,038	4,973	1,002,633	0
2006	4,632	60,550	40,367	40,697	22,499	18,529	1,497,992	0
2007	13,123	171,531	114,354	115,291	63,738	52,490	1,766,634	0
2008	28,340	370,451	246,967	248,992	137,654	113,362	2,844,766	0
2009	37,593	491,395	327,597	330,282	182,595	150,372	2,907,622	0
2010	8,932	116,755	77,837	78,475	43,385	35,728	1,990,480	0
2011	6,959	90,964	60,643	61,140	33,801	27,836	2,029,783	0
2012	0	0	0	0	0	0	2,300,807	0
2013	0	0	0	0	0	0	2,297,031	0
2014	0	0	0	0	0	0	1,991,561	0
2015	0	0	0	0	0	0	2,446,954	0
2016	0	0	0	0	0	0	2,446,954	0
2017	0	0	0	0	0	0	2,446,954	0
2018	0	0	0	0	0	0	2,446,954	0
2019	0	0	0	0	0	0	2,446,954	0
2020	0	0	0	0	0	0	2,446,954	0
2021	0	0	0	0	0	0	2,446,954	0
2022	0	0	0	0	0	0	2,446,954	0
2023	0	0	0	0	0	0	2,446,954	0
2024	0	0	0	0	0	0	2,446,954	0
2025	0	0	0	0	0	0	2,446,954	0
2026	0	0	0	0	0	0	2,446,954	0
2027	0	0	0	0	0	0	2,446,954	0
2028	0	0	0	0	0	0	2,446,954	0
2029	0	0	0	0	0	0	2,446,954	0
2030	0	0	0	0	0	0	2,446,954	0
2031	0	0	0	0	0	0	2,446,954	0
2032	0	0	0	0	0	0	2,446,954	0
2033	0	0	0	0	0	0	2,446,954	0
2034	0	0	0	0	0	0	2,446,954	0
2035	0	0	0	0	0	0	2,446,954	0
TOTAL	110,621	1,348,992	901,207	907,085	502,452	412,875	85,427,455	0

TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Subtotal	Reach 25	Reach 26A (a)	Reach 26B	Subtotal	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	1,048,625	0	1,713,260	0	1,713,260	2,761,885
1995	0	0	953,814	0	1,452,549	0	1,452,549	2,406,363
1996	0	0	1,171,411	0	1,350,581	0	1,350,581	2,521,992
1997	679,826	0	1,789,864	0	1,528,509	0	1,528,509	3,318,373
1998	825,038	0	2,038,040	0	1,619,068	0	1,619,068	3,657,108
1999	382,178	0	1,053,997	0	956,229	0	956,229	2,010,226
2000	736,527	0	2,072,879	0	1,416,309	0	1,416,309	3,489,188
2001	812,638	0	1,857,065	0	808,244	0	808,244	2,665,309
2002	728,857	0	2,270,960	0	1,138,792	0	1,138,792	3,409,752
2003	915,968	0	2,754,176	0	1,278,532	0	1,278,532	4,032,707
2004	933,016	0	2,522,448	0	1,853,926	0	1,853,926	4,376,374
2005	1,042,062	0	2,094,954	0	1,858,352	0	1,858,352	3,953,306
2006	831,436	0	2,516,702	0	1,722,964	0	1,722,964	4,239,666
2007	1,416,289	0	3,713,450	0	2,346,558	0	2,346,558	6,060,008
2008	1,058,617	0	5,049,149	0	2,709,455	0	2,709,455	7,758,604
2009	1,323,108	0	5,750,564	0	3,005,349	0	3,005,349	8,755,913
2010	1,281,554	0	3,633,146	0	2,563,076	0	2,563,076	6,196,222
2011	1,757,393	0	4,068,518	0	2,091,836	0	2,091,836	6,160,354
2012	1,806,337	0	4,107,143	0	2,667,430	0	2,667,430	6,774,573
2013	1,827,296	0	4,124,327	0	3,900,162	0	3,900,162	8,024,489
2014	1,779,870	0	3,771,431	0	2,672,173	0	2,672,173	6,443,603
2015	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2016	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2017	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2018	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2019	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2020	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2021	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2022	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2023	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2024	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2025	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2026	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2027	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2028	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2029	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2030	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2031	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2032	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2033	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2034	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
2035	1,423,421	0	3,870,375	0	3,030,331	0	3,030,331	6,900,706
TOTAL	50,029,852	0	139,640,539	0	104,290,304	0	104,290,304	243,930,842

(a) Units 3 and 4 at Devil Canyon Powerplant were operational in 1993.

**TABLE B-28 Capital Costs of East Branch Enlargement
Transportation Facilities Allocated to Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	11,731	1,010	10,566	466	0	93,227	117,000
1980	0	28,241	4,708	27,495	797	0	212,759	274,000
1981	0	56,134	16,676	61,271	538	0	385,381	520,000
1982	0	326,180	76,872	337,913	5,988	0	2,342,047	3,089,000
1983	0	554,658	138,964	582,070	9,004	0	3,940,304	5,225,000
1984	0	306,514	68,842	314,468	2,928	0	2,218,248	2,911,000
1985	49,675	447,266	65,773	347,262	4,514	21,614	3,505,896	4,442,000
1986	185,353	1,757,633	236,324	1,363,586	41,900	78,842	13,694,362	17,358,000
1987	49,735	2,455,279	378,535	1,774,447	10,615	151,421	19,107,968	23,928,000
1988	124,534	2,689,959	500,466	1,712,431	13,783	231,982	23,351,845	28,625,000
1989	155,446	7,118,094	2,423,000	1,671,088	17,419	1,673,409	49,111,544	62,170,000
1990	62,786	6,459,229	1,943,918	2,234,452	8,680	1,222,053	45,993,882	57,925,000
1991	28,686	6,265,822	1,875,066	2,168,712	4,024	1,065,433	44,057,257	55,465,000
1992	2,911	4,826,764	1,610,921	1,359,335	471	627,012	32,594,586	41,022,000
1993	1,205	5,094,237	1,828,410	2,722,156	212	199,684	33,380,096	43,226,000
1994	273	1,726,376	631,816	478,543	27	128,988	11,255,977	14,222,000
1995	0	1,130,963	423,243	206,978	0	87,480	7,326,336	9,175,000
1996	0	2,025,987	645,296	606,205	0	375,830	13,725,682	17,379,000
1997	0	451,011	154,366	205,796	0	7,164	2,992,663	3,811,000
1998	0	3,551	1,293	0	0	0	23,156	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
TOTAL	660,604	43,735,629	13,025,499	18,184,774	121,366	5,870,912	309,313,216	390,912,000

**TABLE B-29 Capital Cost Component of East Branch Enlargement
Facilities Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley - East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District (a)	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,628,706	782,890	1,092,986	7,295	0	18,591,099	23,142,681
1995	39,632	2,623,828	781,438	1,090,958	7,281	0	18,556,603	23,099,740
1996	39,825	2,636,667	785,261	1,096,296	7,317	0	18,647,406	23,212,772
1997	41,743	2,763,629	823,074	1,149,085	7,669	0	19,545,322	24,330,522
1998	42,642	2,823,126	840,793	1,173,824	7,834	0	19,966,108	24,854,327
1999	44,738	2,961,887	882,120	1,231,519	8,219	0	20,947,475	26,075,958
2000	49,031	3,246,109	966,768	1,349,695	9,008	0	22,957,586	28,578,197
2001	49,048	3,247,263	967,111	1,350,175	9,011	0	22,965,748	28,588,356
2002	47,894	3,170,848	944,353	1,318,402	8,799	0	22,425,318	27,915,614
2003	40,765	2,698,871	803,787	1,122,160	7,489	0	19,087,337	23,760,409
2004	44,199	2,926,222	871,498	1,216,690	8,120	0	20,695,237	25,761,966
2005	33,144	2,194,299	653,514	912,364	6,089	0	15,518,825	19,318,235
2006	46,979	3,110,276	926,313	1,293,217	8,631	0	21,996,926	27,382,342
2007	45,289	2,998,370	892,985	1,246,688	8,321	0	21,205,489	26,397,142
2008	42,491	2,813,118	837,813	1,169,662	7,806	0	19,895,327	24,766,217
2009	43,670	2,891,182	861,062	1,202,121	8,023	0	20,447,424	25,453,482
2010	44,839	2,968,619	884,125	1,234,318	8,238	0	20,995,083	26,135,222
2011	43,190	2,859,419	851,602	1,188,914	7,935	0	20,222,785	25,173,845
2012	65,203	4,402,540	1,322,519	1,794,868	11,979	0	31,062,958	38,660,067
2013	56,417	3,808,986	1,144,171	1,553,023	10,366	0	26,875,319	33,448,282
2014	60,709	4,090,990	1,227,874	1,671,176	11,153	0	28,871,589	35,933,491
2015	64,679	4,360,604	1,309,073	1,780,442	11,882	0	30,772,564	38,299,244
2016	63,527	4,273,132	1,281,543	1,748,724	11,672	0	30,163,491	37,542,089
2017	64,997	4,372,032	1,311,203	1,789,199	11,941	0	30,861,618	38,410,990
2018	63,840	4,290,803	1,286,409	1,757,316	11,728	0	30,291,025	37,701,121
2019	63,925	4,302,050	1,290,485	1,759,709	11,744	0	30,365,879	37,793,792
2020	62,625	4,206,801	1,260,913	1,723,895	11,505	0	29,700,030	36,965,769
2021	63,935	4,304,553	1,291,474	1,759,984	11,747	0	30,382,001	37,813,694
2022	61,495	4,143,398	1,243,531	1,692,817	11,298	0	29,241,934	36,394,473
2023	50,590	3,417,170	1,026,685	1,392,610	9,295	0	24,109,400	30,005,750
2024	53,217	3,591,673	1,078,733	1,464,925	9,777	0	25,343,051	31,541,376
2025	60,458	4,069,782	1,220,948	1,664,274	11,108	0	28,725,534	35,752,104
2026	23,825	1,625,979	490,688	655,831	4,377	0	11,457,883	14,258,583
2027	24,334	1,664,389	502,749	669,845	4,471	0	11,725,510	14,591,298
2028	15,583	1,069,657	323,581	428,990	2,864	0	7,532,578	9,373,253
2029	16,320	1,121,368	339,368	449,277	2,998	0	7,895,806	9,825,137
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
TOTAL	1,868,767	124,891,423	37,350,149	51,442,459	343,332	0	882,275,612	1,098,171,742

(a) Under Article 49(d)(4)(A) of its contract, San Bernardino Valley Municipal Water District elected to pay a portion of its allocated costs of East Branch Enlargement in advance rather than to participate in payment of Water System Revenue Bonds. This election made via a letter of agreement signed June 1, 1987. As of June 1999, \$6,347,938 has been received from the San Bernardino Valley Municipal Water District.

TABLE B-30 Minimum OMP&R Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	320,415	101,486	95,075	0	70,133	2,174,776	2,761,885
1995	0	278,176	86,604	86,479	0	59,461	1,895,643	2,406,363
1996	0	287,293	82,991	106,208	0	55,287	1,990,213	2,521,992
1997	0	389,636	123,446	100,643	0	62,571	2,642,077	3,318,373
1998	0	429,772	135,927	109,979	0	66,278	2,915,152	3,657,108
1999	37	236,006	75,040	60,907	11	39,144	1,599,081	2,010,226
2000	132	405,521	121,973	121,147	40	57,978	2,782,398	3,489,189
2001	10	309,546	90,165	94,693	3	33,086	2,137,804	2,665,307
2002	49	390,469	108,436	139,812	15	46,617	2,724,355	3,409,753
2003	0	461,535	127,179	166,664	0	52,338	3,224,991	4,032,707
2004	1,278	510,656	156,828	143,969	265	75,892	3,487,487	4,376,375
2005	745	471,092	157,458	95,381	154	76,073	3,152,404	3,953,307
2006	2,777	490,817	145,890	152,494	575	70,531	3,376,584	4,239,668
2007	7,866	704,163	211,776	207,415	1,630	96,058	4,831,100	6,060,008
2008	16,988	873,674	229,413	359,949	3,520	110,913	6,164,148	7,758,605
2009	22,534	987,630	261,312	398,956	4,669	123,026	6,957,786	8,755,913
2010	5,354	720,014	217,730	212,625	1,109	104,921	4,934,468	6,196,221
2011	4,171	717,329	213,949	209,085	864	85,631	4,929,324	6,160,353
2012	0	795,186	247,205	208,606	0	109,193	5,414,381	6,774,571
2013	0	952,056	314,623	208,264	0	159,656	6,389,889	8,024,488
2014	0	761,294	243,559	180,568	0	109,387	5,148,795	6,443,603
2015	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2016	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2017	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2018	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2019	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2020	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2021	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2022	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2023	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2024	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2025	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2026	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2027	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2028	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2029	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2030	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2031	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2032	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2033	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2034	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2035	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
TOTAL	61,941	28,436,151	8,710,613	8,117,916	12,855	4,269,203	194,322,162	243,930,841

**TABLE B-31 Total East Branch Enlargement Facilities
Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,949,121	884,376	1,188,061	7,295	70,133	20,765,875	25,904,566
1995	39,632	2,902,004	868,042	1,177,437	7,281	59,461	20,452,246	25,506,103
1996	39,825	2,923,960	868,252	1,202,504	7,317	55,287	20,637,619	25,734,764
1997	41,743	3,153,265	946,520	1,249,728	7,669	62,571	22,187,399	27,648,895
1998	42,642	3,252,898	976,720	1,283,803	7,834	66,278	22,881,260	28,511,435
1999	44,775	3,197,893	957,160	1,292,426	8,230	39,144	22,546,556	28,086,184
2000	49,163	3,651,630	1,088,741	1,470,842	9,048	57,978	25,739,984	32,067,386
2001	49,058	3,556,809	1,057,276	1,444,868	9,014	33,086	25,103,552	31,253,663
2002	47,943	3,561,317	1,052,789	1,458,214	8,814	46,617	25,149,673	31,325,367
2003	40,765	3,160,406	930,966	1,288,824	7,489	52,338	22,312,328	27,793,116
2004	45,477	3,436,878	1,028,326	1,360,659	8,385	75,892	24,182,724	30,138,341
2005	33,889	2,665,391	810,972	1,007,745	6,243	76,073	18,671,229	23,271,542
2006	49,756	3,601,093	1,072,203	1,445,711	9,206	70,531	25,373,510	31,622,010
2007	53,155	3,702,533	1,104,761	1,454,103	9,951	96,058	26,036,589	32,457,150
2008	59,479	3,686,792	1,067,226	1,529,611	11,326	110,913	26,059,475	32,524,822
2009	66,204	3,878,812	1,122,374	1,601,077	12,692	123,026	27,405,210	34,209,395
2010	50,193	3,688,633	1,101,855	1,446,943	9,347	104,921	25,929,551	32,331,443
2011	47,361	3,576,748	1,065,551	1,397,999	8,799	85,631	25,152,109	31,334,198
2012	65,203	5,197,726	1,569,724	2,003,474	11,979	109,193	36,477,339	45,434,638
2013	56,417	4,761,042	1,458,794	1,761,287	10,366	159,656	33,265,208	41,472,770
2014	60,709	4,852,284	1,471,433	1,851,744	11,153	109,387	34,020,384	42,377,094
2015	64,679	5,167,455	1,559,436	2,002,299	11,882	124,049	36,270,150	45,199,950
2016	63,527	5,079,983	1,531,906	1,970,581	11,672	124,049	35,661,077	44,442,795
2017	64,997	5,178,883	1,561,566	2,011,056	11,941	124,049	36,359,204	45,311,696
2018	63,840	5,097,654	1,536,772	1,979,173	11,728	124,049	35,788,611	44,601,827
2019	63,925	5,108,901	1,540,848	1,981,566	11,744	124,049	35,863,465	44,694,498
2020	62,625	5,013,652	1,511,276	1,945,752	11,505	124,049	35,197,616	43,866,475
2021	63,935	5,111,404	1,541,837	1,981,841	11,747	124,049	35,879,587	44,714,400
2022	61,495	4,950,249	1,493,894	1,914,674	11,298	124,049	34,739,520	43,295,179
2023	50,590	4,224,021	1,277,048	1,614,467	9,295	124,049	29,606,986	36,906,456
2024	53,217	4,398,524	1,329,096	1,686,782	9,777	124,049	30,840,637	38,442,082
2025	60,458	4,876,633	1,471,311	1,886,131	11,108	124,049	34,223,120	42,652,810
2026	23,825	2,432,830	741,051	877,688	4,377	124,049	16,955,469	21,159,289
2027	24,334	2,471,240	753,112	891,702	4,471	124,049	17,223,096	21,492,004
2028	15,583	1,876,508	573,944	650,847	2,864	124,049	13,030,164	16,273,959
2029	16,320	1,928,219	589,731	671,134	2,998	124,049	13,393,392	16,725,843
2030	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2031	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2032	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2033	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2034	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
2035	0	806,851	250,363	221,857	0	124,049	5,497,586	6,900,706
TOTAL	1,930,708	153,327,574	46,060,762	59,560,375	356,187	4,269,203	1,076,597,774	1,342,102,583

CONVERSION FACTORS

Quantity	To convert from customary unit	To metric units	Multiply customary unit by	To convert to customary unit, multiply metric unit by
Length	inches (in)	millimeters (mm)●	25.4	0.03937
	inches (in)	centimeters (cm)	2.54	0.3937
	feet (ft)	meters (m)	0.3048	3.2808
	miles (mi)	kilometers (km)	1.6093	0.62139
Area	square inches (in ²)	square millimeters (mm ²)	645.16	0.00155
	square feet (ft ²)	square meters (m ²)	0.092903	10.764
	acres (ac)	hectares (ha)	0.40469	2.4710
	square miles (mi ²)	square kilometers (km ²)	2.590	0.3861
Volume	gallons (gal)	liters (L)	3.7854	0.26417
	million gallons (10 ⁶ gal)	megaliters (ML)	3.7854	0.26417
	cubic feet (ft ³)	cubic meters (m ³)	0.028317	35.315
	cubic yards (yd ³)	cubic meters (m ³)	0.76455	1.308
	acre-feet (af)	thousand cubic meters (m ³ x 10 ³)	1.2335	0.8107
	acre-feet (af)	hectare-meters (ha - m)■	0.1234	8.107
	thousand acre-feet (taf)	million cubic meters (m ³ x 10 ⁶)	1.2335	0.8107
	thousand acre-feet (taf)	hectare-meters (ha - m)■	123.35	0.008107
	million acre-feet (maf)	billion cubic meters (m ³ x 10 ⁹)◆	1.2335	0.8107
	million acre-feet (maf)	cubic kilometers (km ³)	1.2335	0.8107
Flow	cubic feet per second (ft ³ /s)	cubic meters per second (m ³ /s)	0.028317	35.315
	gallons per minute (gal/min)	liters per minute (L/min)	3.7854	0.26417
	gallons per day (gal/day)	liters per day (L/day)	3.7854	0.26417
	million gallons per day (mgd)	megaliters per day (ML/day)	3.7854	0.26417
	acre-feet per day (af/day)	thousand cubic meters per day (m ³ x 10 ³ /day)	1.2335	0.8107
Mass	pounds (lb)	kilograms (kg)	0.45359	2.2046
	tons (short, 2,000 lb)	megagrams (Mg)	0.90718	1.1023
Velocity	feet per second (ft/s)	meters per second (m/s)	0.3048	3.2808
Power	horsepower (hp)	kilowatts (kW)	0.746	1.3405
Pressure	pounds per square inch (psi)	kilopascals (kPa)	6.8948	0.14505
	feet head of water	kilopascals (kPa)	2.989	0.32456
Specific capacity	gallons per minute per foot of drawdown	liters per minute per meter of drawdown	12.419	0.08052
Concentration	parts per million (ppm)	milligrams per liter (mg/L)	1.0	1.0
Electrical conductivity	micromhos per centimeter (μmhos/cm)	microsiemens per centimeter (μS/cm)	1.0	1.0
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	(°F - 32)/1.8	(1.8 x °C) + 32

● When using "dual units," inches are normally converted to millimeters (rather than centimeters).

■ Not used often in metric countries, but is offered as a conceptual equivalent of customary western U.S. practice (a standard depth of water over a given area of land).

◆ ASTM Manual E380 discourages the use of billion cubic meters since that magnitude is represented by giga (a thousand million) in other countries. It is shown here for potential use for quantifying large reservoir volumes (similar to million acre-feet).

OTHER COMMON CONVERSION FACTORS

1 cubic foot=7.48 gallons=62.4 pounds of water

1 cubic foot per second (cfs)=450 gallons per minute (gpm)

1 cfs=646,320 gallons per day=1.98 af a day

1 acre-foot=approximately 325,851 gallons=43,560 cubic feet

1 million gallons=3.07 acre-feet

1 million gallons per day (mgd)=1,120 af a year



STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

